

Final Report of IADC AI 23.3

Version 1.0

Date: 26 October 2011

Inter-Agency Space Debris Coordination Committee



IADC Action Item 23.3

**International 24-Hour LEO Space Debris
Measurement Campaign 2006**

Issued by Working Group 1 “Measurements”

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1 Introduction

The Inter-Agency Space Debris Coordination Committee (IADC) provides the forum for periodic international measurement campaigns of the space debris environment. The IADC has conducted two types of campaigns: 1) high altitude campaigns designed to measure the debris environment at near-geostationary altitudes using mostly optical telescopes, and 2) low altitude campaigns using primarily radars. One of the goals of the low altitude campaigns is to collect data for 24 contiguous hours. In this way, all orbit planes can be sampled. Multiple sensors are used, each with its own strengths and weaknesses, to provide a more complete understanding of the environment. Comparing results between sensors also provides a better understanding of the potential biases resulting from any one sensor. Conducting the campaigns at roughly regular intervals over a long period also allows researchers to examine trends and growth of the environment over time. For this reason, low altitude campaigns are anticipated at 2-year intervals. This is the 6th IADC low altitude campaign conducted. The first campaign was conducted in 1996 and two campaigns were conducted in 1999. The 2002 campaign was delayed due to scheduling conflicts until January 2003 and the fifth campaign was conducted in 2004.

This report covers the results obtained from the low altitude campaign conducted in 2006. The Objectives of Action Item 23.3, “International 24 Hour LEO Space Debris Measurement Campaign 2006” included:

- Update statistical characterization of the dynamic LEO debris population.
- Compare data collected over a common collection period.
- Encourage participation by organizations that may not have contributed in past campaigns.
- Concentrate on altitudes less than 2000 km.

The strategy of routinely measuring the LEO environment has been validated by events in 2007 and 2009. Significant on-orbit fragmentations occurred during those years. The 2006 campaign provides a good baseline to compare against later campaigns, which will show the effects on the environment from these major events.

Two different types of radars were used in the campaign: pencil-beam radars and phased array radars.

2 Pencil-Beam Radars

Four pencil-beam radars were used during the 2006 24-hour campaign: the TIRA radar sponsored by ESA and operated by FGAN (now Fraunhofer) Research Institute for High Frequency Physics and Radar Techniques (FHR), the Haystack and Haystack Auxiliary (HAX) radars sponsored by NASA and operated by the Massachusetts Institute of Technology’s Lincoln Laboratory (MIT/LL), and the European Incoherent Scatter Scientific Association (EISCAT) Svalbard Radar (ESR). In addition to the TIRA radar operated in a mono-static mode, it also operated in a bi-static mode with TIRA acting as

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the transmitter and the Effelsberg radio telescope operated by the Max-Planck Institute for Radioastronomy acting as a receiver. However, the Effelsberg data has not yet been processed and will not be included in this report.

2.1 TIRA radar

At FGAN in Wachtberg, Germany, in the FHR, the TIRA system (see Figure 1) was developed to support experimental radar research. TIRA consists of two monostatic coherent radars supported by one 34 m parabolic antenna: a narrow-band L-band tracking radar and a high resolution Ku-band imaging radar. Both radars may operate simultaneously on the same object. TIRA has participated in many beam park experiments dating back to 1993. The data processing of beam-park experiments is thoroughly described in Rosebrock et al. [1].

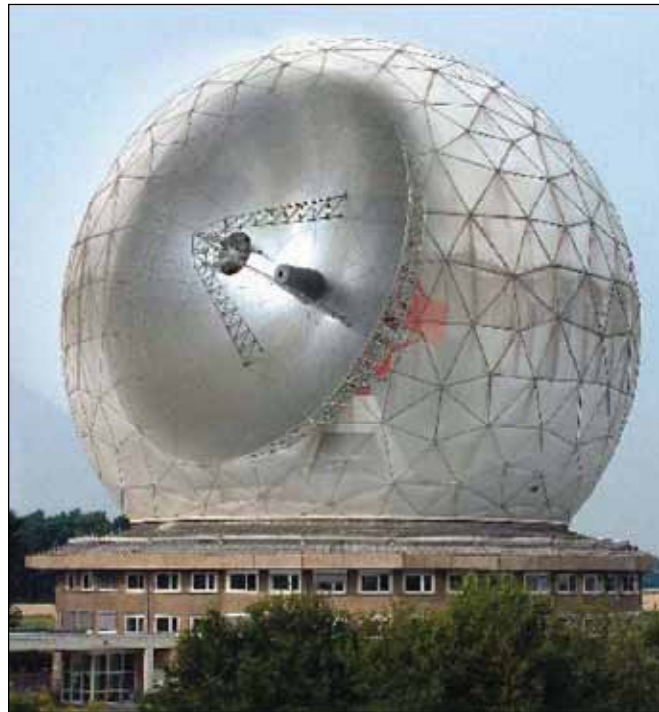


Figure 1. The TIRA System at Wachtberg, Germany.

The TIRA L-band radar was originally developed for the observation and characterization of individual objects in space. The principal observation volume in the tracking mode is given by the 3-dB beam width in angular extent (0.5°), the pulse length (typically 1 ms corresponds to 150 km for unmodulated pulses) in range extent, and by the Doppler filter width (typically 1 kHz corresponds to 0.1125 km/s) in range rate extent. In beam-park mode the radar is staring into a fixed direction (fixed azimuth and elevation angles). The echoes of the range interval 300 – 2000 km and Doppler-frequency shift (range rate) interval of ± 125 kHz (corresponding to ± 14.1 km/s) are recorded covering the most interesting LEO altitudes.

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From an individual object, echoes are only available for the short time it takes for the object to traverse the beam (up to a few seconds). In this setup the Earth's rotation moves the radar beam through a complete revolution in right ascension during 24 hours.

2.1.1 Experiment Setup

Since BPE-1/2000 all beam-park experiments at TIRA have been performed with virtually identical setup which is thoroughly described in Banka et al. [2]. Table 1 lists the instrument and campaign parameters for the 2006 campaign.

Table 1. TIRA Instrument Parameters

TIRA Instrument Parameters and Campaign Parameters		
Geocentric latitude of sensor	deg	50.62
Geocentric longitude of sensor	deg	7.13
Geodetic altitude of sensor	km	0.293
Wavelength	m	0.225
Beam width for incoherent integration	deg	0.49
Antenna constant (Gain)	dB	49.7
Transmitted power (peak)	kW	1500
Pulse period	ms	29
Pulse duration	ms	1
Desired false alarm time (Marcum)	s	36000
Number of independent threshold decisions per pulse		5667
Maximum number of pulses to integrate		89
Noise equivalent RCS (NRCS)	dBm ²	-47.5
Transmitted power for NRCS	kW	1500
Pulse duration for NRCS	ms	1
Range for NRCS	km	1000
Date and Time of campaign start	YY MM DD HH MM	04 09 20 12 00
Maximum range	km	2000.1
Minimum range	km	300.0
Azimuth of line-of-sight	deg	90
Elevation of line-of-sight	deg	75
Duration of campaign	hrs	24

2.1.2 Processing

In Figure 2, an overview of the processing is given. It starts with detecting possible object echoes in raw radar data by incoherent integration over several pulse records. This is only limited by a false alarm time of 10 h. Consecutive pulse records containing possible object echoes are grouped.

During reprocessing of these grouped data, range and Doppler-frequency shift are determined more precisely, and tracks of the detections are kept. For each object, time, signal amplitude, range, and Doppler-frequency values, as well as the monopulse angle offsets of consecutive echoes, are determined. The squared amplitudes lead to the RCS of the objects.

There is a problem of side lobe detections using radars for BPEs. The identification is difficult because, in many cases, the visual screening does not give any consistent clues

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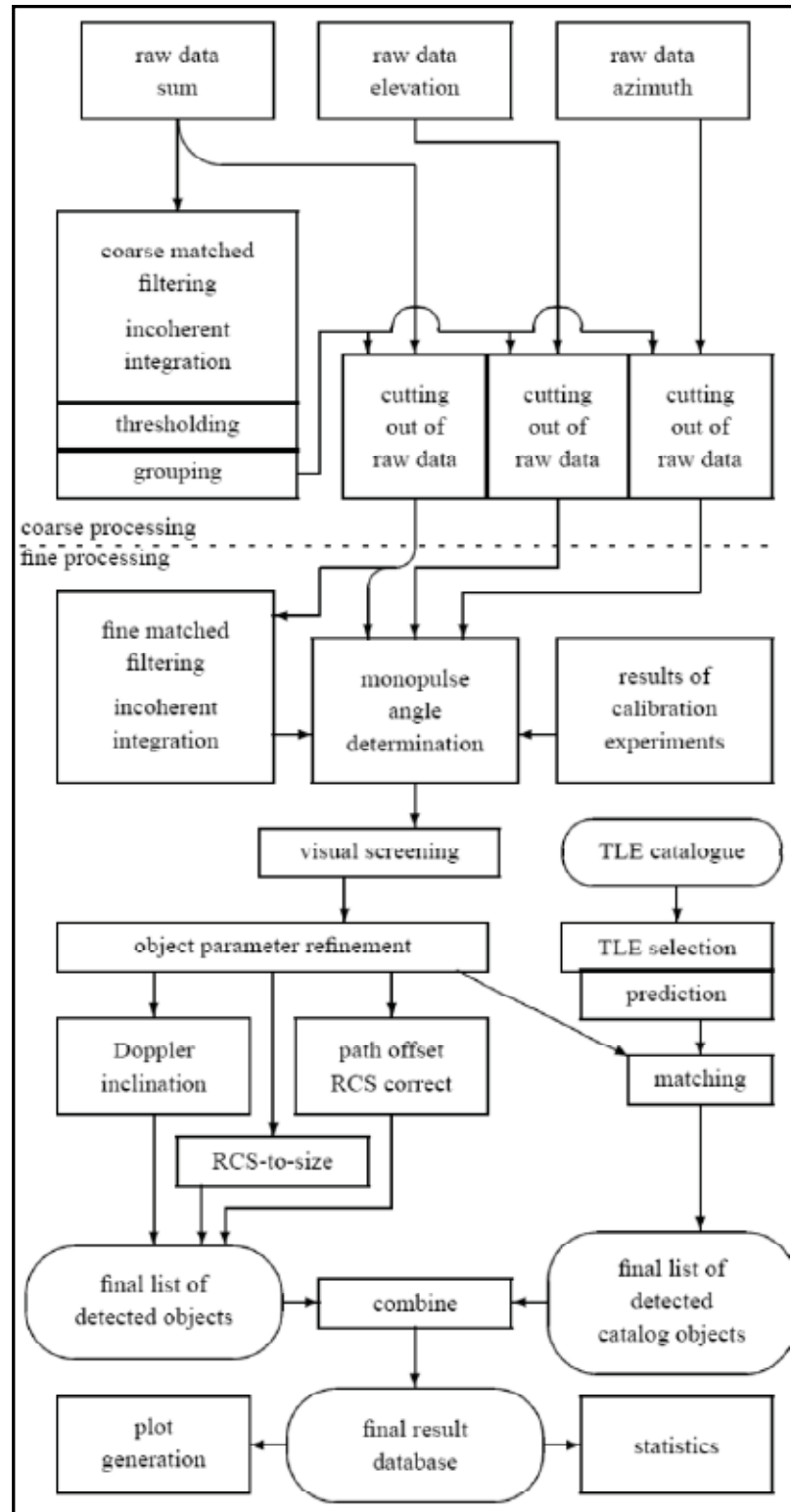


Figure 2. Processing flow chart.

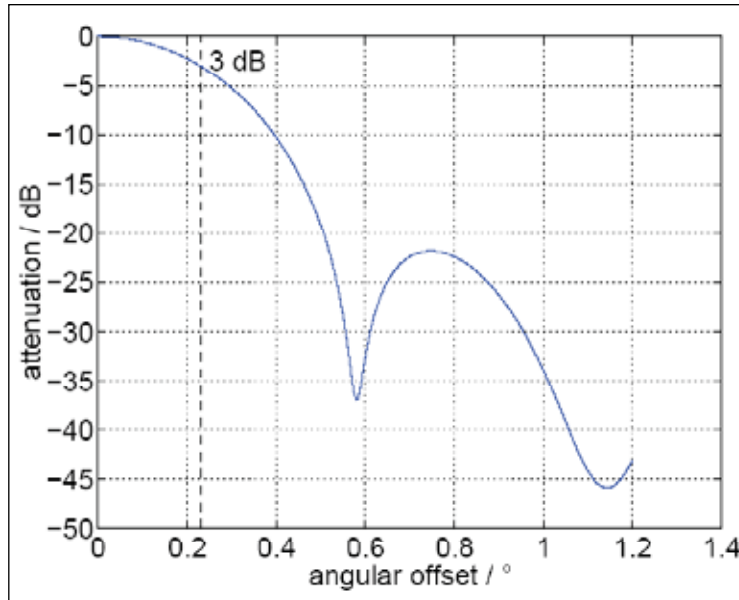


Figure 3. TIRA's L-band far field radiation pattern (one-way).

which would not be plausible for main lobe detections also. Consider TIRA's L-band far field pattern in Figure 3.

The 3-dB beam width of the 34 m parabolic antenna at L-band frequency is 0.5° , the corresponding angular offset is half of this value, namely 0.25° . The first null of the antenna radiation pattern appears at an angular offset of 0.6° , and the maximum of the first side lobe at 0.74° . The maximum of the first side lobe is about 22 dB below the main beam (one-way pattern). For reliable monopulse angle measurements the angular offset must be $<0.35^\circ$. Side lobe detections might happen when a larger space object (which is most likely catalogued) passes outside the main beam but crossing, e.g., the first side lobe. It would appear as a small object passing the main beam. However, the maximum signal-to-noise ratio (SNR) is not generated at CPA but when the object crosses, e.g., the maximum of TIRA's sidelobe several seconds before or after the time of closest approach (TCA), which is computed for the cross-check. Another hint for side lobe detections are look angle differences of more than 0.6° .

2.1.3 Doppler-Inclination

One of the steps shown in Figure 2 is determination of the Doppler offset of the returned signal. The Doppler is the frequency shift from the transmitted signal to the received signal caused by the line-of-sight relative motion of the target. The orbital inclination of an object detected by a monopulse radar operating in the staring mode can be measured from the time history of the position of the object through the beam determined from the open loop monopulse azimuth and elevation voltage ratios. The direction and angular velocity, along with the range, range rate, and time, are transformed into the classic orbital elements, including inclination. However, a relatively small amount of measurement noise quickly degrades velocity determination, and the derived values of inclination and eccentricity

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become invalid. Inclination can also be estimated from range rate information if circular orbits are assumed. Inclination derived by this method will be referred to as Doppler inclination.

If the assumption of a circular orbit is used, the line-of-sight velocity can be related to the orbital inclination of the object for an antenna beam that is not pointed vertically. An error is introduced, of course, if the orbit is non circular (i.e., $e \neq 0$). However, the error is not significant for modest eccentricities. In practice, the Doppler inclination has proved more accurate than determining inclination from the monopulse signals as the object passes through the main lobe of the radar beam. Figure 4 documents the differences between inclination determined from Doppler-frequency measurements (and CPA altitude with the assumption of circular orbits) and the catalogued TLE-inclination for the 94 catalogued objects detected during BPE-1/2000. A procedure to determine the Doppler-inclination is described in Leushacke et al. [3]. Figure 4 shows clearly the effect of the circular orbit assumption and the strong dependence of the differences on eccentricity. This occasionally leads to objects that seem to be outside the observable inclination interval ($50^\circ - 130^\circ$) determined by TIRA's latitude and the azimuth angle.

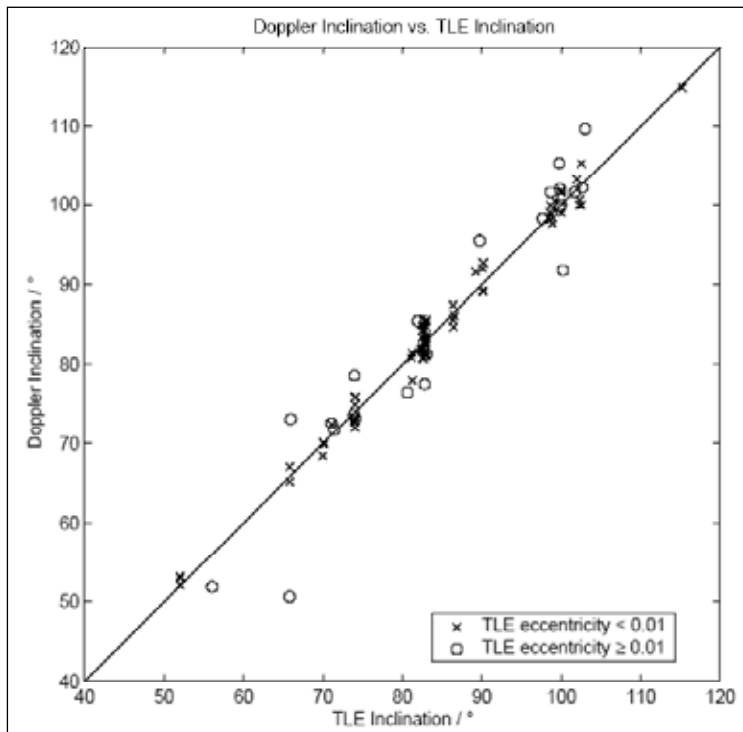


Figure 4. Distribution of Doppler-inclination vs. TLE-inclination for detected catalogue objects (BPE-1/2000).

2.1.4 Radar Cross Section and Size Estimation

Most of the space objects have a fluctuating radar signature, from which one can deduce, e. g., maximum, mean, and median RCS data. But which RCS is representative for the object size? For BPEs, the size estimation is based on RCS data which were derived from

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the maximum amplitude of the reflected signal during beam-crossing, i.e., from one or two more or less noisy echoes, not knowing the attitude of the object. The RCS is corrected for the angular path offset via a model of the beam. The latter is known to a satisfying standard, and is used in the radar performance model of PROOF, but the path offset is only determinable with sufficient accuracy if the SNR exceeds about 15 dB, and the object crosses inside a beam width of about 0.6° .

RCS is converted to a characteristic length using the NASA Size Estimation Model (SEM), which is described in Section 2.2.4 below.

2.1.5 Results

The TIRA radar detected 459 objects in the 24 hours starting at 12:00 GMT on 29 June, 2006. Appendix A is a list of the detections, which includes the time of the detection, the slant range to the target, the range rate of the target relative to the line-of-sight of the radar, and the radar cross section of the target. In addition to these raw measurements, the list also includes the derived parameters of altitude, Doppler inclination, and characteristic length. NASA compared the measured detection time, range, and range rate against predicted values for objects in the USSTRATCOM catalog and has included possible correlations with cataloged objects for appropriate detections.

Figure 5 shows the size distribution collected over the entire range window from 300 – 2000 km. Figure 6 shows the altitude vs. Doppler inclination for each of the 459 detections.

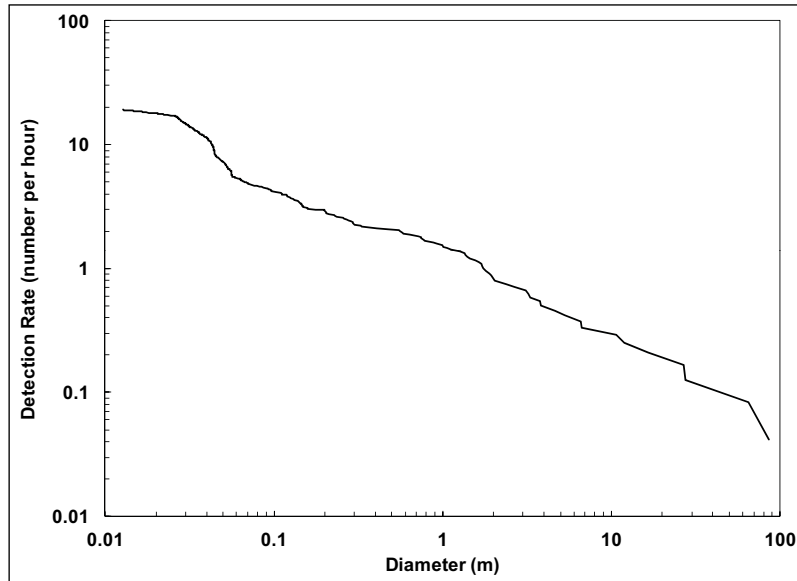


Figure 5. Size distribution for all objects detected by TIRA in the 2006 campaign.

There are a couple of features of these results which appear unusual. There are six objects that have an RCS of greater than 20 dBsm (characteristic length $> \sim 10$ m), with the largest having an RCS of 37.7 dBsm. This corresponds to a characteristic length of 86 m. The

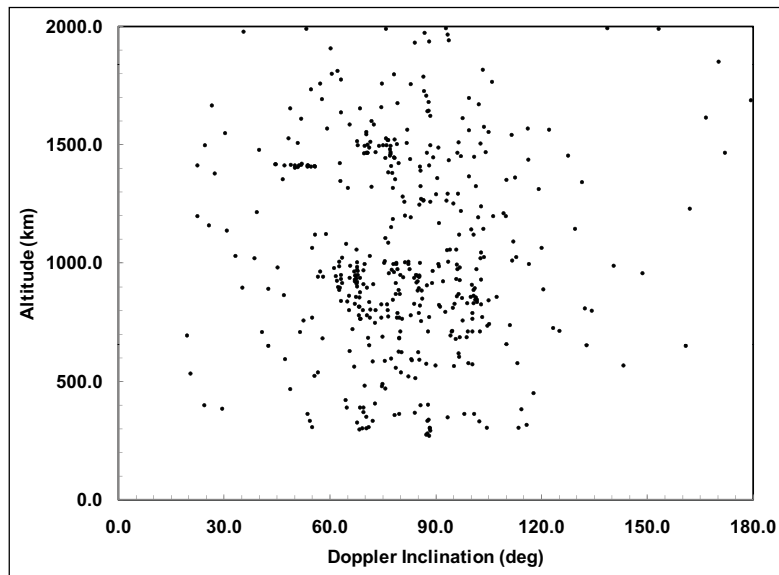


Figure 6. Distribution of Altitude vs. Doppler-inclination for TIRA detections in the 2006 campaign.

detection correlated to Satellite Number 28637, which is a Minotaur upper stage. The characteristic length in this case is obviously erroneous, as it probably is for the other objects calculated to be larger than 10 m. A plausible potential explanation is that the radar observed a cavity (e.g., an engine nozzle) or glint off of the stage which gave it an enhanced RCS.

The second feature is the near horizontal grouping in Figure 5 near 1400 km and an inclination of 50°. This grouping of detections is consistent with mainlobe and sidelobe detections of the GlobalStar constellation at 1414 km altitude and 52° inclination.

2.2 Haystack and Haystack Auxiliary

Beginning in 1990, the Haystack Radar has been observing the orbital debris environment using a fixed stare operational mode. Since October 1994, these data have been supplemented by data from the nearby HAX radar, which has a shorter wavelength but transmits and collects over a much smaller antenna, giving a reduced size detection capability but increased statistics for larger objects. Haystack and HAX are nearly co-located at latitude 42.6° in Tynsboro, Massachusetts (see Figure 7).

The Haystack and HAX measurements have provided orbital debris researchers with the ability to detect small debris from previously unknown sources and the ability to examine continuous size distributions for sizes ranging from cataloged objects to objects smaller than 1 cm diameter. Further, Haystack has shown that the debris environment is dynamic and can change rapidly. Historic Haystack and HAX results are contained in numerous references (for example [4], [5], and [6]).

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Figure 7. Haystack radome on the right and the smaller HAX radome on the left.

During the 2006 IADC 24-Hour Campaign, 19.5 hours of Haystack data were collected with the radar pointing at 75° elevation and at an azimuth of 90° . This pointing angle was chosen as a compromise between maximizing the sensitivity of the radar by minimizing the slant range to an altitude and providing enough off vertical pointing to provide reasonable Doppler inclination resolution. The data was collected from approximately 12:00 UT on 5 July, 2006 until 12:00 UT on 6 July, 2006. HAX collected 19.6 hours of data over the same time interval. For this campaign, HAX was pointed in the same direction as Haystack, 75° elevation at 90° azimuth.

2.2.1 Experiment Setup

The Haystack and HAX radars are high power, X-band and Ku-band, monopulse tracking radars with very high sensitivity. To detect debris, a pulsed, single frequency waveform is used.

The operating parameters for the Haystack and HAX radars during the debris measurements are shown in Table 2. For Haystack, the single pulse signal-to-noise ratio (SNR) on a 1-m^2 target at 1000 km range is 59.7 dB. With Haystack, objects as small as 1 cm diameter can be observed at ranges greater than 1000 km under normal operations.

For debris observations, both radars are operated in a staring, or “beam park,” mode in which the antenna is pointed at a specified elevation and azimuth and remains there while debris objects randomly pass through the field of view. This operational mode provides a fixed detection volume important to the measurement of the debris flux, or number of objects detected per unit area per unit time. By operating the radar in a stare mode and not tracking detected debris objects, a precise measurement of the object’s orbit is sacrificed. However, by examining the signals from the monopulse angle channels operating in an open-loop mode, position in the radar beam for each pulse can be determined. From this path through the beam, rough orbital elements are deduced.

2.2.2 Processing

In the debris mode, the signal strength for each received pulse is recorded from four separate channels: the Principal Polarization (PP) sum channel, Orthogonal Polarization

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Table 2. Haystack & HAX Instrument Parameters

Operating Parameter	Haystack	HAX
Peak power (kW)	400	60
Transmitter Frequency (GHz)	10	16.7
Pulse width (msec)	1.638	1.638
Fraction of Pulse retained after digital filter	0.8	0.8
Pulse repetition frequency (Hz)	45	60
Receiver window (msec)	12.124	12.124
Antenna Diameter (m)	36	12.2
Antenna Beam Width (deg)	0.058	0.1
Antenna Gain (dB)	67.2	64
System temperature (K)	246	200
Total System losses (dB)	4.9	4
Single Pulse SNR on 0dB m ² target at 10 ³ km (dB)	59.7	40.6
Range Gates	16	16
Intermediate Frequency Bandwidth (KHz)	1000	1000
Independent Range Samples	12124	12124
FFT Size	4096	4096
Number of non-coherent integrated pulses used for detection	16	16

(OP) sum channel, Traverse Difference (TR) channel, and Elevation Difference (EL) channel (see Figure 8). The ODAS software determines the signal strength, SNR ratio, TR and EL voltage ratios, range and range rate. Other parameters are derived from these

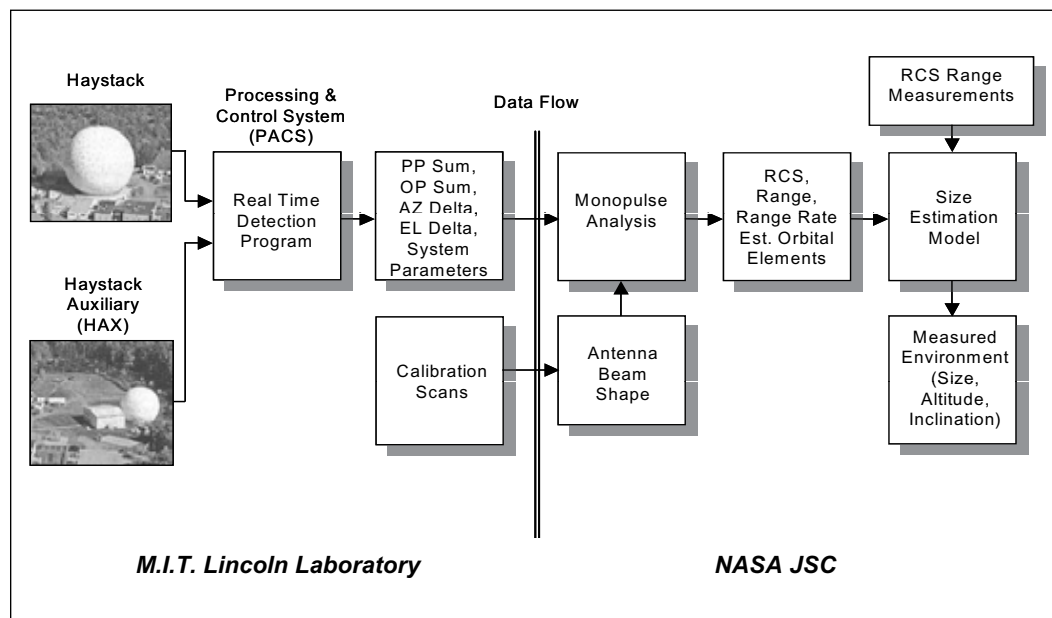


Figure 8. An overview of the data collection and analysis.

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measurements. For an orbiting object passing through the radar field-of-view, the key step in the data processing is determining the location of the debris object in the radar beam for each radar pulse. From these locations, the motion of the object through the beam can be recreated and used to estimate rough orbital elements. Also, the signal strength can be augmented by the relative antenna gain determined by the antenna beam-pattern calibration discussed below. Thus, the returned signal strength can be estimated as if the object were at the center of the radar beam. The radar cross section (RCS) is determined by applying the absolute radar calibration, antenna beam shape, and the range to the object.

Calibration

The sensitivity of the antenna pattern is measured by scanning around a calibration sphere as it moves across the sky. This determines both the absolute calibration and the antenna beam pattern. Spheres return a circularly polarized signal with only a principal polarization (PP) component. Test signals injected into the receiver preamplifiers are used to determine the absolute OP calibration.

Shape Factor

A simple SNR threshold test is used for object detection. The noise floor varies, however, as a function of Doppler frequency. A “shape factor” representing the noise floor is subtracted from the signal emerging from the intermediate bandwidth filter. This shape factor is determined by averaging a large number of pulse returns which do not contain a valid detection. Figure 9 shows the shape factor associated with the digital filter.

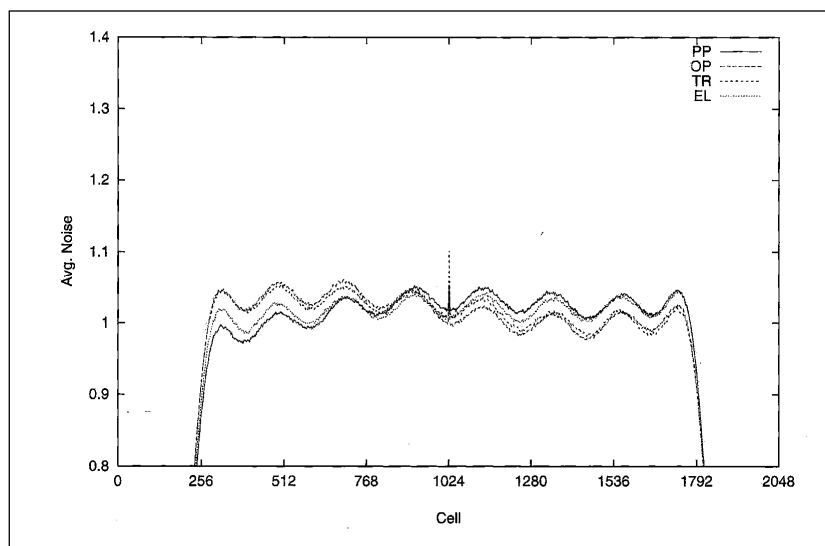


Figure 9. Noise floor with digital filter.

2.2.3 Doppler-Inclination

Both the Haystack and HAX radars primarily report Doppler inclination, although the path through the beam is estimated to correct for antenna pattern loss when calculating RCS.

2.2.4 Radar Cross Section and Size Estimation

Physical size is estimated from RCS using NASA's Size Estimation Model (SEM). Debris objects were selected from two hypervelocity impacts of simulated satellites. Some artificial debris-like objects were also included in the sample to better represent the postulated orbital debris environment. This included a printed circuit board and a piece of solid rocket motor aluminum oxide (Al_2O_3) slag. The RCS values of these 39 debris objects were measured at a controlled RCS radar range operated by the System Planning Corporation. The RCSs of these objects were measured over 4 radar frequency bands (2.5647-3.9111 GHz, 4.116-7.986 GHz, 8.1544-12.7684 GHz, and 12.924-17.538 GHz) with 8 steps in the band of the lowest frequency and 16 steps in the band for the other three, and with hundreds of source-object orientations. These frequencies, S-, C-, X-, and Ku-band, respectively, were chosen since they represent radar frequencies often used for orbital debris observations.

The characteristic length of an object is defined as the average of the largest dimensions for an object measured along three orthogonal axes. The first axis was chosen to coincide with the largest dimension, the second axis to coincide with the largest dimension in a plane orthogonal to the first axis, and the third axis to be orthogonal to the first two axes. In this report, the characteristic length of an object is often referred to as size or diameter.

Consistent with Maxwell's equations of electromagnetics, radar data from different wavelengths can be compared by normalizing the size by the wavelength of the measuring frequency and the RCS by the wavelength squared. This results in a size parameter $x = \text{size}/\text{wavelength}$ and a RCS parameter $z = \text{RCS}/\text{wavelength}^2$. Figure 10 shows the relationship between the measured RCS parameter and the object's physical size parameter. Each of the

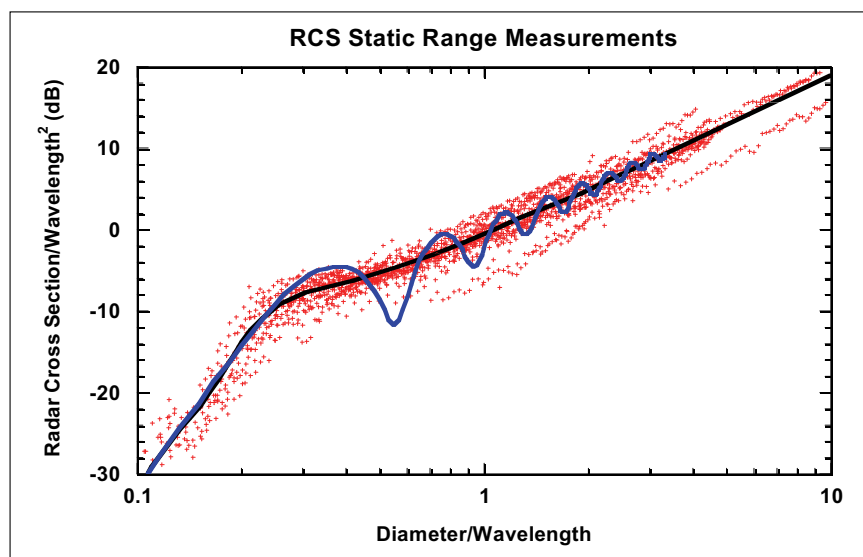


Figure 10. Results of RCS-to-Physical size measurements on 39 “representative” debris objects over the frequency range 2.0 - 18 GHz (15 - 1.67 cm wavelength).

Each point represents an average RCS for a single object measured at a single frequency over many orientations. The oscillating line is the radar cross section for a spherical conductor while the smooth line is the polynomial fit to the data.

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2072 points on this plot is a weighted average for a single object over hundreds of different orientations at a single frequency. The data was weighted to account for nonuniform sampling of the object orientations as the data was collected.

From this plot a scaling curve (smooth solid line) was developed which represents the mean of the measured RCS for each size/wavelength. For debris sizes much smaller or larger than the radar wavelength, the scaling curve approaches the Rayleigh or optics region curves, as expected. Between the Rayleigh and optics region curves is the Mie resonance region that results in an enhanced RCS measurement, on average, for a given size. In the resonance region, the scaling curve deviates from the optical curve (not shown) such that for a given RCS, the object is smaller in characteristic length than it would have been interpreted to be by using the optical approximation. The scaling curve may be expressed as:

$$x = \sqrt{\frac{4z}{\pi}}, \text{ for } z > 5, \text{ Optical Regime}$$

$$x = \sqrt[6]{\frac{4z}{9\pi^5}}, \text{ for } z < 0.03, \text{ Rayleigh Regime}$$

$$x = g(z), \text{ in between, Mie Resonance Regime}$$

where $z = \text{RCS}/l$, $x = \text{diameter}/l$, and l is wavelength. In the above equations, the quantity z is assumed to not be expressed in dB. The smooth function $g(z)$ is expressed by 23 points in Table 3.

Table 3. The NASA SEM curve $x=g(z)$ in the Mie resonance region.

$x=\text{diameter}/\lambda$	$z=\text{RCS}/\lambda^2$
0.10997	0.001220
0.11685	0.001735
0.12444	0.002468
0.13302	0.003511
0.14256	0.004993
0.15256	0.007102
0.16220	0.01010
0.17138	0.01437
0.18039	0.02044
0.18982	0.02907
0.20014	0.04135
0.21237	0.05881
0.22902	0.08365
0.25574	0.1190
0.30537	0.1692
0.42028	0.2407
0.56287	0.3424
0.71108	0.4870
0.86714	0.6927
1.0529	0.9852
1.2790	1.401
1.5661	1.993
1.8975	2.835

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Note that most of the debris for Haystack is in the Rayleigh region, which allows size estimates that are relatively insensitive to errors in the RCS measurements.

For comparison, the oscillating RCS-to-size curve for a spherical conductor is shown in the figure. The NASA SEM is not applicable to estimate sizes of spherical conductors (such as NaK droplets) in the Mie Resonance region. The oscillations result from constructive and destructive interference of electromagnetically induced waves on the surface of the conducting sphere.

The size-to-RCS curve for a spherical conductor is expressed theoretically as:

$$z = \frac{1}{\pi} \left| \sum_{n=1}^{\infty} (-1)^n \left(n + \frac{1}{2} \right) (b_n - a_n) \right|^2$$

where the coefficients a_n and b_n are

$$a_n = \frac{j_n(2\pi x)}{h_n^{(2)}(2\pi x)}$$

$$b_n = \frac{2\pi x \cdot j_{n-1}(2\pi x) - n \cdot j_n(2\pi x)}{2\pi x \cdot h_{n-1}^{(2)}(2\pi x) - n \cdot h_n^{(2)}(2\pi x)}$$

Where $h_n^{(2)}(x) = j_n(x) - i \cdot y_n(x)$, in which $j_n(x)$ and $y_n(x)$ are the spherical Bessel functions of the first and second kinds, respectively.

2.2.5 Results

All detections with a 16-pulse, non-coherent, integrated signal-to-noise ratio above 5.0 dB are recorded. For Haystack, a noise threshold of 5.5209 dB was used, corresponding to a theoretical noise-induced false alarm rate of 1 in 10 hours [7]. During the 19.5 hours of Haystack data collection, 154 objects passed through the 0.058° antenna beam center with signals above the SNR threshold.

HAX typically has a lower detection rate than Haystack because of its lower sensitivity. Therefore, the detection threshold is set at a higher level to give roughly the same ratio of detections to false alarms. For this campaign, a threshold of 5.96 dB was used, giving a noise-induced false alarm rate of 1 in 100 hours. During the 19.6 hours of HAX data collection, 23 objects passed through the 0.1° beam with signals above threshold. Of these 23 objects, 11 were detected simultaneously in the Haystack main beam. An additional seven were also seen by Haystack, but beyond the half power contour of the main lobe where detections are accepted for Haystack.

Figure 11 shows the detection rate as a function of size for all valid detections observed by Haystack during the campaign. Figure 12 is a scatter plot of Doppler inclination vs. altitude. Figures 13 and 14 show the same for HAX.

A detection list is shown in Appendix B for Haystack and in Appendix C for HAX.

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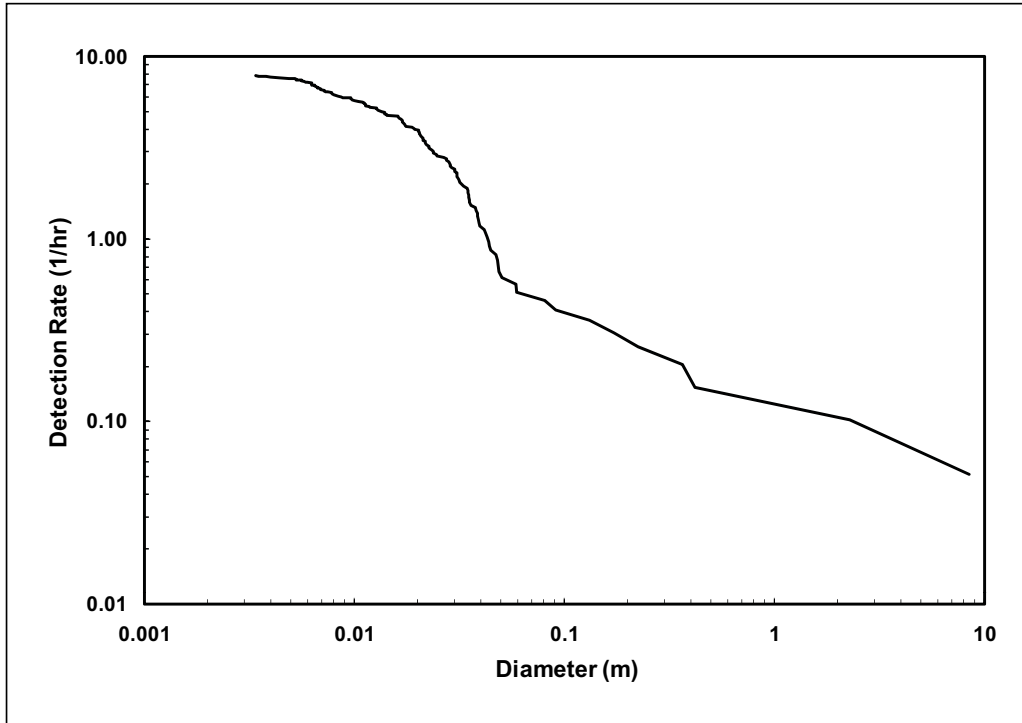


Figure 11. Size distribution for all objects detected by Haystack in the 2006 campaign.

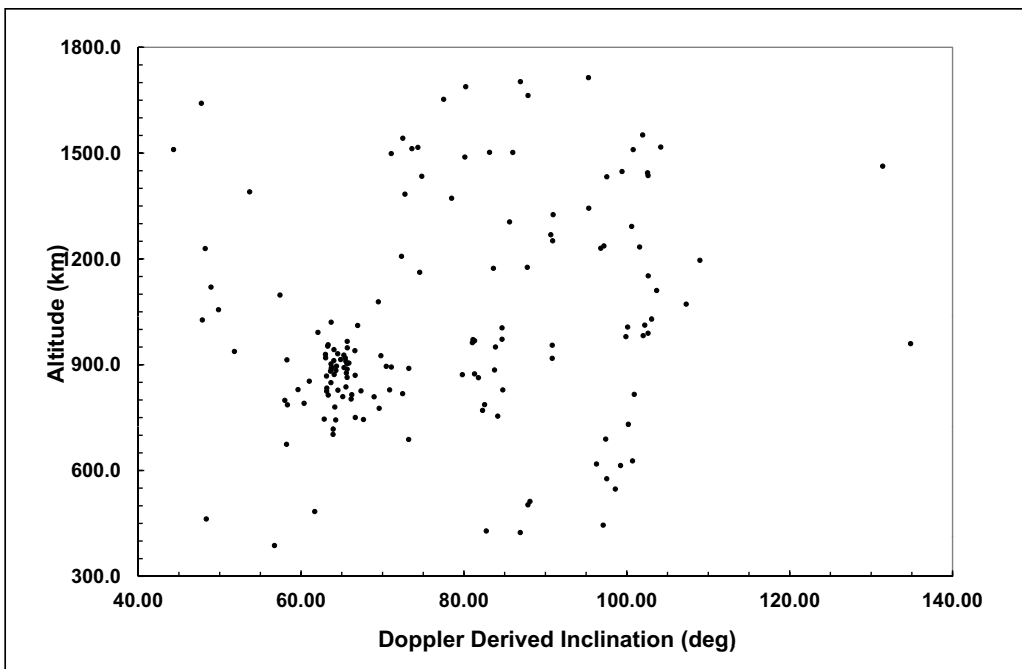


Figure 12. Distribution of Altitude vs. Doppler-inclination for Haystack detections in the 2006 campaign.

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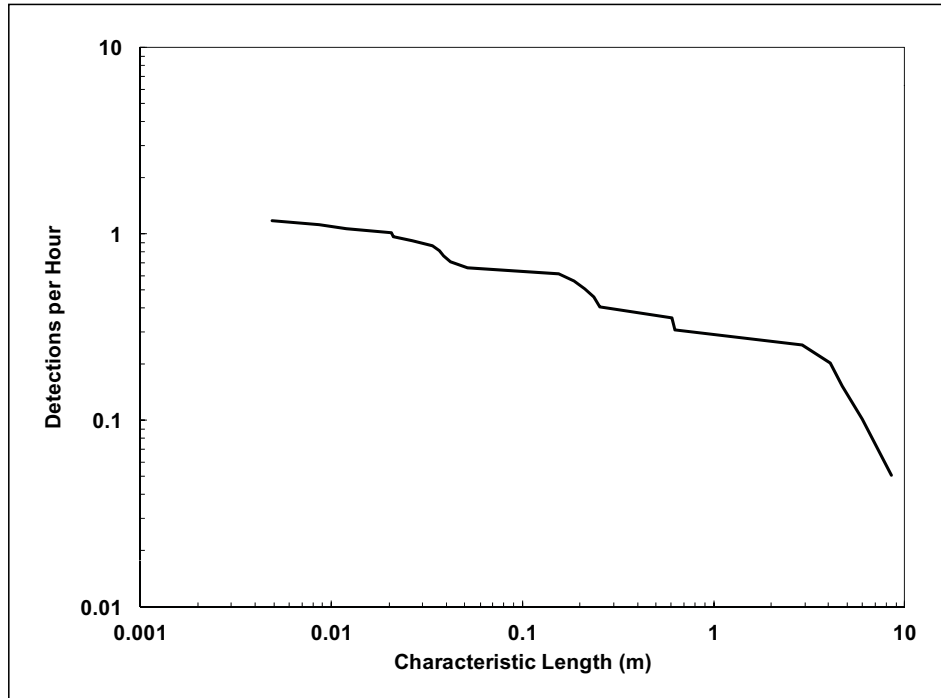


Figure 13. Size distribution for all objects detected by HAX in the 2006 campaign.

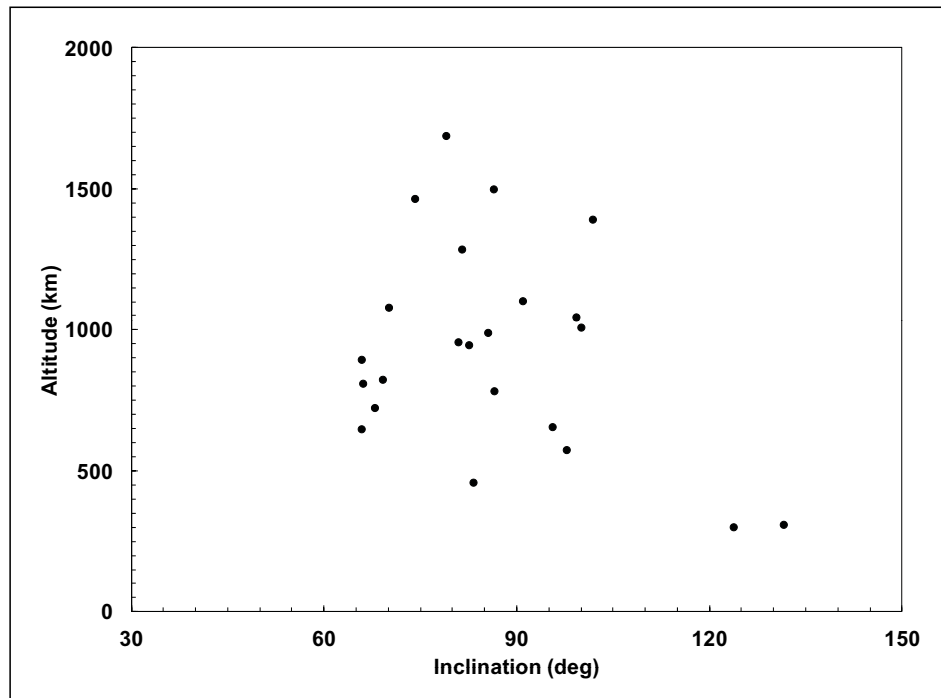


Figure 14. Distribution of Altitude vs. Doppler-inclination for HAX detections in the 2006 campaign.

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2.3 EISCAT

EISCAT's contribution to the international 24-hour IADC debris campaign consisted of measurements at the EISCAT Svalbard radar (ESR) from 12 UT July 8th to 12 UT July 9th. For the measurement, the smaller of the two ESR antennas, the 32 m antenna, was used pointed to azimuth 90° (East) and elevation 75° (Figure 15). The antenna has gain 42.5 dBi and half-power beam width 1.09° . A measured gain pattern for the ESR 32 m antenna is not available; as a substitute, an idealized antenna pattern is shown in Figure 16, together with the actual measured pattern of EISCAT's 930 MHz 32 m antenna of Tromsø, scaled to 500 MHz wavelength. The geographic location of the ESR site is latitude 78.15313° N, longitude 16.02875° E, elevation 445 m. The EISCAT pointing geometry program uses geocentric Cartesian coordinates $x = 1262.647$ km, $y = 362.744$ km, $z = 6220.902$ km and a spheroid with axes at 6378.135 km and 6356.75 km.



Figure 15. ESR antennas, in the early hours of July 9, 2006. The 32 antenna (left) is pointed towards East, azimuth 90° , at 75° elevation. The magnetic-field-aligned ESR 42 m antenna (right) was not used in the beam park measurement.

2.3.1 Processing

For this campaign, a modified version of the standard EISCAT ESR experiment “steffe” scan pattern was used, resulting in an experiment called *steffeleo*. The standard *steffe* has two frequency channels, one transmitting a $480 \mu\text{sec}$ binary phase coded pulse intended for the lower ionosphere, the other transmitting a $1680 \mu\text{sec}$ binary phase coded pulse for higher altitudes. The two pulses are separated by $1520 \mu\text{sec}$, and the arrangement repeats every

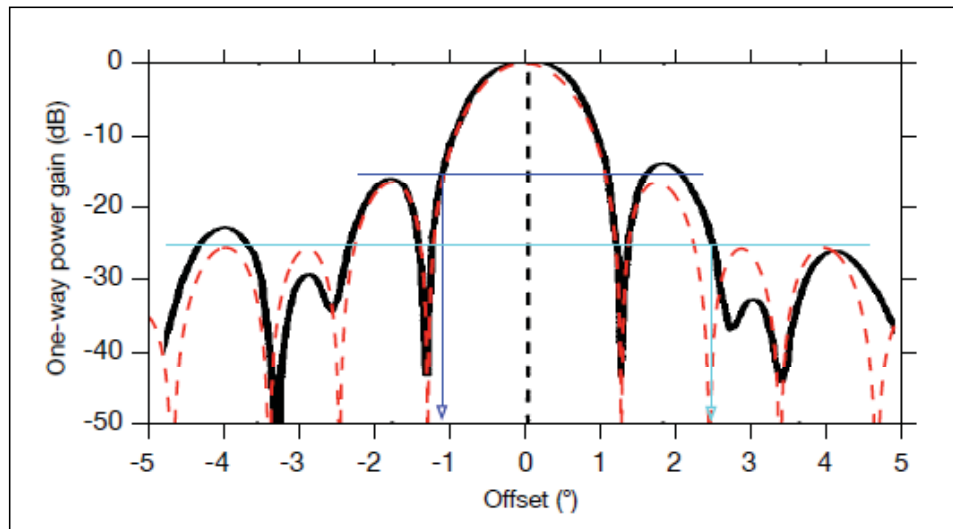


Figure 16. ESR 32 m antenna's gain pattern. In the top panel, the dashed red line is a simple theoretical gain model, the solid black line is the measured power gain of EISCAT Tromsø 32 m antenna, scaled by wavelength difference. The 3 dB beam width is $2 \times 0.55^\circ$, and the maximum gain is 42.5 dBi.

9375 μ sec. Two modifications were made to the steffe transmission. First, the repetition period was increased to 20,000 μ sec to obtain uninterrupted altitude coverage over the whole LEO, and second, the transmission frequencies were adjusted slightly, so that the two frequencies were more suitably located for the space debris receiver sampling system. In steffeleo, the shorter pulse is transmitted at 500.4 MHz and the longer one at 500.1 MHz. After down conversion, these frequencies appear at 10.85 MHz and 11.15 MHz at the radar's second IF, where they are sampled by the EISCAT debris receiver using a primary sampling rate of 44 MHz. After demodulation by Hilbert-transform and sampling rate reduction to a final 1 MHz complex sampling rate, the two frequency channels are centered at +150 kHz and -150 kHz in the base-band.

Only the longer of the two pulses was used for the analysis presented here, so the effective transmission duty cycle was 8.5%. The recorded data was processed both using coherent pulse-to-pulse integration within the match function method (FMF) and by non-coherent pulse-to-pulse integration (NCI). Target detection was done using 15-pulse (0.3 sec) integration. For the coherent integration, the detection threshold was set to $ENR = 24$, corresponding to a false alarm time of four false alarms every 10 hours, and for the non-coherent integration, the threshold was set to $ENR = 39$, corresponding to a false alarm time of 24 hours. Due to ionospheric clutter, for ranges below 750 km in NCI and below 600 km in FMF, a range-dependent threshold was used, as shown in Figure 17. It must be noted that for noise background subtraction, the same range-independent value was used throughout in analysis ($ENR = 1$ in FMI and $ENR = 15$ in NCI). This is not correct for the region of range-dependent thresholds, but affects only a relatively small number of events.

For more detailed information on the collection and analysis of EISCAT debris measurements, please see Markkanen, et.al., 2005 [8] and Markkanen, 2005 [9].

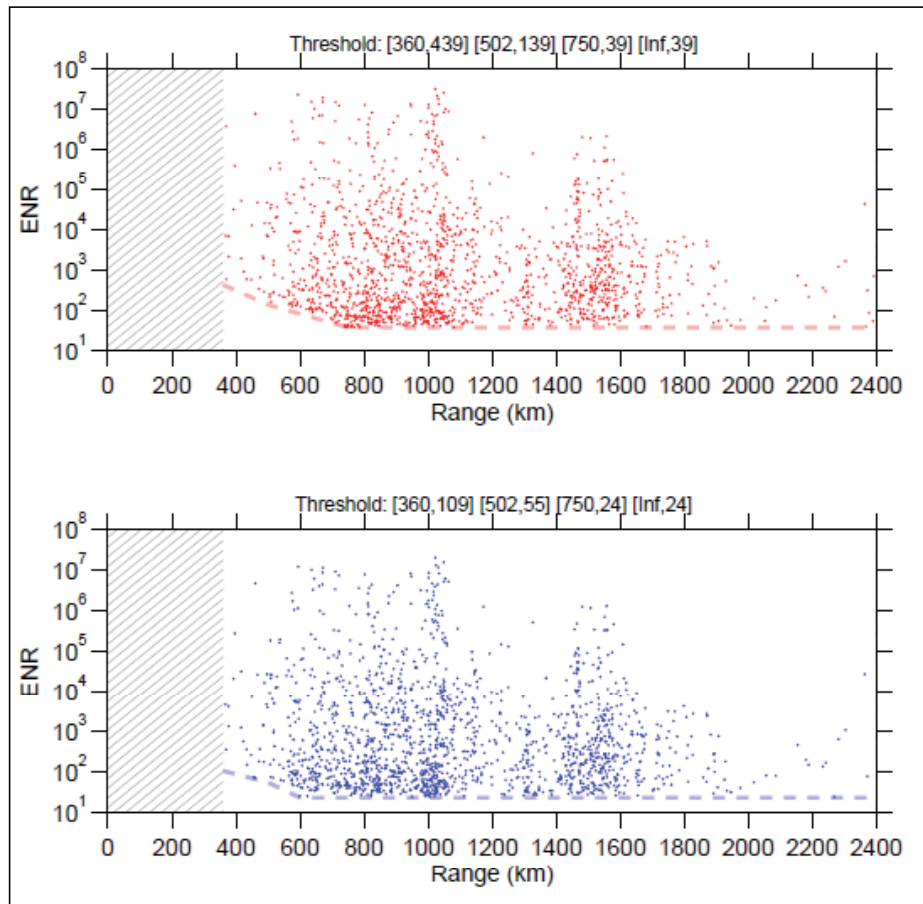


Figure 17. ENR against range, 0.3 sec integration. Top panel is for noncoherent integration, bottom panel for coherent integration. The dashed lines show the detection threshold, the vertices of the lines are listed in the panel headers. The detection in both integration schemes was done with 0.3 sec integration time, but the parameter analysis for coherent integration was done with 0.2 sec integration time. The resulting ENR estimates for the coherent integration have been scaled by 3/2 to refer them back to the 0.3 sec integration time for plotting (ENR in the result files for CI refer to 0.2 sec integration). In the non-coherent integration, also the parameter estimation used 0.3 sec integration time.

2.3.2 Radar Cross Section and Size Estimation

Since ESR is not a monopulse radar, the path through the radar beam is not determined. Therefore, the RCS calculation assumes that the object is at the center of the radar beam. Additionally, no attempt to remove sidelobe detections is made.

EISCAT does not use the NASA SEM to convert between ENR and physical size. Rather, it uses an even more simplified curve. It uses the optical approximation throughout both the optical and Mie scattering regimes and uses the Rayleigh approximation in the Rayleigh regime (Figure 18).

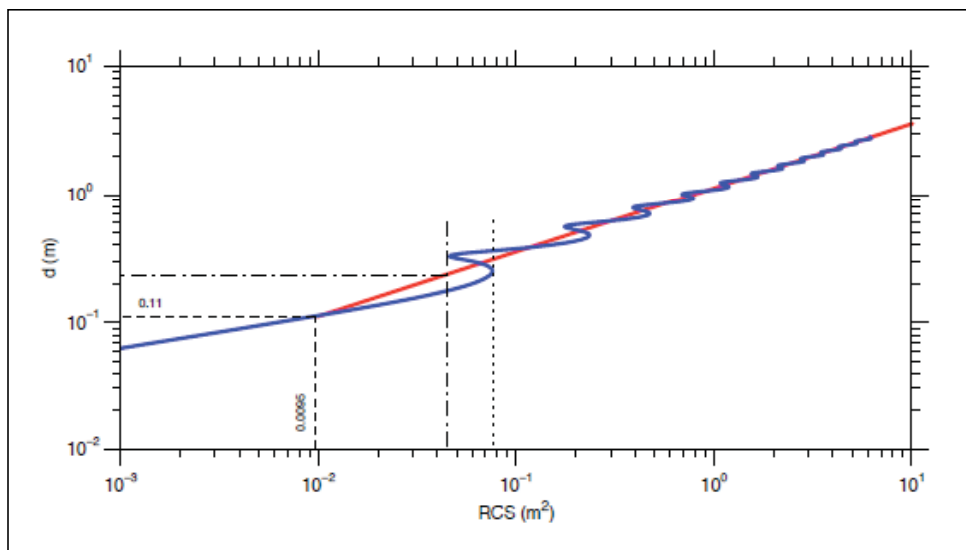


Figure 18. Converting RCS to diameter. EISCAT uses a simplified model (red line) for the cross section of the conducting sphere, using the optical approximation until it intersects with the Rayleigh approximation.

2.3.3 Results

For these integration arrangements, ideally the coherent integration is expected to be 2.0 dB more sensitive in terms of the smallest detectable ENR, but, after final analysis, the two methods gave essentially identical sensitivity, especially for ranges greater than 750 km where constant threshold could be used. With the NCI, the final object count was 1629 objects, with FMF, 1659 objects. These counts include objects up to the maximum range of 2400 km, but only 16 (NCI) and 12 (FMF) objects with ranges larger than 2053 km (which corresponds to the high end of the LEO region at 2000 km altitude) were detected. The total number of detections recorded during the experiment was 1717 for NCI and 2306 for FMF. Figure 19 shows the size distribution for all objects in both integration schemes.

Figure 20 shows the range-rate measurement as a function of altitude. For this collection period, EISCAT used the same pointing parameters (90° azimuth and 75° elevation) as Haystack/HAX. Ascending and descending orbits give different Doppler range rates for circular orbits for radars pointing due east. This is because on a spherical Earth, the radar beam diverges from the line of constant latitude as range increases. For Haystack/HAX and TIRA, this is a minor effect and the two possible answers are averaged when converting Doppler to inclination. However, EISCAT's much higher latitude makes the ambiguity much larger (Figure 21). However, plotting the Doppler contours for inclinations known to have large populations (Figure 22), it becomes apparent that EISCAT is seeing similar inclination distributions as the other sensors in the campaign.

EISCAT detections are listed in Appendix D. ASCII-format listings of the EISCAT beam-park measurement results are also publicly available via the web page at <http://www.eiscat.com/spade/index.html>.

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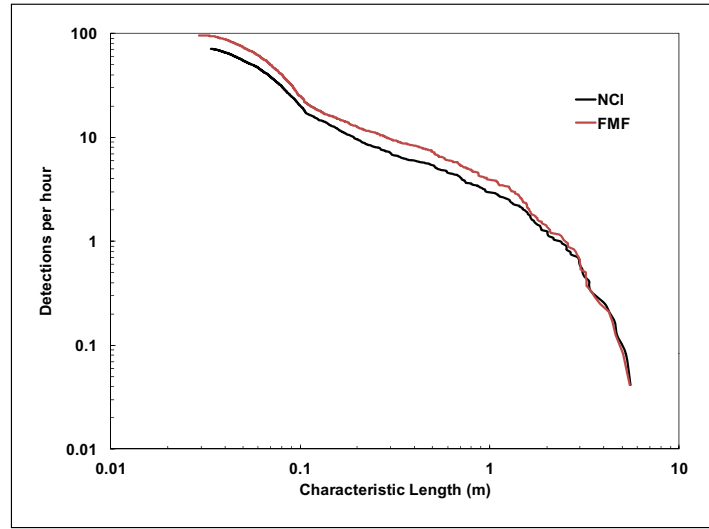


Figure 19. Size distribution observed by the EISCAT radar during the 2006 campaign.

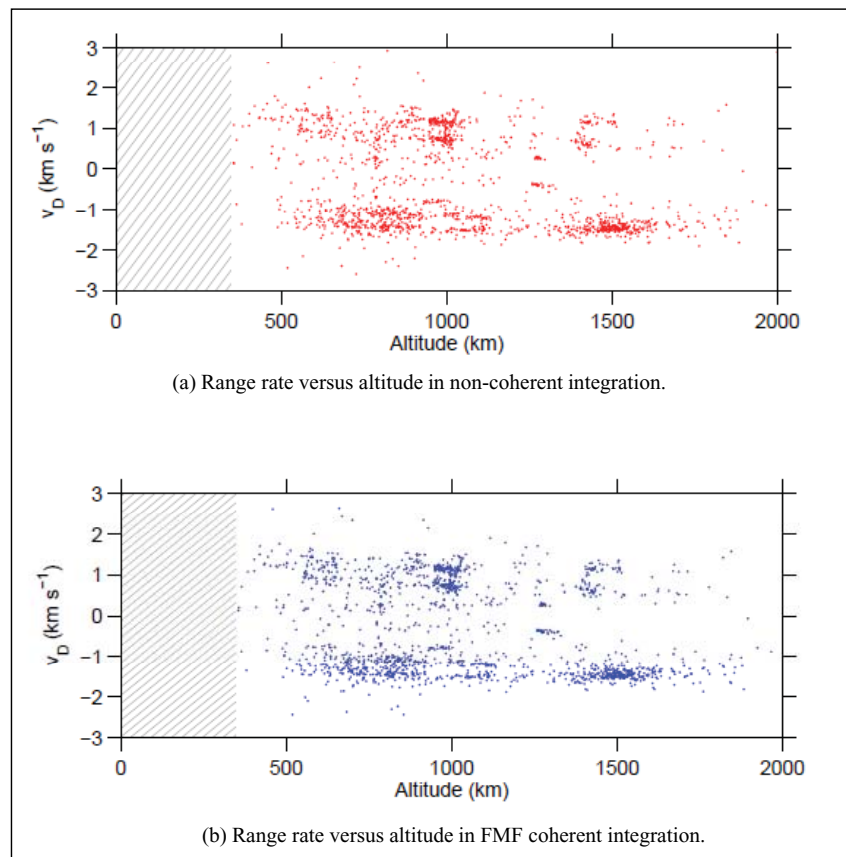


Figure 20. Distribution of Range Rate, or Doppler, vs. Altitude for EISCAT detections in the 2006 campaign.

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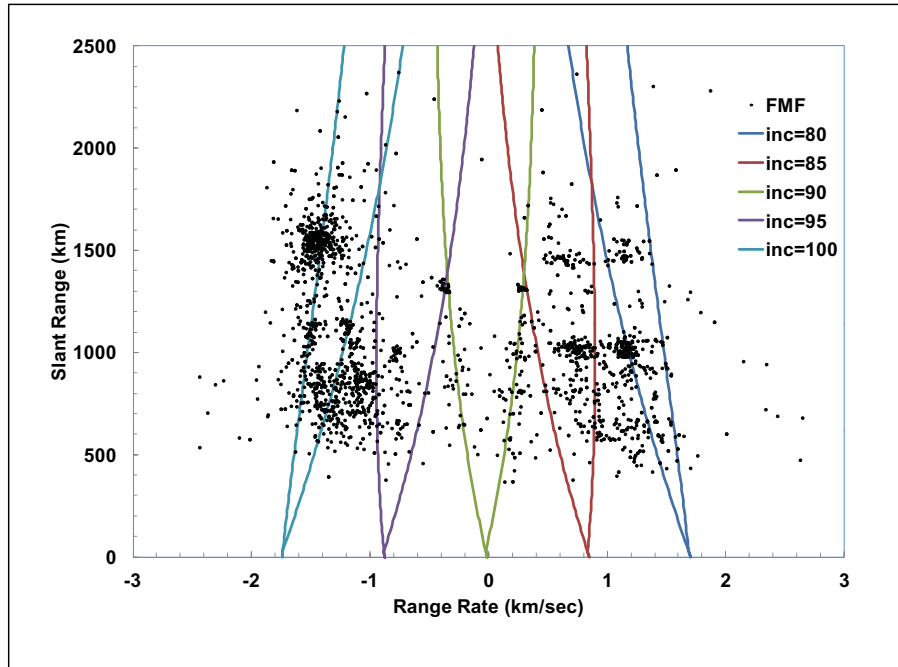


Figure 21. Range-Range Rate contours of constant inclination for the EICAT radar pointed at 90° azimuth and 75° elevation. The “V” shape is results from ascending (south to north) and descending (north to south) passes and the spherical Earth.

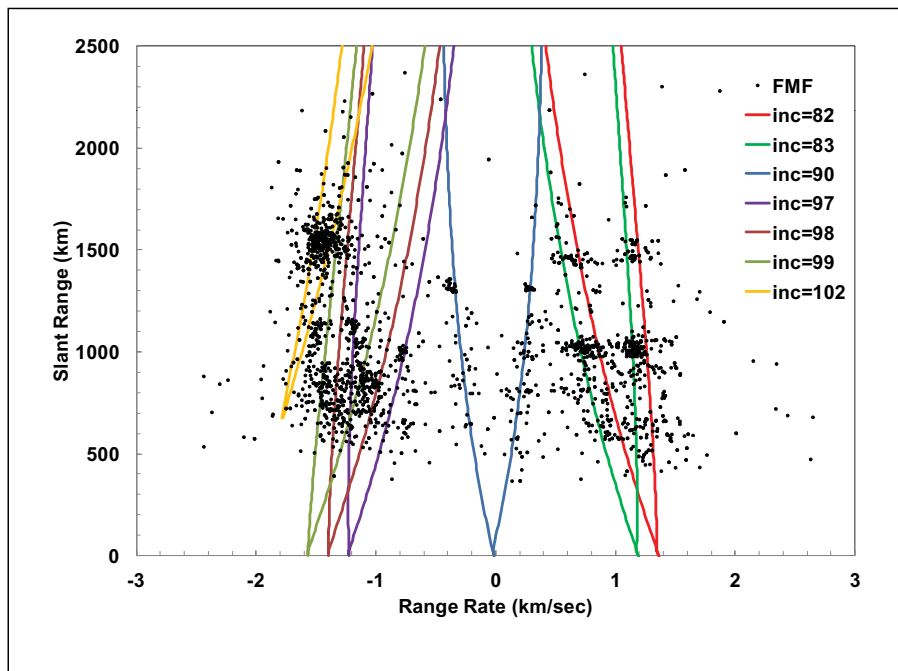


Figure 22. Range-Range Rate contours of constant inclination for the EICAT radar pointed at 90° azimuth and 75° elevation and known highly populated inclinations.

3 Phased Array Radars

3.1 Cobra Dane

The AN/FPS-108 Cobra Dane radar (Figure 23) is operated by the US Department of Defense. It is located on Shemya Island, AK at 52.7° N latitude and 174.1° E longitude. Cobra Dane is an L-band (23-cm wavelength) phased array radar which first became operational in 1977. The radar generates approximately 15.4 MW of peak RF power (0.92 MW average) from 96 Traveling Wave Tube (TWT) amplifiers arranged in 12 groups of 8. This power is radiated through 15,360 active array elements. The face of the radar is aligned at an azimuth of 319°, true.



Figure 23. Cobra Dane phased array radar.

The Cobra Dane is different from the Haystack/HAX radars in that it is an electronically steered, phased array radar. This means that the antenna beam can be instantaneously moved within some angular limits. What is typically done with phased array radars is to rapidly move the beam in a long, narrow pattern to create a virtual fan beam, or fence. If each individual beam position in the fence is revisited often enough that orbiting objects cannot travel the width of the fence between revisits, then the fence is referred to as a “leak proof” fence. While maintaining the fence, some radar time and transmit power is typically allocated for tracking of objects detected by the fence.

The operating parameters for the Cobra Dane radar during the debris measurements are shown in Table 4.

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Table 4. Instrument Parameters for the Cobra Dane radar used during the 2006 campaign.

Instrument Parameters	
Geocentric latitude (deg)	52.737N
Geocentric longitude (deg)	174.091E
Geodetic altitude (km)	0.091
Wavelength (m)	0.23
Beamwidth (deg)	0.6 x 40
Antenna Constant (dB)	unavailable
Transmitted power (MW)	15.4 Peak - 0.92 Avg
Pulse period (msec)	varies
Pulse duration (msec)	1.5
Desired false alarm time	unavailable
Number of independent threshold decisions per pulse	unavailable
Maximum number of pulses to integrate	unavailable
Noise equivalent RCS (NRCS)	unavailable
Pulse duration for NRCS	unavailable
Range for NRCS	unavailable
Beamshape	unavailable
Detection probability as a function of object diameter and range	unavailable

3.2 Data Collection

Cobra Dane operated for 24 hours from ~00:00:00 GMT on 28 August to 00:00:00 GMT on 29 August, 2006. During the campaign, a 40° wide fence at an elevation angle of 50.3° and covering the azimuth range from 299° - 339° was erected. The fence was one beamwidth wide, or 0.6°. The radar detected objects crossing this fence at slant ranges from 415 - 2501 km. A 1500 µsec pulse was used for detection. Objects passing through the fence were checked against known objects in the US Space Surveillance Network (SSN) catalog (including analyst, or 80,000 series satellites). If the detection was correlated with a known object, then no further tracking was done. In this way, radar resources (time and transmit power) could be conserved for use with UCTs. UCTs detected crossing the fence would be tracked in order to estimate orbital elements and to acquire RCS information.

The fence used in this campaign is not as wide as fences used in campaigns prior to 2004 in which Cobra Dane participated. In previous campaigns a 60° wide fence was used. However, many cataloged objects which were predicted to pass through the fence were not detected by the radar. SATRAK, a program that propagates orbital elements and predicts their passage through a sensor's field of view, was employed to predict which cataloged and analyst satellites passed through Cobra Dane's fence. In the 2003 24-hour campaign, the ratio of predicted-to-detected objects was 1.23 to 1. Analysis showed that the revisit time for each beam comprising the fence was not fast enough to ensure that objects could

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not pass through the fence undetected, particularly if additional radar resources were being used to track UCTs. A fence width of 40° was chosen as a good compromise between having a large collecting area and a leak proof fence. Even with this reduced fence size, there were still objects predicted to pass through the fence which were not detected, although the ratio has dropped to 1.14 to 1.

Although Haystack can detect much smaller objects than Cobra Dane, Cobra Dane has the advantages of a much larger collecting area and the ability to determine relatively high precision orbital elements of UCTs by tracking them from the fence crossing to the limit of the radar's field-of-view. In terms of very high precision orbits, this is a relatively short tracking arc. But, it is much better than estimating the orbital elements from data collected by dish radars operated in staring mode.

3.3 Results

The Cobra Dane radar is a US Department of Defense sensor. As such, not all data products requested by NASA are available. NASA has been provided with a list of unique UCTs, their orbital elements, and RCSs detected in the 24 hours. Detections that were correlated to known objects including objects in the US Space Surveillance Network catalog of regular and analyst objects were reported only with their detection slant range. Other orbital elements and the RCS/size of the objects were obtained from other databases available to NASA. A detection list of UCTS collected during the campaign is provided in Appendix E.

Cobra Dane detected 346 UCTs passing through its fence during the campaign. Five of the detected UCTs passed through the fence twice. An additional 3982 detections correlated with known objects either in the US SSN regular catalog or "analyst satellites" (satellites routinely tracked by the SSN but not yet in the regular catalog), were predicted to pass through the fence. Of the 3982 detections, there were 3320 unique objects (2428 in the regular catalog and 892 analyst satellites). Of these, 599 passed through the fence twice on separate orbits and 68 objects passed through the fence 3 times. The size distribution of detections is shown in Figure 24.

Figure 25 shows altitude as a function of inclination for regular, analyst, and uncorrelated detections. Many of the concentrations of UCTs and analyst objects correspond to known breakups and represent objects that have recently separated from the parent body or objects that are smaller than those routinely tracked by the US SSN (or both).

One of the unique attributes of a phased array radar such as Cobra Dane is the ability to track a detected UCT while still maintaining the detection fence described above. This allows the radar to collect enough information to estimate the eccentricity of the object to an acceptable level. Figure 26 shows the perigee altitude distribution of detections as a function of orbit eccentricity for those objects for which an orbit could be calculated. Figure 27 shows the inclination vs. eccentricity distribution.

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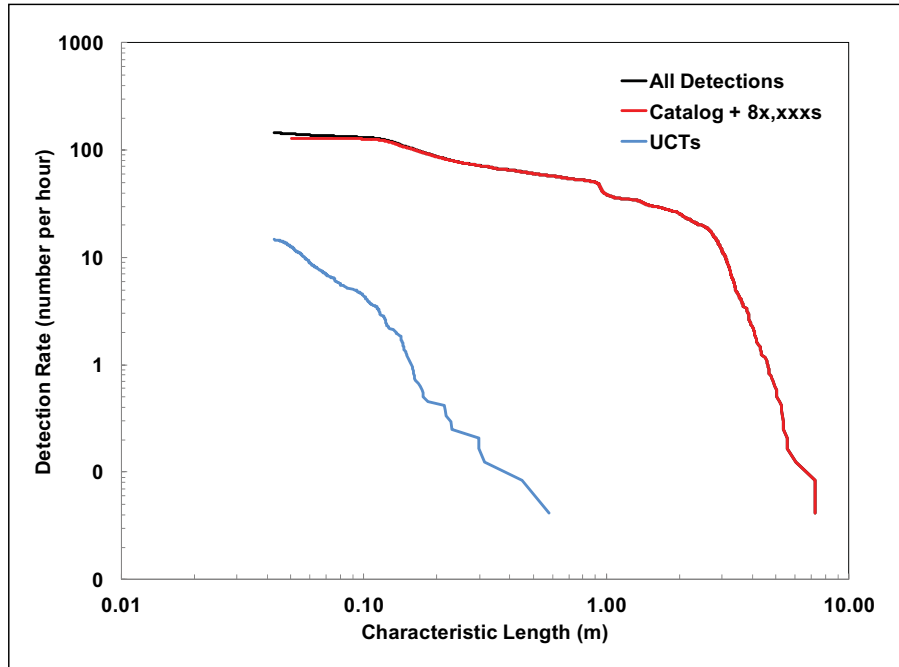


Figure 24. Size distribution for all UCTs detected by Cobra Dane in the 2006 campaign. In addition, cataloged objects which were predicted to pass through the Cobra Dane fence are shown in a cumulative distribution.

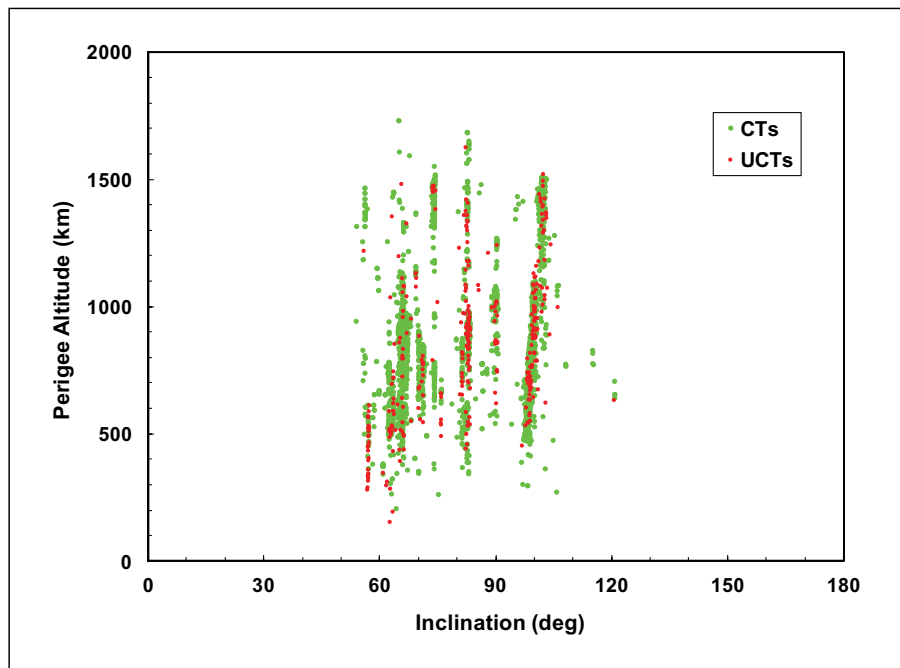


Figure 25. Distribution of Altitude vs. Doppler-inclination for Cobra Dane UCT detections and predicted known objects in the 2006 campaign.

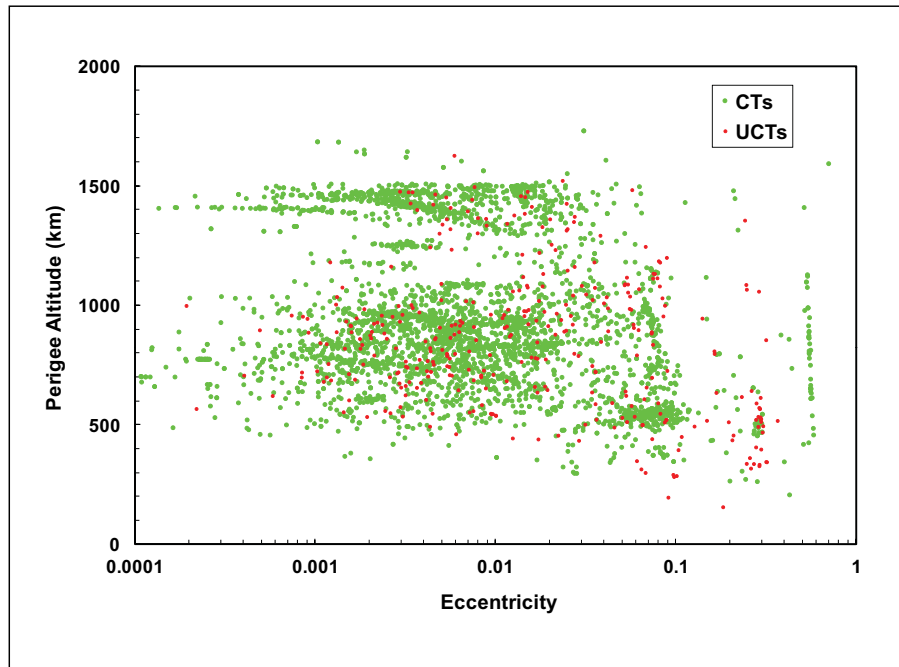


Figure 26. Distribution of Altitude vs. Eccentricity for Cobra Dane UCT detections and predicted known objects in the 2006 campaign.

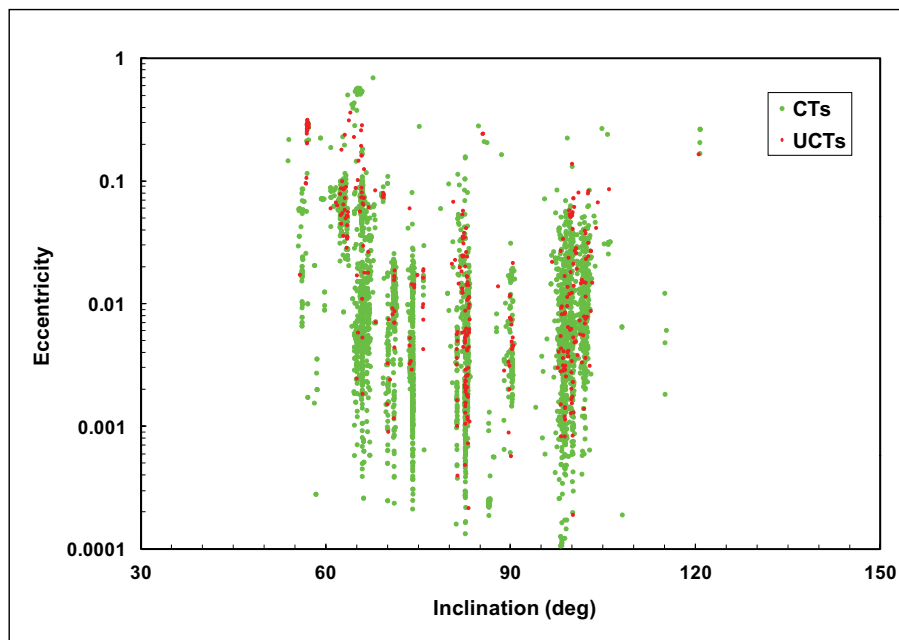


Figure 27. Distribution of Eccentricity vs. Inclination for Cobra Dane UCT detections and predicted known objects in the 2006 campaign.

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Appendix A

TIRA Detection List

System and Campaign Parameters

The following tables list the system and campaign parameters as used for the IADC 2006 campaign

Table A-1. Instrument parameters used by the TIRA radar for the 2006 campaign.

TIRA Instrument Parameters		
Geocentric latitude of sensor	50.62	deg
Geocentric longitude of sensor	7.13	deg
Geodetic altitude	0.293	km
Wavelength	0.225	m
Beam width for incoherent integration	0.49	deg
Antenna constant (Gain)	49.7	dB
Transmitted power (peak)	1300.0	kW
Pulse period	29	msec
Pulse duration	1	msec
Desired false alarm time (Marcum)	36000	sec
Number of independent threshold decisions per pulse	5667	
Maximum number of pulses to integrate	89	
Noise equivalent RCS (NRCS)	-47.5	dB m ²
Transmitted power for NRCS	1500	kW
Pulse duration for NRCS	1	msec
Range for NRCS	1000	km

Table A-2. Campaign parameters for the TIRA radar for the 2006 campaign.

Campaign Parameters		
Campaign Start	29 Jun 2006 12:00 UT	
Maximum range	2000	km
Minimum range	300	km
Azimuth of line of site	93	deg
Elevation of line of site	76.12	deg
Duration of campaign	24	hrs
Total recorded data	24.0	hrs

Beamshape

From detailed analysis it was found that TIRA's L-band beam is circular symmetric with respect to its line-of-sight (LOS) to sufficient accuracy. The (linear) intensity loss factor L_I at positions off the LOS may thus be modelled as a 1-D radial function of the path offset DF (combined azimuth and elevation offset). This function is fitted by polynomial of degree 10 with neglectable errors in the path offset range $0^\circ \leq \Delta\Phi \leq 0:58^\circ$:

$$L_I = \sum_{i=0}^{10} a_i \Delta\Phi^i ,$$

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where $\Delta\Phi$ is given in degrees and the coefficients are provided in the Table A-3

Table A-3. Coefficients for loss factor polynomial fit.

a10	-3420.319965
a9	10866.733826
a8	-12673.586251
a7	4832.444768
a6	2699.133493
a5	-3474.882785
a4	1326.159178
a3	-163.994797
a2	-11.501799
a1	-0.457249
a0	1.003540

Detection List

Table A-4 provides the list of detections observed by the TIRA radar during the 2006 campaign. A determination of correlation between detections and known, or cataloged, objects was not provided by TIRA. Therefore the column showing possible correlations with the US Space Surveillance Network catalog of known objects was produced by NASA using the SATRAK program.

Table A-4. Detections observed by the TIRA radar for the 2006 campaign.

	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1	180	12	1	57.7	923.1	1.056	-37.96	895.8	62.9	0.029	
2	180	12	2	5.9	1449.9	1.182	-29.57	1407.0	55.9	0.042	25649
3	180	12	2	32.9	714.2	2.498	-41.47	693.0	19.5	0.026	
4	180	12	4	50.7	582.3	-0.310	-24.46	565.1	95.2	0.049	28428
5	180	12	8	13.3	1492.7	-0.493	-25.73	1448.5	101.0	0.046	87089
6	180	12	23	23.6	997.6	0.782	-31.07	968.1	69.5	0.040	
7	180	12	24	38.0	705.5	0.391	-41.30	684.6	79.7	0.026	
8	180	12	25	26.0	1573.7	1.383	-17.60	1527.1	48.3	0.126	
9	180	12	27	34.4	1453.0	0.413	-27.06	1410.0	77.5	0.044	6264
10	180	12	28	28.9	708.0	-0.377	-33.77	687.0	96.8	0.035	
11	180	12	32	28.6	813.3	0.406	-32.88	789.2	79.1	0.036	
12	180	12	43	10.3	827.4	0.725	-28.03	802.9	71.6	0.044	82007
13	180	12	44	1.7	1566.3	0.434	-29.77	1519.9	76.6	0.042	
14	180	12	46	53.6	1842.0	0.055	-30.25	1787.4	86.5	0.041	
15	180	12	57	2.1	1511.6	0.024	-29.55	1466.8	87.5	0.043	
16	180	12	57	5.1	603.7	0.589	-45.06	585.9	75.5	0.022	
17	180	13	1	27.5	1302.2	-0.195	-27.27	1263.7	93.1	0.044	
18	180	13	3	9.3	919.7	0.132	-11.54	892.4	85.3	0.286	81096

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
19	180	13	7	15.7	1552.8	0.244	-24.45	1506.8	81.7	0.049	
20	180	13	7	49.4	1708.5	0.496	-11.81	1657.9	74.5	0.276	21186
21	180	13	11	51.2	787.9	-0.530	-14.26	764.6	100.4	0.203	21577
22	180	13	13	25.8	1868.0	0.893	-22.39	1812.7	62.2	0.056	
23	180	13	13	27.8	965.5	0.826	-20.89	937.0	68.5	0.067	29098
24	180	13	19	18.5	1906.5	-2.311	-19.71	1850.0	170.3	0.085	
25	180	13	19	32.0	993.6	0.883	-31.86	964.2	67.0	0.039	
26	180	13	19	34.7	1510.2	-2.514	-19.24	1465.5	172.0	0.093	
27	180	13	21	11.6	732.6	0.373	-40.93	710.9	80.1	0.026	
29	180	13	23	37.1	1088.2	-0.315	-17.85	1055.9	95.9	0.120	81531
31	180	13	27	47.4	779.5	1.478	-38.97	756.5	52.5	0.028	
32	180	13	29	28.7	1704.0	1.336	-19.31	1653.6	48.7	0.092	
33	180	13	31	40.6	313.2	0.013	-55.89	303.9	88.3	0.015	
34	180	13	32	18.3	933.9	0.037	-47.13	906.2	87.5	0.020	
35	180	13	33	12.0	1425.9	0.450	3.81	1383.6	76.6	1.750	6825
37	180	13	45	22.2	951.7	0.146	-33.00	923.5	84.9	0.036	82513
38	180	13	48	48.2	1664.4	-2.270	3.60	1615.1	166.7	1.707	
39	180	13	52	23.9	670.5	1.853	-44.34	650.6	42.5	0.023	
40	180	13	55	38.9	787.9	0.348	-23.75	764.6	80.5	0.052	
42	180	14	2	17.8	798.4	0.514	5.15	774.8	76.6	2.041	10541
43	180	14	2	19.5	671.8	0.767	-46.10	651.9	71.2	0.021	
44	180	14	3	38.7	1026.4	-1.149	2.81	996.1	116.4	1.560	10730
45	180	14	9	33.6	1647.8	0.602	-3.15	1599.0	71.8	0.785	12980
46	180	14	9	34.9	1512.0	0.576	-35.62	1467.2	72.9	0.032	
47	180	14	15	30.5	894.3	0.420	-34.82	867.8	78.6	0.033	7714
49	180	14	25	4.3	646.3	1.010	-35.27	627.2	65.6	0.032	26974
50	180	14	25	41.8	1203.2	-0.108	-15.33	1167.6	90.9	0.177	
51	180	14	25	53.9	1587.6	-0.870	-12.29	1540.6	111.6	0.259	
52	180	14	25	55.3	889.0	0.961	-37.85	862.7	65.5	0.029	
53	180	14	25	56.0	1193.3	2.092	-22.02	1158.0	25.7	0.057	
54	180	14	25	58.6	612.3	1.715	-38.02	594.2	47.4	0.029	
55	180	14	25	59.1	1596.5	1.839	-23.96	1549.2	30.3	0.051	
56	180	14	26	0.7	1489.8	0.382	-23.01	1445.7	78.2	0.055	
57	180	14	26	20.8	1097.3	1.299	-27.82	1064.9	55.0	0.044	
58	180	14	26	31.7	1056.1	-1.004	-25.89	1024.8	112.8	0.045	
59	180	14	27	43.6	788.1	0.848	-33.22	764.8	68.8	0.036	
60	180	14	28	40.9	698.9	-0.325	12.25	678.2	95.6	4.624	26221
61	180	14	29	59.5	325.8	-1.287	-50.05	316.1	115.7	0.018	
63	180	14	41	28.5	1458.0	1.396	-23.32	1414.9	48.9	0.054	25773
64	180	14	43	18.4	1140.0	0.509	-35.16	1106.2	75.8	0.032	82058
65	180	14	46	54.5	882.8	-0.810	-35.44	856.7	107.3	0.032	
66	180	14	47	1.7	878.9	-0.399	-23.66	852.8	97.6	0.052	23233
67	180	14	52	2.8	1171.7	2.569	-29.32	1137.0	30.8	0.043	
68	180	15	7	6.2	1811.3	1.058	-23.43	1757.7	57.3	0.053	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
69	180	15	13	0.7	1060.1	1.959	-27.55	1028.7	33.3	0.044	
70	180	15	20	56.6	1465.2	0.331	47.85	1421.8	79.6	27.583	20741
71	180	15	24	26.1	1566.1	0.441	-3.88	1519.8	76.4	0.722	11882
72	180	15	25	21.3	1456.2	2.142	-25.02	1413.1	22.5	0.047	
73	180	15	32	28.1	1353.1	-1.180	-19.21	1313.1	119.2	0.094	
74	180	15	39	31.4	943.1	1.029	-33.49	915.2	63.5	0.035	
75	180	15	39	45.8	882.0	-0.504	37.66	855.8	100.0	86.231	28637
76	180	15	41	50.5	1025.1	-0.103	-38.27	994.7	90.8	0.028	
77	180	15	42	29.5	853.0	0.904	-28.33	827.8	67.1	0.044	
78	180	15	50	13.1	1364.6	-0.516	-35.82	1324.2	101.3	0.031	
79	180	15	50	23.0	676.7	-0.963	-37.04	656.6	110.1	0.030	
80	180	15	52	6.6	811.4	0.141	-44.20	787.4	85.2	0.023	24944
81	180	15	53	18.6	1053.5	1.005	-19.61	1022.3	63.5	0.087	87180
82	180	15	54	57.7	1717.5	2.178	-22.73	1666.6	26.5	0.056	
83	180	15	55	8.0	1332.0	-0.324	-27.56	1292.5	96.4	0.044	
84	180	16	4	37.8	504.0	0.629	-36.61	489.1	74.9	0.030	
85	180	16	4	37.7	462.6	-1.340	-30.66	448.9	117.8	0.041	
86	180	16	6	35.5	1056.0	-0.634	-36.05	1025.2	103.7	0.031	
87	180	16	10	57.2	922.4	0.746	-21.22	895.5	70.6	0.064	29102
88	180	16	10	57.4	1062.0	0.692	-38.58	1031.0	71.4	0.028	
89	180	16	10	57.7	791.8	0.601	-40.40	768.7	74.5	0.027	
90	180	16	18	43.8	848.8	0.590	-31.10	824.0	74.6	0.040	87948
91	180	16	19	4.2	1533.7	-0.102	-20.63	1489.0	90.8	0.070	81265
92	180	16	30	52.0	313.1	-1.186	-54.82	304.0	113.6	0.015	
93	180	16	34	37.2	986.2	-2.150	-36.51	957.4	148.7	0.030	
94	180	16	41	7.0	880.3	0.842	-22.34	854.6	68.4	0.056	
95	180	16	44	23.8	347.6	0.024	-29.06	337.4	88.0	0.043	
96	180	16	47	25.8	2050.1	0.412	-14.43	1990.3	75.9	0.199	
97	180	16	51	10.1	868.0	-0.714	-27.04	842.7	105.0	0.044	
98	180	16	51	13.3	868.9	-0.554	4.53	843.5	101.3	1.900	19468
99	180	16	51	11.9	732.0	-0.626	-44.05	710.6	102.6	0.023	
100	180	16	51	14.7	731.6	-0.536	-46.27	710.3	100.5	0.021	
101	180	16	52	7.8	1355.9	0.875	-20.55	1316.4	65.2	0.071	
102	180	16	53	51.5	372.2	-0.592	-40.14	361.3	100.9	0.027	
103	180	16	55	30.5	729.6	1.515	-22.36	708.3	51.6	0.056	81496
104	180	16	56	16.5	855.4	-0.459	-27.56	830.4	99.0	0.044	28074
105	180	16	56	30.4	1542.8	0.490	-5.82	1497.8	75.1	0.578	12328
106	180	16	56	31.8	1692.0	0.003	-32.99	1642.6	88.0	0.036	
108	180	16	56	46.6	381.3	0.889	-49.71	370.2	69.6	0.018	29228
109	180	16	59	25.5	990.9	0.421	-34.00	962.0	78.3	0.034	
110	180	17	5	2.7	879.5	-0.557	-25.82	853.9	101.3	0.046	
111	180	17	9	36.1	2035.8	1.578	-13.96	1976.4	35.5	0.211	
113	180	17	15	4.4	1547.5	0.345	-18.37	1502.3	79.0	0.110	
114	180	17	15	12.2	1040.3	-0.959	-39.45	1010.0	111.8	0.027	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
115	180	17	16	42.0	961.1	1.028	-34.43	933.1	63.2	0.034	
116	180	17	18	15.6	968.2	0.318	-23.95	940.0	80.8	0.051	
117	180	17	21	51.8	401.0	0.928	-39.59	389.3	68.6	0.027	
118	180	17	23	34.4	277.1	0.020	-59.37	269.0	88.1	0.013	
119	180	17	28	52.7	1451.7	1.238	-23.65	1409.4	53.8	0.052	
120	180	17	29	3.5	1459.2	1.514	-29.68	1416.6	44.5	0.042	
121	180	17	37	37.6	1454.6	1.241	9.14	1412.2	53.7	3.233	25961
122	180	17	37	52.3	372.0	0.427	-44.94	361.2	79.6	0.022	
123	180	17	38	6.8	395.3	2.332	-39.64	383.8	29.5	0.027	
124	180	17	39	1.9	1511.0	0.665	3.21	1466.9	70.4	1.633	13762
125	180	17	44	13.8	1251.9	1.720	-21.65	1215.4	39.4	0.060	
126	180	17	46	10.3	578.4	0.965	-36.19	561.5	66.8	0.031	
127	180	17	46	25.9	1407.9	-0.435	-23.96	1366.9	99.4	0.051	7085
128	180	17	47	57.9	369.2	0.484	-33.38	358.5	78.4	0.035	
129	180	17	47	59.0	492.3	0.631	-55.53	478.0	74.8	0.015	
130	180	17	50	50.6	343.8	0.038	-52.31	333.8	87.8	0.017	
131	180	17	51	11.7	309.7	0.014	-52.67	300.7	88.3	0.016	
132	180	17	51	34.6	824.5	0.515	23.28	800.4	76.5	16.454	20432
133	180	17	52	21.9	1392.8	-0.839	-29.17	1352.2	110.1	0.043	
134	180	17	55	50.5	1283.8	0.113	-21.35	1246.4	85.4	0.063	
135	180	17	57	58.6	1331.8	-0.207	-28.56	1293.0	93.5	0.044	
136	180	17	59	7.9	824.0	0.661	-39.99	800.0	73.0	0.027	
137	180	18	1	30.4	1487.8	0.472	2.24	1444.4	75.7	1.460	7266
138	180	18	1	28.6	1632.2	0.814	-35.91	1584.6	65.6	0.031	
139	180	18	1	32.1	1632.0	0.575	-30.75	1584.4	72.4	0.041	
140	180	18	3	34.5	612.4	0.244	-41.67	594.5	83.1	0.026	20510
141	180	18	8	2.4	886.8	-0.535	-37.97	860.9	100.8	0.029	13778
142	180	18	17	14.0	1220.9	0.415	-27.35	1185.3	77.9	0.044	
143	180	18	22	15.7	1511.8	-0.604	-21.21	1467.7	104.1	0.064	82466
144	180	18	23	25.3	538.0	1.427	-44.37	522.3	55.7	0.023	
145	180	18	24	58.5	871.0	-0.574	1.02	845.6	101.7	1.270	23828
146	180	18	24	58.8	731.7	-0.272	-46.94	710.3	94.5	0.021	
147	180	18	25	1.2	732.0	-0.476	-44.30	710.6	99.1	0.023	
148	180	18	25	1.4	1002.0	-0.558	-40.03	972.8	101.6	0.027	
149	180	18	25	1.2	732.0	0.027	-51.70	710.6	87.8	0.017	
150	180	18	27	7.9	863.4	0.981	-48.28	838.2	65.0	0.020	
152	180	18	33	36.1	1657.2	1.245	7.44	1608.9	51.9	2.657	1585
153	180	18	34	33.2	1255.3	-0.354	-33.10	1218.7	97.1	0.036	
154	180	18	36	22.6	2051.7	-1.568	-16.49	1991.9	138.7	0.150	
155	180	18	37	38.8	1402.3	-0.926	-35.68	1361.4	112.5	0.032	
156	180	18	38	5.4	371.9	-0.463	-51.11	361.0	98.2	0.018	
157	180	18	38	9.8	378.2	0.215	-35.75	367.1	84.0	0.031	
158	180	18	42	18.2	1510.5	0.652	-21.36	1466.5	70.7	0.063	
159	180	19	1	58.9	801.1	0.861	-28.24	777.7	68.3	0.044	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
160	180	19	7	1.9	850.9	-0.628	8.77	826.0	102.9	3.097	23751
161	180	19	7	5.2	702.0	1.293	-50.00	681.5	57.9	0.018	
162	180	19	11	53.3	1450.1	0.103	19.51	1407.8	85.5	10.666	22034
163	180	19	14	16.2	757.5	-0.717	-23.36	735.4	104.8	0.053	
164	180	19	18	25.9	400.1	0.885	-52.78	388.4	69.5	0.016	
165	180	19	24	19.2	811.5	-0.523	-32.92	787.8	100.4	0.036	
166	180	19	28	12.5	1431.7	0.093	-17.87	1390.0	85.8	0.120	16140
167	180	19	29	31.2	434.4	1.101	-40.81	421.7	64.4	0.026	
169	180	19	46	30.0	937.2	0.674	-3.56	909.9	72.3	0.749	2872
170	180	19	55	51.0	950.3	0.881	-30.11	922.6	67.1	0.042	
171	180	19	56	0.3	1724.7	0.323	-24.96	1674.4	79.2	0.047	
172	180	19	58	29.8	765.0	-0.734	-31.21	742.6	105.2	0.040	
173	180	20	9	57.4	1611.6	0.230	-17.36	1564.6	82.0	0.131	
174	180	20	14	40.3	1362.0	0.634	-25.09	1322.3	71.8	0.047	
175	180	20	15	39.4	2025.4	-0.191	-11.18	1966.3	93.5	0.299	7145
176	180	20	21	2.2	335.2	0.980	-53.38	325.5	67.8	0.016	
177	180	20	21	39.0	392.6	-1.197	-46.33	381.1	114.3	0.021	
179	180	20	27	49.4	341.1	-0.665	-25.58	331.1	102.4	0.046	
180	180	20	33	39.3	1002.5	0.241	-33.19	973.3	82.6	0.036	22006
183	180	20	41	43.6	1601.0	-0.628	-26.16	1554.3	105.0	0.045	12534
184	180	20	44	48.0	703.7	0.769	-22.04	683.2	70.9	0.057	
185	180	20	48	25.1	411.3	2.452	-41.03	399.3	24.4	0.026	
186	180	20	49	3.5	1015.6	1.033	-24.17	986.0	62.7	0.050	81516
187	180	20	53	6.2	1398.7	-0.085	-27.68	1357.9	90.4	0.044	
188	180	20	53	45.9	957.8	0.877	-36.30	929.9	67.1	0.031	
189	180	20	59	49.8	1557.9	0.618	15.30	1512.5	71.5	6.569	20720
191	180	21	11	59.2	840.2	-0.123	-38.44	815.7	91.2	0.028	20436
193	180	21	20	44.4	741.4	0.950	-22.83	719.8	66.4	0.055	
194	180	21	22	28.3	869.8	0.453	-13.05	844.4	77.8	0.236	11288
195	180	21	25	55.4	729.2	1.869	-45.68	707.9	40.8	0.022	
196	180	21	25	55.9	1178.6	-1.558	-38.44	1144.3	129.6	0.028	
198	180	21	31	25.6	793.2	0.738	-16.12	770.1	71.3	0.159	21420
199	180	21	32	19.6	1030.3	0.531	-33.91	1000.2	75.5	0.035	
200	180	21	33	8.0	620.9	-0.370	35.17	602.8	96.6	64.707	28932
202	180	21	36	52.1	1853.2	0.942	-23.77	1799.2	60.5	0.052	
203	180	21	41	34.4	1038.3	0.529	-31.39	1008.0	75.5	0.040	8874
205	180	21	45	33.5	2032.6	0.040	-17.32	1973.3	86.8	0.132	
206	180	21	45	59.1	860.4	0.730	-31.85	835.3	71.2	0.039	19119
207	180	21	46	32.8	310.1	0.867	-52.51	301.1	70.4	0.017	
208	180	21	46	52.2	896.1	0.363	-33.79	870.0	79.9	0.035	8846
209	180	21	49	5.0	888.9	1.617	-30.61	863.0	47.0	0.041	
210	180	21	52	39.5	1445.0	1.353	-28.58	1402.9	50.1	0.044	
211	180	21	55	31.4	1364.9	0.099	-10.41	1325.0	85.7	0.332	28278
212	180	22	0	8.1	1455.5	1.440	-22.04	1413.1	47.1	0.057	81677

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
213	180	22	3	30.5	776.3	0.107	-40.16	753.6	86.0	0.027	
214	180	22	3	47.5	1035.3	0.252	-33.31	1005.1	82.3	0.036	16727
215	180	22	4	4.6	984.5	0.489	-35.91	955.8	76.7	0.031	
216	180	22	7	33.6	1497.8	0.419	-20.88	1454.1	77.1	0.067	10289
217	180	22	13	16.7	1154.5	-0.506	-29.51	1120.8	100.7	0.043	27577
218	180	22	15	42.9	1743.1	1.051	-1.77	1692.3	57.7	0.921	23191
219	180	22	15	50.3	1544.4	0.650	-23.93	1499.4	70.6	0.052	
220	180	22	20	23.8	1589.5	0.653	-18.72	1543.1	70.4	0.103	
221	180	22	24	15.7	360.0	0.856	-51.09	349.5	70.4	0.018	
222	180	22	28	31.7	977.6	1.022	-28.86	949.0	63.2	0.043	
223	180	22	37	23.9	1295.9	-0.012	-26.03	1258.1	88.5	0.045	
224	180	22	39	42.9	1179.0	-0.617	-17.94	1144.6	103.5	0.118	81883
225	180	22	43	1.3	1036.7	-0.220	-29.74	1006.5	93.6	0.042	672
226	180	22	54	56.6	1003.7	-0.329	-31.84	974.4	96.2	0.039	4720
227	180	22	59	17.5	312.1	-0.769	-58.96	303.0	104.5	0.013	
228	180	23	0	32.1	1489.8	-0.042	-27.74	1446.3	89.3	0.044	21785
229	180	23	4	0.8	1025.2	0.249	-34.73	995.3	82.4	0.033	10020
230	180	23	4	20.3	803.4	0.235	-6.20	780.0	83.0	0.553	25342
231	180	23	5	54.4	316.5	0.836	-52.42	307.3	71.0	0.017	
232	180	23	6	5.3	1119.1	0.478	-16.64	1086.5	76.6	0.146	81895
233	180	23	6	24.6	609.3	0.140	-19.06	591.5	85.4	0.096	87014
234	180	23	7	47.1	1033.7	0.293	-31.93	1003.6	81.3	0.038	27819
235	180	23	8	33.2	1289.4	-0.270	-34.36	1251.8	95.0	0.034	21269
236	180	23	9	26.2	641.3	0.154	-23.57	622.6	85.0	0.053	
237	180	23	10	35.3	529.4	0.194	-30.83	514.0	84.3	0.040	
238	180	23	12	17.3	1187.2	0.439	-37.03	1152.6	77.3	0.030	
239	180	23	16	40.3	747.7	-1.466	-28.31	725.9	123.3	0.044	
240	180	23	21	39.7	938.0	0.784	-4.98	910.7	69.6	0.636	22379
241	180	23	22	30.0	1456.0	1.353	-23.04	1413.6	50.0	0.055	
242	180	23	26	8.9	671.5	-1.828	-47.80	651.9	132.8	0.020	
243	180	23	28	21.0	309.9	0.921	-54.64	300.9	69.2	0.015	
245	180	23	35	37.0	791.3	0.410	-39.93	768.2	79.0	0.027	
246	180	23	39	36.3	1610.9	-1.213	-17.87	1563.9	122.1	0.120	
247	180	23	39	56.5	1453.6	1.235	-3.23	1411.2	53.9	0.778	25624
248	180	23	44	54.2	1453.9	-0.002	-27.69	1411.5	88.2	0.044	
249	180	23	48	56.8	972.1	1.085	-36.72	943.8	61.6	0.030	
250	180	23	49	14.0	1016.2	-0.113	-31.79	986.6	91.0	0.039	
251	180	23	50	40.6	1523.9	0.416	-2.17	1479.5	77.1	0.879	15622
252	180	23	51	48.3	482.5	0.589	-30.39	468.4	75.8	0.041	
253	180	23	51	47.7	341.8	0.782	-58.10	331.9	72.1	0.013	
254	181	0	2	8.3	1787.2	1.133	-24.35	1735.1	54.7	0.050	
255	181	0	3	15.7	913.2	0.374	-18.29	886.6	79.6	0.111	
257	181	0	6	30.3	708.8	0.597	-24.10	688.1	74.9	0.051	
258	181	0	16	58.9	1246.0	-0.830	-21.52	1209.7	109.3	0.062	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
259	181	0	18	23.3	1024.4	0.393	-25.18	994.6	78.9	0.047	87463
260	181	0	18	42.7	1730.0	0.004	-30.19	1679.6	88.0	0.042	
261	181	0	27	22.5	1510.6	0.655	-10.55	1466.5	70.6	0.326	10288
262	181	0	47	52.9	304.5	0.961	-56.61	295.6	68.3	0.014	
263	181	0	51	41.3	941.7	-0.026	-38.61	914.2	89.0	0.028	
264	181	0	52	58.2	1504.9	0.415	-12.00	1461.0	77.2	0.269	20550
265	181	0	54	25.9	1094.7	-1.260	-37.41	1062.8	120.1	0.029	
266	181	1	8	56.3	1542.6	0.747	-21.15	1497.6	67.9	0.065	
267	181	1	12	32.4	923.4	1.951	-30.61	896.4	35.2	0.041	
268	181	1	15	39.7	1989.4	0.136	-22.72	1931.4	84.1	0.056	
269	181	1	15	18.0	1387.0	0.950	20.43	1346.6	62.9	11.859	26997
270	181	1	20	37.4	1086.0	-0.205	-13.23	1054.4	93.3	0.231	1515
271	181	1	25	42.5	1319.7	0.296	-30.62	1281.3	80.7	0.041	
272	181	1	35	3.4	824.9	0.967	-29.81	800.8	65.5	0.042	
273	181	1	42	27.0	1025.6	0.757	-28.08	995.7	69.9	0.044	4799
274	181	1	49	1.2	594.7	-1.104	-39.13	577.4	113.2	0.028	
275	181	1	49	1.1	1017.2	-1.934	-38.80	987.6	140.5	0.028	
276	181	1	50	31.6	1235.7	0.275	-26.50	1199.6	81.4	0.045	
277	181	1	51	18.8	1482.8	0.209	-11.20	1439.6	82.7	0.299	
278	181	1	51	31.6	801.6	0.769	-0.55	778.2	70.5	1.059	4589
279	181	1	53	1.6	910.5	0.100	-29.58	884.0	86.0	0.042	
280	181	1	55	18.9	843.9	0.123	-19.84	819.3	85.6	0.083	
281	181	1	56	18.0	1297.7	0.280	-0.01	1259.9	81.1	1.127	
282	181	1	59	3.8	1494.5	-0.347	-16.61	1450.9	97.2	0.147	
283	181	2	4	51.5	1542.4	-0.015	-6.13	1497.4	88.6	0.557	
284	181	2	11	33.6	839.5	0.850	-36.50	815.0	68.4	0.030	
285	181	2	17	12.4	1963.3	3.117	-27.10	1906.1	60.3	0.044	
286	181	2	17	41.1	951.3	-0.157	-26.74	923.5	92.0	0.045	
287	181	2	18	54.7	1455.8	1.314	9.31	1413.4	51.3	3.297	25884
288	181	2	20	29.7	1522.5	2.607	-30.91	1478.1	39.9	0.040	
289	181	2	21	1.7	947.9	0.853	-34.93	920.2	67.8	0.033	
291	181	2	26	35.7	817.3	-0.192	-27.11	793.5	92.8	0.044	
292	181	2	27	15.5	1010.7	3.088	-29.56	981.3	45.2	0.042	
293	181	2	27	17.6	554.4	1.388	-39.37	538.2	56.6	0.027	
294	181	2	27	43.5	1463.0	1.288	-30.88	1420.3	52.1	0.040	
296	181	2	29	6.4	952.3	1.077	-24.77	924.6	61.9	0.048	
297	181	2	30	4.0	962.8	0.856	-37.95	934.7	67.6	0.029	
298	181	2	41	3.4	940.2	0.863	-21.00	912.8	67.5	0.066	
299	181	2	49	39.4	1540.4	0.677	-23.79	1495.4	69.9	0.052	11049
301	181	2	55	0.5	1089.6	0.833	-43.44	1057.8	67.6	0.024	
302	181	2	56	40.3	1543.3	0.456	-27.90	1498.3	76.0	0.044	8295
304	181	2	58	55.5	1512.6	0.413	-8.65	1468.5	77.2	0.408	21102
305	181	2	59	25.8	1685.2	0.889	-27.82	1636.0	63.1	0.044	
306	181	3	0	40.4	974.3	0.155	10.56	945.9	84.7	3.807	18312

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
308	181	3	4	43.2	1809.8	0.185	-14.22	1757.0	82.9	0.204	
309	181	3	5	58.2	994.0	1.237	-36.16	965.0	57.3	0.031	
310	181	3	6	44.4	969.2	1.217	-31.91	940.9	58.0	0.038	
311	181	3	6	54.8	971.6	1.266	-27.13	943.2	56.6	0.044	
313	181	3	19	21.4	788.0	0.849	-16.18	765.0	68.6	0.158	461
314	181	3	25	12.1	1267.0	-2.307	-25.43	1230.1	162.0	0.046	
315	181	3	25	52.5	300.8	0.005	-58.71	292.0	88.5	0.013	
316	181	3	27	30.9	770.3	0.674	-41.17	747.8	72.9	0.026	6324
317	181	3	31	50.0	903.0	0.829	-36.86	876.6	68.6	0.030	130
318	181	3	36	33.7	1661.5	-0.356	-20.38	1613.1	97.7	0.074	
319	181	3	36	52.2	606.9	0.237	-35.72	589.2	83.2	0.032	16262
320	181	3	39	25.8	964.6	0.936	-24.82	936.5	65.6	0.048	
321	181	3	40	29.9	944.6	0.164	-22.15	917.0	84.5	0.057	
322	181	3	51	13.3	1025.9	0.429	10.51	996.0	78.0	3.784	19921
323	181	4	6	42.0	1155.7	1.139	-32.72	1122.0	58.9	0.037	
324	181	4	16	1.4	357.1	-0.236	-45.55	346.7	93.4	0.022	
325	181	4	16	3.3	643.0	0.405	-39.55	624.2	79.5	0.027	26998
326	181	4	18	47.4	1554.0	-0.316	-30.02	1508.7	96.5	0.042	
327	181	4	19	20.2	1721.4	-0.518	-19.04	1671.2	102.3	0.097	
328	181	4	20	42.5	1234.5	2.222	-26.27	1198.5	22.5	0.045	
329	181	4	28	23.5	849.0	0.524	-39.04	824.3	76.2	0.028	
330	181	4	40	59.4	1394.7	1.472	-23.24	1354.0	46.6	0.054	
331	181	4	42	54.3	707.3	-0.461	1.54	686.6	98.8	1.347	7857
332	181	4	51	16.9	1356.4	0.402	-24.34	1316.9	77.9	0.050	
333	181	4	59	17.9	921.5	-0.540	-37.27	894.6	101.0	0.029	
334	181	5	1	24.3	821.8	-1.820	-34.57	797.8	134.3	0.033	
335	181	5	7	48.4	1395.3	0.377	-24.83	1354.6	78.5	0.048	
336	181	5	18	2.7	928.8	0.857	-23.33	901.7	67.7	0.054	87394
337	181	5	19	2.0	925.0	1.069	-34.12	898.0	62.3	0.034	
338	181	5	21	27.2	495.0	0.850	-37.50	480.5	69.9	0.029	
339	181	5	23	20.4	978.9	0.169	-33.64	950.4	84.3	0.035	
341	181	5	31	28.7	1003.9	0.383	-38.15	974.6	79.2	0.028	
342	181	5	34	30.6	1419.3	2.319	-32.29	1377.9	27.4	0.038	
343	181	5	46	15.8	835.7	-0.283	-16.76	811.3	94.9	0.144	20858
344	181	5	46	40.1	1329.8	-0.073	-32.97	1291.0	90.1	0.036	1314
345	181	5	46	53.8	1477.0	-0.213	-7.55	1434.0	93.7	0.473	
346	181	5	55	21.8	481.9	3.622	-22.54	467.8	48.7	0.056	
347	181	5	56	49.2	1552.1	1.302	6.45	1506.8	50.9	2.372	25885
348	181	5	56	54.7	734.5	-1.537	-34.34	713.1	125.1	0.034	
350	181	6	1	0.6	959.5	-0.322	-36.71	931.5	95.9	0.030	28326
351	181	6	3	36.0	2050.6	-1.869	-20.59	1990.8	153.2	0.070	
352	181	6	5	11.3	974.9	0.128	-34.68	946.5	85.3	0.033	28993
353	181	6	6	18.8	965.6	0.185	27.57	937.5	84.0	26.965	18820
354	181	6	6	39.7	970.4	0.129	-20.23	942.1	85.3	0.076	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
355	181	6	7	0.3	1302.1	0.068	-22.79	1264.1	86.5	0.056	18534
356	181	6	9	32.0	635.9	-0.365	-5.67	617.4	96.5	0.588	28462
357	181	6	9	49.7	918.2	1.743	-38.23	891.4	42.6	0.028	
358	181	6	13	57.2	1481.0	-1.047	-16.94	1437.8	116.3	0.140	
359	181	6	13	57.2	1827.9	3.335	-13.34	1774.6	63.2	0.228	
360	181	6	16	19.3	1533.1	0.630	4.70	1488.4	71.2	1.939	15821
361	181	6	19	59.2	852.8	-0.304	-23.45	827.9	95.4	0.053	
362	181	6	20	47.8	1304.4	0.069	-30.53	1266.3	86.5	0.041	
363	181	6	20	57.6	1308.7	0.094	-29.08	1270.5	85.8	0.043	
364	181	6	24	3.6	883.9	-0.330	3.61	858.1	96.0	1.710	20852
365	181	6	28	17.3	780.6	-0.410	-40.12	757.8	97.7	0.027	20978
366	181	6	33	1.3	1154.4	3.438	-24.69	1120.7	55.8	0.048	
367	181	6	38	41.2	2000.0	-0.202	-24.00	1941.6	93.8	0.051	
368	181	6	39	41.9	1036.8	1.033	-17.64	1006.6	62.6	0.125	16211
369	181	6	46	48.8	1810.0	0.473	-16.66	1757.2	74.8	0.146	
370	181	6	47	27.4	1228.1	-0.553	-31.94	1192.3	102.1	0.038	
371	181	6	47	57.3	833.6	-1.752	-25.98	809.3	132.3	0.045	
372	181	7	0	23.7	1076.6	-0.600	-30.70	1045.2	102.9	0.041	
373	181	7	5	3.2	1507.2	0.690	-11.31	1463.2	69.7	0.294	16454
374	181	7	8	19.1	1497.1	-1.412	-20.53	1453.5	127.6	0.071	
375	181	7	16	14.7	1031.3	0.112	-1.03	1001.3	85.6	1.003	11327
376	181	7	27	57.4	957.7	-0.611	-35.84	929.8	102.8	0.031	
377	181	7	28	3.8	795.8	0.009	-41.74	772.6	88.2	0.026	25173
379	181	7	29	29.2	859.7	-0.573	-34.32	834.6	101.7	0.034	18513
381	181	7	31	13.1	1601.4	0.654	-3.56	1554.7	70.3	0.749	10930
382	181	7	34	18.3	1010.2	-0.356	-35.12	980.7	96.8	0.032	
383	181	7	37	6.7	994.4	0.837	-33.59	965.4	68.0	0.035	
384	181	7	39	18.7	401.4	1.096	-41.80	389.7	64.8	0.026	
385	181	7	40	15.6	1690.2	0.017	-28.35	1640.9	87.6	0.044	
386	181	7	47	12.2	1051.2	1.811	-30.37	1020.5	38.6	0.041	
387	181	7	49	49.1	954.9	-0.361	-33.10	927.0	96.9	0.036	
388	181	7	50	29.4	1559.8	0.753	-26.78	1514.3	67.7	0.045	
389	181	7	53	20.3	1541.1	0.534	-21.70	1496.1	73.9	0.059	
390	181	7	54	24.1	1818.8	-0.642	-16.59	1765.7	106.0	0.148	
392	181	8	3	24.5	1448.4	1.329	-0.97	1406.2	50.9	1.009	25163
393	181	8	3	43.2	975.0	0.866	-34.11	946.6	67.3	0.034	
395	181	8	8	29.9	1572.7	0.458	-23.09	1526.8	75.8	0.054	17146
396	181	8	9	13.1	1112.2	0.942	-22.34	1079.8	64.6	0.056	10569
397	181	8	12	24.9	1450.5	1.241	-24.15	1408.2	53.7	0.050	
398	181	8	12	35.6	1459.7	1.506	-28.31	1417.2	44.7	0.044	
399	181	8	19	8.1	640.6	0.368	-39.47	622.0	80.3	0.027	11267
400	181	8	19	24.6	413.8	0.030	-37.56	401.8	87.9	0.029	
401	181	8	19	30.2	417.6	0.738	-42.32	405.4	72.7	0.025	29228
402	181	8	21	8.8	1457.8	1.298	-31.65	1415.3	51.8	0.039	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
403	181	8	25	1.4	1738.1	-3.047	-17.03	1687.4	179.3	0.138	
404	181	8	27	25.7	943.3	0.405	-36.03	915.8	78.8	0.031	11963
405	181	8	29	59.8	1606.6	-0.422	-29.05	1559.8	99.4	0.043	
406	181	8	31	52.0	825.0	0.812	-31.74	800.9	69.3	0.039	
407	181	8	32	24.9	613.4	0.498	-32.30	595.5	77.4	0.038	
408	181	8	35	8.9	342.8	1.543	-57.93	332.8	54.4	0.013	
409	181	8	36	9.8	975.4	0.868	-35.77	946.9	67.2	0.031	
410	181	8	41	55.1	1671.8	-0.016	-20.72	1623.1	88.5	0.068	
411	181	8	52	0.4	572.9	0.446	-41.12	556.2	78.7	0.026	
412	181	8	55	19.2	409.6	0.132	-48.52	397.7	85.8	0.019	12848
413	181	8	56	0.8	1000.5	0.843	-32.52	971.3	67.8	0.037	
414	181	9	7	18.6	1993.9	-0.007	-22.86	1935.7	88.2	0.055	
415	181	9	7	24.9	912.5	1.057	-36.46	885.8	62.7	0.030	
416	181	9	14	9.8	703.1	0.389	-33.27	682.6	79.7	0.036	
417	181	9	24	12.5	1541.8	2.169	-16.52	1496.8	24.6	0.149	
418	181	9	27	57.4	1051.2	-0.599	-18.30	1020.6	102.8	0.111	
419	181	9	28	36.3	583.7	-2.182	-38.88	566.6	143.2	0.028	
420	181	9	28	36.7	549.2	2.497	-37.71	533.2	20.5	0.029	
421	181	9	28	36.7	1616.3	-1.014	-19.36	1569.2	116.1	0.091	
424	181	9	34	16.1	865.4	1.049	-34.79	840.2	63.2	0.033	
425	181	9	35	18.3	536.0	0.289	-35.26	520.4	82.2	0.032	12155
426	181	9	35	40.0	735.0	-0.282	4.13	713.6	94.8	1.816	28651
427	181	9	37	16.4	792.8	0.381	-12.39	769.7	79.7	0.256	12779
428	181	9	43	52.5	978.9	0.840	-36.77	950.3	68.0	0.030	
429	181	9	50	47.6	1087.6	-0.237	-22.61	1055.9	94.0	0.056	
430	181	9	51	22.4	882.3	0.878	-18.74	856.6	67.4	0.102	22397
431	181	9	52	25.5	1421.3	0.401	-29.09	1379.8	77.8	0.043	
433	181	9	56	16.6	914.4	-1.322	-30.66	887.7	120.6	0.041	
434	181	9	59	7.2	669.3	-2.545	-34.80	649.8	160.9	0.033	
435	181	10	0	24.0	909.4	0.149	-38.42	882.9	84.9	0.028	
436	181	10	1	9.9	853.8	-0.534	-34.41	828.9	100.8	0.034	5903
437	181	10	2	15.8	1510.3	-0.306	-14.38	1466.2	96.2	0.200	12539
438	181	10	2	27.2	1702.2	0.700	-22.76	1652.5	68.6	0.056	
439	181	10	3	22.6	1153.4	-0.342	-24.12	1119.8	96.7	0.051	
440	181	10	3	38.6	593.0	-0.493	-34.45	575.7	99.3	0.034	
441	181	10	3	43.1	1017.7	0.914	-28.82	988.0	65.9	0.043	21970
442	181	10	4	40.3	935.9	-0.508	-28.24	908.6	100.3	0.044	21689
443	181	10	6	20.4	1541.1	0.409	-29.20	1496.1	77.3	0.043	
444	181	10	7	40.3	999.5	0.453	-36.87	970.4	77.5	0.030	21903
445	181	10	9	20.8	1124.8	-0.954	-33.43	1092.0	112.0	0.035	
446	181	10	10	2.1	912.2	-0.527	-31.96	885.6	100.7	0.038	
447	181	10	10	48.8	1747.4	-0.415	-20.36	1696.4	99.5	0.074	
448	181	10	20	28.1	894.1	-0.351	-30.86	868.0	96.5	0.040	
449	181	10	21	42.6	288.1	0.043	-55.20	279.7	87.7	0.015	

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Table A-4. Detections observed by the TIRA radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
450	181	10	23	4.8	553.3	0.381	-39.36	537.1	80.2	0.027	13153
451	181	10	28	0.6	601.2	0.734	-26.71	583.7	72.1	0.045	4530
452	181	10	28	59.5	282.6	0.058	-58.95	274.4	87.4	0.013	
453	181	10	32	41.9	1871.4	-0.545	-19.08	1816.8	103.4	0.096	
454	181	10	37	14.5	846.6	-0.109	-34.62	822.0	90.9	0.033	
455	181	10	38	45.5	1464.7	0.940	-22.06	1422.0	62.8	0.057	5144
456	181	10	39	2.7	1012.5	0.843	-27.95	982.9	67.7	0.044	
457	181	10	39	27.0	979.0	0.349	15.40	950.5	80.0	6.647	14451
458	181	10	40	57.9	2050.0	1.118	-22.77	1990.2	53.3	0.056	
459	181	10	42	9.8	1033.9	0.837	1.64	1003.8	67.8	1.363	11752
460	181	10	45	49.9	1486.9	0.375	-17.60	1443.5	78.3	0.126	
461	181	10	47	25.0	1779.5	0.051	-14.31	1727.6	86.7	0.202	26025
462	181	10	47	49.1	591.2	0.054	-39.95	573.9	87.3	0.027	
463	181	10	52	2.0	713.9	-0.262	13.47	693.0	94.3	5.322	28932
464	181	11	1	19.0	1233.8	-0.719	-27.20	1197.9	106.3	0.044	
465	181	11	2	24.3	1550.5	-0.551	-24.60	1505.3	102.8	0.049	
466	181	11	2	26.0	875.8	0.091	-36.88	850.2	86.3	0.030	
467	181	11	2	32.6	1277.8	-0.578	-31.83	1240.5	102.8	0.039	
468	181	11	3	49.2	1023.7	-0.323	1.92	993.8	96.0	1.408	10704
469	181	11	5	9.3	1852.4	0.350	-18.26	1798.4	78.2	0.112	
470	181	11	6	51.4	840.5	0.853	-40.54	816.0	68.3	0.026	
471	181	11	8	40.1	1449.8	1.210	-28.24	1407.5	54.7	0.044	26083
472	181	11	13	43.6	372.0	1.560	-52.32	361.1	53.7	0.017	
474	181	11	23	49.3	1568.8	0.368	-21.74	1523.1	78.3	0.058	
475	181	11	29	31.6	1228.1	0.213	-23.86	1192.2	83.0	0.052	19336
476	181	11	29	32.5	971.5	0.124	-17.00	943.2	85.4	0.139	15099
477	181	11	39	0.6	1008.5	1.091	-32.79	979.1	61.2	0.037	
478	181	11	41	38.7	1451.0	1.180	-29.42	1408.7	55.6	0.043	25678
479	181	11	45	4.1	791.2	1.376	-29.89	768.1	55.0	0.042	
480	181	11	45	24.9	1234.5	-0.857	4.91	1198.5	109.9	1.986	
481	181	11	46	26.2	314.3	1.532	-58.40	305.1	54.9	0.013	
482	181	11	46	27.6	1616.1	1.027	-26.56	1569.0	59.3	0.045	
483	181	11	46	28.9	996.5	-0.034	-38.04	967.4	89.1	0.029	
484	181	11	46	32.6	1382.8	-1.559	-24.74	1342.5	131.5	0.048	
485	181	11	46	52.4	1758.6	0.028	-20.01	1707.4	87.3	0.080	
486	181	11	47	15.2	852.1	0.194	-27.34	827.2	83.9	0.044	28972
487	181	11	51	12.9	1624.1	-0.579	-11.28	1576.7	103.7	0.295	10768
488	181	11	51	32.7	795.2	-0.644	-38.35	772.0	103.2	0.028	
489	181	11	51	52.5	588.1	-0.545	-38.97	570.9	100.4	0.028	
490	181	11	57	35.5	1175.6	-0.477	-16.87	1141.3	100.0	0.141	
491	181	12	3	25.3	2051.3	-0.174	-25.70	1991.4	93.0	0.046	
492	181	12	3	47.5	760.1	-0.983	-38.42	738.0	111.1	0.028	
493	181	12	10	17.5	583.0	-0.070	-28.69	566.0	90.0	0.043	
494	181	12	12	7.4	1030.3	0.391	-36.59	1000.3	78.9	0.030	

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Appendix B

Haystack Detection List

System and Campaign Parameters

The following tables list the system and campaign parameters as used for the IADC 2006 campaign.

Table B-1. Instrument parameters used by the Haystack radar for the 2006 campaign.

Instrument Parameters		
Geocentric latitude of sensor	42.62	deg
Geocentric longitude of sensor	-71.49	deg
Geodetic altitude	0.1157	km
Wavelength	0.03	m
Beam width for incoherent integration	0.116	deg
Antenna constant (Gain)	67.2	dB
Transmitted power (peak)	400.0	kW
Pulse period	16.67	msec
Pulse duration	1.638	msec
Desired false alarm time (Marcum)	36000	sec
Number of independent threshold decisions per pulse	12126	
Maximum number of pulses to integrate	16	
Noise equivalent RCS (NRCS)	-65.2	dB m ²
Transmitted power for NRCS	400	kW
Pulse duration for NRCS	1.638	msec
Range for NRCS	1000	km

Table B-2. Campaign parameters for the Haystack radar for the 2006 campaign.

Campaign Parameters		
Campaign Start	05 Jul 2006 12:00 UT	
Maximum range	1885	km
Minimum range	312	km
Azimuth of line of site	90	deg
Elevation of line of site	75	deg
Duration of campaign	24	hrs
Total recorded data	19.5	hrs

Beamshape

The next table contains the coefficients from which the beam intensity loss from a nominal zero dB is calculated.

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The dB loss from the beam center as a function of azimuth angle, az , and elevation angle, el , away from the center, is given by

$$Loss = \sum_{i=0}^2 \sum_{j=0}^{2-i} Coef_{i,j} a^i e^j$$

where i and j are indices for the coefficients and sums but are *exponents* for azimuth and elevation values.

Table B-3. Coefficients for loss factor polynomial fit.

	C0,0	C0,1	C0,2	C1,1	C1,2	C2,2
Haystack	0	-31.16866	-8124.115	-12.03326	-492.5722	-8436.755

Figure B-1 shows the RCS intensity distribution over the center of the Haystack beam.

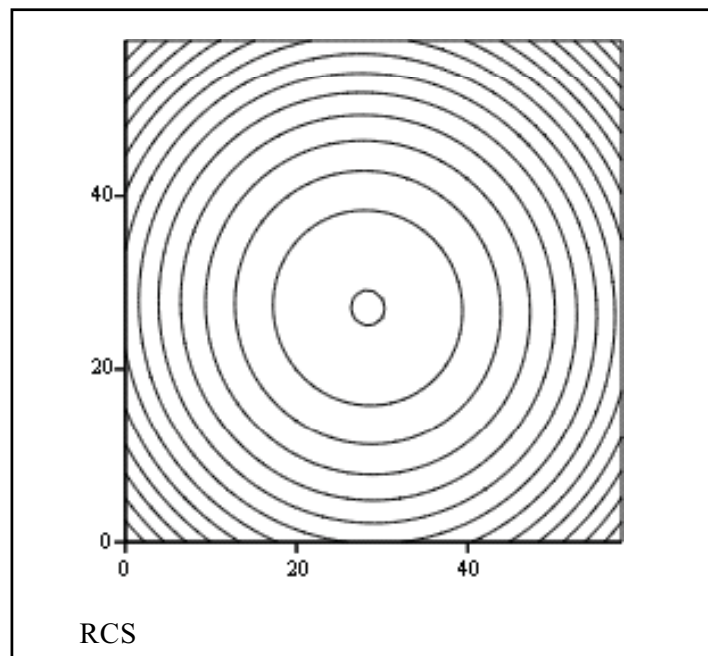


Figure B-1. Haystack RCS intensity distribution over center of beam with 1 dB contours from -0.029° to +0.029°. Geometric center at indices 29,29. Az is x axis, El is y.

Detection List

Table B-4 provides the list of detections observed by the Haystack radar during the 2006 campaign. The column showing possible correlations with the US Space Surveillance Network catalog of known objects was produced by using the SATRAK program.

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Table B-4. Detections observed by the Haystack radar for the 2006 campaign.

	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1	186	12	10	24.2	1210.0	-0.042	-37.81	1176.3	87.8	0.010	
2	186	12	11	58.6	897.9	0.289	-29.82	871.9	79.8	0.035	
3	186	12	26	36.4	1304.6	-0.072	-36.01	1268.7	90.7	0.014	
4	186	12	33	0.0	953.1	0.661	-35.13	925.6	69.8	0.017	
5	186	12	36	9.1	916.4	0.539	-29.70	889.7	73.2	0.035	
6	186	12	38	59.6	1272.2	-0.388	-37.78	1236.9	97.2	0.010	
7	186	12	43	56.6	793.9	0.243	-46.06	770.6	82.3	0.006	
8	186	13	0	27.3	1011.5	-0.519	-41.56	982.6	102.0	0.007	
9	186	13	9	8.1	955.0	0.826	-33.41	927.4	65.2	0.022	
10	186	13	31	16.2	889.1	0.213	-35.19	863.3	81.8	0.017	
11	186	14	31	5.1	1362.9	-0.163	-34.30	1325.6	90.9	0.019	
12	186	14	35	35.4	988.3	-1.662	-45.33	959.8	134.8	0.006	
13	186	14	45	52.5	890.0	0.826	-41.27	864.1	65.6	0.007	
14	186	14	49	19.2	814.6	1.066	-35.28	790.7	60.4	0.016	
15	186	14	54	26.3	1001.1	0.147	-28.77	972.3	84.7	0.040	
16	186	15	0	18.2	1476.3	-0.571	-33.12	1436.5	102.6	0.023	
17	186	15	0	47.5	854.5	1.083	-42.07	829.5	59.6	0.007	
18	186	15	9	59.6	931.9	0.852	-30.93	904.9	65.9	0.030	
19	186	15	11	3.0	853.6	0.098	-33.41	828.6	84.8	0.022	
20	186	15	14	38.4	902.8	0.827	-42.42	876.6	65.6	0.007	
21	186	15	29	48.5	900.3	0.230	-41.13	874.1	81.3	0.007	
22	186	15	35	35.4	1000.1	0.226	-36.50	971.4	81.1	0.013	
23	186	15	38	39.4	1530.1	0.211	-36.01	1489.0	80.1	0.014	
24	186	15	57	28.3	1685.9	1.239	-32.41	1641.5	47.7	0.025	
25	186	16	1	9.1	914.0	0.863	-43.13	887.4	65.6	0.006	
26	186	16	15	48.5	800.1	0.699	-38.85	776.5	69.6	0.008	
27	186	16	19	8.1	896.2	0.831	-34.96	870.1	66.6	0.017	
28	186	16	20	10.1	710.3	-0.407	-30.72	689.2	97.4	0.031	
29	186	16	21	3.0	594.8	-0.393	6.11	576.7	97.5	2.280	26957
30	186	16	31	47.5	518.7	-0.002	-57.76	502.9	87.8	0.004	
31	186	16	36	14.1	850.7	0.772	-18.69	825.9	67.3	0.131	
32	186	16	42	34.3	724.0	0.929	-37.48	702.5	63.9	0.010	
33	186	16	48	22.2	929.2	0.888	-28.97	902.3	63.7	0.039	
34	186	17	21	3.0	1697.2	0.380	-31.39	1652.7	77.5	0.028	
35	186	17	49	12.1	823.3	1.144	-46.42	799.1	58.0	0.006	
36	186	17	51	5.1	777.3	0.168	-38.51	754.3	84.1	0.009	
37	186	18	31	16.2	477.3	1.551	-47.82	462.7	48.4	0.005	
38	186	18	44	5.1	838.6	0.922	-40.53	814.0	63.3	0.007	
39	186	18	50	9.1	1042.1	-0.522	-16.34	1012.3	102.2	0.172	4759
40	186	18	54	5.1	766.1	0.906	-30.26	743.5	64.2	0.033	

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Table B-4. Detections observed by the Haystack radar for the 2006 campaign - Cont.

	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
41	186	18	55	12.1	1142.8	-0.563	-30.93	1110.5	103.7	0.030	
42	186	19	9	34.3	1558.1	0.405	-31.29	1516.3	74.3	0.029	18805
43	186	19	18	3.0	1410.5	0.279	-8.65	1372.2	78.5	0.417	26006
44	186	19	36	6.1	862.3	0.876	-33.94	837.1	65.5	0.020	
45	186	19	59	49.5	1733.8	0.189	-28.03	1688.4	80.2	0.044	
46	186	20	11	31.3	1230.5	-0.809	-31.89	1196.2	109.0	0.027	
47	186	20	30	43.4	1584.7	0.464	-36.59	1542.4	72.5	0.013	
48	186	20	44	33.3	695.2	1.165	-42.93	674.4	58.2	0.006	
49	186	20	46	24.2	1487.9	-0.461	-36.93	1447.9	99.4	0.012	
50	186	20	48	47.5	922.3	0.688	-39.53	895.6	70.5	0.008	
51	186	20	51	56.6	1429.0	1.145	-35.38	1390.3	53.7	0.016	
52	186	21	0	54.5	1559.0	-0.619	-31.19	1517.3	104.2	0.029	
53	186	21	4	58.6	739.4	0.924	-29.72	717.4	63.9	0.035	
54	186	21	11	30.3	874.9	0.901	-39.38	849.3	63.7	0.008	
55	186	21	16	16.2	1381.4	-0.320	-41.62	1343.9	95.3	0.007	
56	186	21	30	26.3	499.1	1.082	-33.98	483.8	61.7	0.020	
57	186	21	35	48.5	957.1	0.906	-29.71	929.4	63.0	0.035	
58	186	22	0	57.6	930.3	0.818	-40.32	903.2	65.6	0.007	
59	186	22	4	26.3	878.9	0.995	-31.62	853.4	61.0	0.028	
60	186	22	5	32.3	833.9	0.858	-30.72	809.6	65.1	0.031	
61	186	22	8	11.1	633.3	-0.458	-48.31	614.2	99.2	0.005	
62	186	22	14	18.2	1554.3	0.517	-34.00	1512.8	73.6	0.020	
63	186	23	4	43.4	839.7	0.854	-32.73	815.1	66.2	0.024	
64	186	23	15	49.5	840.7	-0.499	-33.82	816.1	100.9	0.021	
65	186	23	21	11.1	1341.9	0.031	-36.13	1305.0	85.6	0.014	
66	186	23	22	42.4	1484.3	-0.568	-14.01	1444.3	102.5	0.225	8406
67	186	23	30	0.0	773.3	0.815	-37.88	750.5	66.6	0.010	
68	186	23	53	56.6	1503.4	1.643	-33.62	1463.1	131.4	0.021	
69	187	0	7	20.2	1472.9	-0.308	-30.16	1433.0	97.5	0.033	7092
70	187	0	30	0.0	1269.1	-0.546	-39.28	1233.9	101.6	0.008	
71	187	0	32	23.2	1543.7	0.104	-27.96	1502.4	83.1	0.044	27869
72	187	0	35	14.1	1422.4	0.557	-36.55	1383.8	72.7	0.013	
73	187	0	36	33.3	1543.3	0.098	17.45	1502.0	86.0	8.413	27870
74	187	0	37	38.4	1152.5	1.340	-37.89	1120.2	48.9	0.010	
75	187	0	40	59.6	1034.2	0.147	-37.69	1004.6	84.7	0.010	21875
76	187	0	50	59.6	767.5	0.812	-44.67	744.8	67.7	0.006	
77	187	0	51	18.2	1474.3	0.399	-35.00	1434.5	74.8	0.017	
78	187	2	1	30.3	810.8	0.233	-42.29	786.9	82.5	0.007	
79	187	2	22	11.1	1207.0	0.186	-21.88	1173.4	83.6	0.091	
80	187	2	33	21.2	996.7	0.219	-34.83	968.0	81.3	0.018	

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Table B-4. Detections observed by the Haystack radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
81	187	2	34	35.4	937.4	0.821	-29.64	910.2	65.5	0.035	
82	187	2	39	0.0	959.0	0.852	-37.09	931.2	64.5	0.011	
83	187	2	54	55.6	833.6	0.715	-39.96	809.1	69.0	0.008	
84	187	2	55	8.1	1328.7	-0.509	-33.73	1292.2	100.6	0.021	
85	187	3	14	52.5	437.7	0.044	-55.81	424.2	86.9	0.004	
86	187	3	22	2.0	442.4	0.224	-27.41	428.7	82.7	0.047	
87	187	3	27	29.3	850.0	0.926	-29.74	825.1	63.1	0.035	
88	187	3	34	55.6	920.1	0.666	-29.05	893.5	71.1	0.038	
89	187	3	37	39.4	1008.7	-0.497	-35.11	979.7	99.9	0.017	
90	187	3	38	29.3	709.3	0.576	-33.92	688.1	73.2	0.020	
91	187	3	39	52.5	984.9	0.887	-39.06	956.7	63.3	0.008	
92	187	3	42	56.6	1195.6	0.445	-33.14	1162.1	74.6	0.023	
93	187	3	49	43.4	399.8	1.864	-58.76	387.4	56.7	0.003	
94	187	3	51	6.1	941.0	1.073	-27.23	913.8	58.3	0.048	
95	187	3	55	42.4	946.7	0.867	-36.31	919.3	65.4	0.014	
96	187	4	2	48.5	980.9	0.890	-34.91	952.8	63.3	0.018	
97	187	4	31	18.2	976.1	0.806	-33.37	948.0	65.7	0.022	
98	187	4	40	1.0	768.5	0.988	-37.22	745.8	62.8	0.011	
99	187	4	46	52.5	898.5	0.881	-29.66	872.3	64.1	0.035	
100	187	4	51	30.3	918.5	0.833	-31.26	891.9	65.3	0.029	
101	187	4	52	17.2	810.2	1.107	-28.25	786.4	58.3	0.042	
102	187	5	5	58.6	1059.5	-0.551	-22.94	1029.4	103.0	0.080	
103	187	5	9	36.4	853.7	0.682	-48.17	828.7	70.9	0.005	
104	187	5	15	47.5	827.0	0.859	-50.28	802.7	66.1	0.005	
105	187	5	15	59.6	564.8	-0.440	-33.58	547.6	98.6	0.021	
106	187	5	19	49.5	858.9	0.923	-32.86	833.9	63.2	0.023	
107	187	5	20	2.0	1264.6	1.331	-36.14	1229.5	48.2	0.014	
108	187	5	27	44.4	970.9	0.911	-37.16	942.9	64.0	0.011	
109	187	5	29	7.1	753.7	-0.481	-44.27	731.3	100.2	0.006	
110	187	6	36	44.4	1109.9	0.701	-9.82	1078.4	69.5	0.364	23091
111	187	6	42	2.0	1185.3	-0.520	-30.55	1152.0	102.6	0.032	
112	187	6	52	14.1	646.9	-0.517	-43.06	627.4	100.7	0.006	
113	187	6	53	52.5	1057.1	1.395	-37.18	1027.0	47.9	0.011	
114	187	6	57	32.3	528.5	0.000	-55.17	512.4	88.1	0.004	
115	187	7	3	44.4	637.7	-0.335	-25.68	618.6	96.3	0.059	28499
116	187	7	4	34.3	1018.6	-0.598	-37.09	989.4	102.6	0.011	
117	187	7	6	51.5	938.9	0.874	-28.17	911.7	64.0	0.043	
118	187	7	22	52.5	1103.0	-0.702	-27.15	1071.9	107.3	0.049	
119	187	7	36	19.2	1748.3	0.067	-25.61	1702.7	86.9	0.059	
120	187	7	36	21.2	916.6	0.890	-29.53	890.0	63.7	0.036	

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Table B-4. Detections observed by the Haystack radar for the 2006 campaign - Cont.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
121	187	7	48	38.4	1242.1	0.519	-35.08	1207.5	72.3	0.017	
122	187	7	49	42.4	945.7	-0.093	-35.05	918.2	90.8	0.017	
123	187	7	50	43.4	1286.9	-0.081	-28.93	1251.4	90.9	0.039	
124	187	8	3	18.2	983.7	-0.091	-36.89	955.4	90.8	0.012	
125	187	8	15	20.2	1551.7	-0.505	-31.63	1510.0	100.8	0.028	
126	187	8	17	15.2	1551.8	2.164	-27.27	1510.2	44.3	0.048	
127	187	8	17	41.4	1020.9	0.923	-30.49	991.8	62.1	0.032	
128	187	8	22	18.2	919.0	0.887	-27.88	892.4	63.8	0.045	
129	187	8	33	34.3	1040.9	0.799	-33.89	1011.4	66.9	0.021	
130	187	9	7	11.1	1129.5	1.099	-34.48	1097.7	57.4	0.019	
131	187	9	14	24.2	1540.1	0.518	-33.08	1498.8	71.1	0.023	16594
132	187	9	15	7.1	1708.3	0.036	-28.38	1663.5	87.9	0.042	
133	187	9	16	27.3	965.6	1.307	-30.70	937.7	51.8	0.031	
134	187	9	21	53.5	942.2	0.887	-31.41	914.9	64.9	0.028	
135	187	9	24	49.5	911.6	0.133	-37.11	885.2	83.7	0.011	
136	187	9	28	1.0	910.3	0.871	-28.87	883.9	64.3	0.039	
137	187	9	36	54.5	803.7	0.901	-36.59	780.1	64.1	0.013	
138	187	9	36	56.6	947.1	0.907	-34.25	919.7	63.0	0.020	
139	187	9	39	0.0	991.3	0.287	-39.47	962.7	81.0	0.008	
140	187	9	44	40.4	978.5	0.122	-36.12	950.4	83.9	0.014	
141	187	9	57	56.6	908.1	0.895	-32.76	881.8	63.6	0.024	
142	187	10	21	38.4	967.9	0.821	-38.42	939.9	66.6	0.009	
143	187	10	24	16.2	1036.6	-0.503	-26.92	1006.9	100.1	0.050	
144	187	11	10	10.1	459.3	-0.396	-53.02	445.2	97.1	0.004	
145	187	11	10	40.4	1265.3	-0.374	-33.65	1230.4	96.8	0.021	
146	187	11	16	7.1	852.8	0.876	-33.28	827.9	64.5	0.022	
147	187	11	20	51.5	842.7	0.581	-40.52	818.0	72.5	0.007	
148	187	11	23	19.2	1593.9	-0.542	-28.82	1551.6	101.9	0.039	
149	187	11	32	19.2	994.7	0.803	-35.30	966.3	65.7	0.016	
150	187	11	45	22.2	1760.1	-0.316	-29.15	1714.1	95.3	0.038	
151	187	11	47	18.2	893.9	0.916	-41.35	868.0	63.1	0.007	
152	187	11	50	23.2	1050.7	0.860	-32.52	1020.7	63.7	0.025	
153	187	11	54	4.0	922.9	0.865	-30.59	896.1	64.3	0.031	
154	187	12	0	57.6	1086.9	6.567	-43.19	1056.0	49.9	0.006	

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Appendix C

HAX Detection List

System and Campaign Parameters

The following tables list the system and campaign parameters as used for the IADC 2006 campaign.

Table C-1. Instrument parameters used by the HAX radar for the 2006 campaign.

Instrument Parameters		
Geocentric latitude of sensor	42.62	deg
Geocentric longitude of sensor	-71.49	deg
Geodetic altitude	0.1157	km
Wavelength	0.0167	m
Beam width for incoherent integration	0.2	deg
Antenna constant (Gain)	64.0	dB
Transmitted power (peak)	60.0	kW
Pulse period	16.67	msec
Pulse duration	1.638	msec
Desired false alarm time (Marcum)	36000	sec
Number of independent threshold decisions per pulse	12126	
Maximum number of pulses to integrate	16	
Noise equivalent RCS (NRCS)	-44.5 ?	dB m ²
Transmitted power for NRCS	43.35 ?	kW
Pulse duration for NRCS	1.638	msec
Range for NRCS	1000	km

Table C-2. Campaign parameters for the HAX radar for the 2006 campaign.

Campaign Parameters		
Campaign Start	5 July 2006 12:00 UT	
Maximum range	1885	km
Minimum range	312	km
Azimuth of line of site	90	deg
Elevation of line of site	75	deg
Duration of campaign	24	hrs
Total recorded data	19.6	hrs

Beamshape

The next table contains the coefficients from which the beam intensity loss from a nominal zero dB is calculated.

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The dB loss from the beam center as a function of azimuth angle, az , and elevation angle, el , away from the center, is given by

$$Loss = \sum_{i=0}^2 \sum_{j=0}^{2-i} Coef_{i,j} a^i b^j$$

where i and j are indices for the coefficients and sums but are **exponents** for azimuth and elevation values.

Table C-3. Coefficients for loss factor polynomial fit.

	C0,0	C0,1	C0,2	C1,1	C1,2	C2,2
Haystack	0	-31.16866	-8124.115	-12.03326	-492.5722	-8436.755

Figure C-1 shows the RCS intensity distribution over the center of the HAX beam.

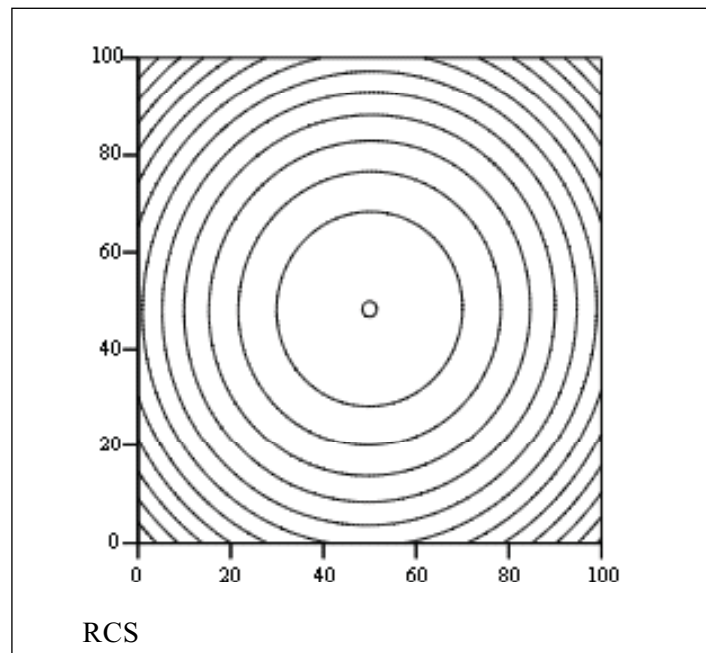


Figure C-1. HAX RCS intensity distribution over center of beam with 1 dB contours from -0.05 to +0.05°. Geometric center at indices 50,50. Az is x axis, El is y.

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Detection List

Table C-4 provides the list of detections observed by the HAX radar during the 2006 campaign. The column showing possible correlations with the US Space Surveillance Network catalog of known objects was produced by using the SATRAK program.

Table C-4. Detections observed by the HAX radar for the 2006 campaign.

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation	
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #	
1	186	12	23	38.38	320.7	-1.81949	-38.49	310.3	131.5	0.012		
2	186	12	24	0.00	311.7	-3.91882	-43.56	301.5	123.7	0.0049		
3	186	12	52	12.12	1508.5	0.52636	8.26	1466.0	74.1	2.9203	14174	#
4	186	16	21	3.03	594.0	-0.39445	17.60	575.3	97.7	8.5587	26957	*
5	186	16	36	14.14	850.5	0.77446	-13.54	824.7	69.1	0.2373		*
6	186	16	48	22.22	836.1	0.89049	-34.32	810.7	66.0	0.0206		*
7	186	18	50	9.09	1040.7	-0.52140	-14.56	1009.7	100.0	0.2112	4759	*
8	186	18	51	0.00	1136.4	-0.07550	-5.11	1103.2	90.9	0.6264	1512	#
9	186	19	18	3.03	1324.3	0.27975	-17.27	1286.5	81.4	0.1545		*
10	186	21	4	58.58	670.0	0.92581	-34.12	649.1	65.8	0.0211		*
11	186	22	48	16.16	987.2	0.22874	14.55	957.6	80.9	6.0217	15516	
12	186	23	21	2.02	1021.4	0.13181	-28.54	990.9	85.5	0.0422	15598	#
13	186	23	22	42.42	1433.0	-0.56862	-15.68	1392.5	101.8	0.1855	8406	*
14	187	0	36	33.33	1542.7	0.09981	11.13	1499.8	86.4	4.066	27870	*
15	187	0	40	25.25	808.9	0.02052	12.40	784.0	86.5	4.7033	24839	#
16	187	0	40	59.59	976.5	0.16444	-29.35	947.2	82.5	0.0385	21875	*
17	187	2	39	40.40	923.4	0.81751	-29.75	895.4	65.8	0.0368		#
18	187	3	22	2.02	474.9	0.22735	-40.43	459.7	83.2	0.0086		*
19	187	4	20	32.32	1077.6	-0.49079	-26.82	1045.8	99.2	0.0514		#
20	187	6	36	44.44	1113.0	0.70701	-12.95	1080.1	70.0	0.2542	23091	*
21	187	6	42	14.14	747.7	0.77930	-32.39	724.5	67.9	0.0264		
22	187	6	42	34.34	677.7	-0.35062	-30.44	656.7	95.5	0.0339		#
23	187	10	50	34.34	1736.2	0.22342	-5.40	1689.2	79.0	0.6061	11085	

* Seen by Haystack simultaneously

Seen by Haystack but outside the ½ power contour

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Appendix D

EISCAT Detection List

Detection List

Table D-1 provides the list of detections observed by the EISCAT radar using the non-coherent pulse-to-pulse integration (NCI) scheme during the 2006 campaign. No attempt at correlating detections with known objects has been made.

Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1	189	11	17	54.0	1214.8	-0.244	-18.13	1179.7		0.140	
2	189	11	18	10.6	876.9	-1.413	-4.01	850.4		0.711	
3	189	11	18	19.5	1529.8	-1.267	-36.28	1487.5		0.060	
4	189	11	19	0.9	526.3	1.135	-48.73	509.6		0.037	
5	189	11	20	56.3	932.6	-1.245	-45.29	904.6		0.042	
6	189	11	21	32.2	1530.7	-1.300	-13.58	1488.3		0.236	
7	189	11	22	27.3	1016.4	1.188	-9.57	986.3		0.375	
8	189	11	22	58.8	1525.0	-1.389	-34.17	1482.8		0.065	
9	189	11	23	53.6	1566.4	-1.201	-17.42	1523.3		0.152	
10	189	11	26	17.3	1502.5	-1.214	-26.83	1460.8		0.086	
11	189	11	26	32.4	1556.5	-1.353	-11.55	1513.6		0.299	
12	189	11	26	38.0	983.3	0.791	7.09	954.0		2.551	
13	189	11	26	52.9	893.1	0.645	-42.98	866.2		0.046	
14	189	11	27	4.9	1555.7	-1.406	-37.17	1512.8		0.058	
15	189	11	27	15.3	1494.3	-1.270	-22.36	1452.7		0.102	
16	189	11	27	27.7	1473.3	1.079	-28.76	1432.2		0.079	
17	189	11	27	46.9	1506.7	-1.307	-18.00	1464.9		0.142	
18	189	11	29	26.1	1545.8	-1.309	-23.62	1503.1		0.097	
19	189	11	29	28.7	1137.8	-1.512	-17.86	1104.6		0.144	
20	189	11	29	46.8	1553.4	-1.367	-30.04	1510.6		0.076	
21	189	11	30	30.9	1574.3	-1.377	-28.53	1530.9		0.080	
22	189	11	31	47.1	1554.8	-1.359	-28.40	1511.9		0.081	
23	189	11	32	33.9	1434.1	1.368	-32.87	1393.9		0.068	
24	189	11	32	52.1	1484.5	-1.308	-30.88	1443.2		0.073	
25	189	11	33	14.0	1010.2	0.589	-21.90	980.3		0.103	
26	189	11	33	40.1	651.5	-0.917	-35.97	631.1		0.060	
27	189	11	33	50.2	1510.0	-1.477	-33.22	1468.2		0.067	
28	189	11	34	49.8	833.3	-0.406	-35.93	808.0		0.060	
29	189	11	35	12.7	1652.7	-1.386	-23.89	1607.7		0.096	
30	189	11	35	14.5	668.4	-1.351	-37.39	647.6		0.057	
31	189	11	35	20.5	1642.6	-1.202	6.46	1597.8		2.374	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
32	189	11	36	4.2	972.3	0.243	-39.69	943.3		0.052	
33	189	11	36	12.4	1564.5	-1.439	-28.30	1521.4		0.081	
34	189	11	36	32.3	856.3	-1.024	-27.79	830.4		0.082	
35	189	11	36	35.7	1534.7	-1.406	-33.26	1492.2		0.067	
36	189	11	36	39.9	850.1	-0.589	-43.09	824.3		0.046	
37	189	11	36	52.6	1289.0	-1.559	-21.88	1252.2		0.103	
38	189	11	37	17.7	1000.0	0.769	-43.21	970.3		0.046	
39	189	11	37	38.9	832.1	-1.072	11.14	806.8		4.070	
40	189	11	38	35.3	1528.6	-1.395	-20.84	1486.3		0.108	
41	189	11	39	38.8	826.6	-1.016	-38.09	801.4		0.056	
42	189	11	42	33.3	1563.8	-1.426	-22.46	1520.7		0.101	
43	189	11	43	29.8	1043.4	0.204	-36.23	1012.6		0.060	
44	189	11	43	32.0	654.1	-1.240	-15.78	633.7		0.183	
45	189	11	43	44.3	876.9	-0.981	-46.43	850.4		0.040	
46	189	11	44	13.3	1498.6	-1.468	-24.17	1457.0		0.095	
47	189	11	44	31.3	515.3	-1.645	-49.95	498.8		0.035	
48	189	11	44	35.3	1554.3	-1.385	-22.21	1511.4		0.102	
49	189	11	44	45.8	502.6	-0.099	-49.59	486.5		0.036	
50	189	11	44	49.2	1365.5	-1.717	-38.61	1326.9		0.054	
51	189	11	44	53.5	505.0	0.730	-45.17	488.9		0.042	
52	189	11	45	11.9	1426.7	0.973	-30.91	1386.7		0.073	
53	189	11	45	27.3	1498.9	0.996	-27.26	1457.2		0.084	
54	189	11	46	35.2	1475.5	-1.405	-31.05	1434.4		0.073	
55	189	11	48	2.6	1577.3	-1.485	-16.44	1533.9		0.170	
56	189	11	48	22.3	1048.5	0.706	6.99	1017.6		2.522	
57	189	11	48	59.5	933.1	1.280	-38.61	905.1		0.054	
58	189	11	49	3.0	1550.4	-1.275	-20.94	1507.6		0.107	
59	189	11	49	53.3	825.3	-1.061	-37.26	800.2		0.057	
60	189	11	49	55.3	1555.1	-1.498	-34.62	1512.2		0.063	
61	189	11	50	48.8	770.6	-1.109	-27.79	746.9		0.082	
62	189	11	51	36.6	1543.4	-1.436	-32.95	1500.7		0.068	
63	189	11	52	0.2	898.7	1.320	-44.62	871.6		0.043	
64	189	11	52	30.8	1066.5	0.800	-33.14	1035.1		0.067	
65	189	11	55	0.9	1614.7	-1.421	-11.34	1570.5		0.306	
66	189	11	56	5.5	2188.4	-1.622	-15.74	2132.6		0.184	
67	189	11	56	5.8	905.7	-1.062	-28.56	878.4		0.080	
68	189	11	56	7.2	2185.7	-1.599	-14.19	2129.9		0.220	
69	189	11	56	20.1	1445.4	-1.506	-26.77	1405.0		0.086	
70	189	11	56	45.7	609.1	-1.292	-34.79	590.0		0.063	
71	189	11	56	49.7	1153.3	-1.173	-29.76	1119.7		0.076	
72	189	11	57	44.1	799.4	1.398	-39.19	775.0		0.053	
73	189	11	58	21.4	1293.9	0.821	-16.09	1257.0		0.177	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
74	189	11	58	33.1	1579.5	-1.359	-12.37	1536.1		0.272	
75	189	11	58	45.4	1499.2	-1.265	-14.92	1457.5		0.203	
76	189	11	58	50.8	779.8	-1.480	-39.54	755.9		0.053	
77	189	11	58	51.6	1491.8	-1.092	-36.54	1450.3		0.059	
78	189	11	58	54.4	774.9	-1.249	-39.99	751.2		0.052	
79	189	11	59	0.3	1628.5	-1.604	-35.67	1584.0		0.061	
80	189	11	59	4.3	1578.0	-1.556	-35.25	1534.6		0.062	
81	189	12	0	10.8	1087.3	-1.523	-34.66	1055.4		0.063	
82	189	12	0	24.2	1564.4	-1.349	-21.11	1521.3		0.107	
83	189	12	2	31.5	880.5	-2.400	-41.07	853.9		0.050	
84	189	12	2	57.2	836.5	-0.986	-18.24	811.1		0.138	
85	189	12	3	8.0	1562.5	-1.484	-10.92	1519.4		0.321	
86	189	12	3	15.6	718.8	-1.336	-42.70	696.6		0.047	
87	189	12	3	17.5	630.2	-0.827	-38.37	610.5		0.055	
88	189	12	3	23.6	713.0	-0.870	-44.68	690.9		0.043	
89	189	12	3	42.9	635.3	1.219	-47.48	615.4		0.039	
90	189	12	3	46.0	711.9	0.752	-30.49	689.8		0.074	
91	189	12	4	36.1	918.4	-1.120	-27.23	890.8		0.084	
92	189	12	4	53.0	1521.4	-1.279	-28.99	1479.3		0.079	
93	189	12	5	59.3	1049.7	0.695	8.52	1018.7		3.008	
94	189	12	6	13.7	1384.0	-1.564	-23.17	1345.0		0.098	
95	189	12	6	39.2	1552.8	-1.456	-31.78	1509.9		0.071	
96	189	12	6	40.6	887.8	-0.220	-45.54	861.0		0.042	
97	189	12	7	26.1	1581.0	-1.487	-25.61	1537.5		0.090	
98	189	12	8	44.6	924.6	1.464	-32.04	896.8		0.070	
99	189	12	8	53.4	1041.2	0.761	-24.58	1010.4		0.093	
100	189	12	8	58.8	853.1	1.069	-45.73	827.2		0.041	
101	189	12	9	2.9	1050.5	1.167	-40.91	1019.5		0.050	
102	189	12	9	36.5	1749.7	-1.235	-14.65	1702.6		0.209	
103	189	12	10	19.9	1016.8	1.124	-5.55	986.6		0.596	
104	189	12	10	30.9	637.7	-1.102	-18.21	617.8		0.139	
105	189	12	11	42.0	1553.5	-1.440	-24.36	1510.6		0.094	
106	189	12	11	47.7	1423.3	-1.265	-29.05	1383.4		0.079	
107	189	12	11	54.5	583.8	-2.160	-44.86	565.4		0.043	
108	189	12	13	54.6	721.3	-1.423	-15.85	699.0		0.182	
109	189	12	14	4.5	1645.2	-1.355	-15.67	1600.3		0.186	
110	189	12	14	13.3	1059.5	0.730	-42.26	1028.3		0.047	
111	189	12	15	30.7	1048.9	1.164	13.33	1017.9		5.235	
112	189	12	16	4.7	936.6	-1.157	-24.30	908.6		0.094	
113	189	12	17	1.8	524.5	0.501	-29.66	507.8		0.077	
114	189	12	17	20.7	1507.0	-1.251	-28.17	1465.2		0.081	
115	189	12	17	47.4	879.7	-1.421	-24.06	853.2		0.095	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
116	189	12	18	29.0	763.1	-1.282	-45.60	739.6		0.042	
117	189	12	20	18.8	874.1	-1.454	-40.45	847.6		0.051	
118	189	12	22	3.3	1714.2	-1.369	-22.49	1667.9		0.101	
119	189	12	22	6.2	1029.2	-1.101	-24.69	998.7		0.093	
120	189	12	22	10.5	1442.6	0.837	-33.26	1402.2		0.067	
121	189	12	22	11.0	1024.2	-0.888	-40.39	993.8		0.051	
122	189	12	22	19.9	1047.7	0.508	-19.53	1016.8		0.119	
123	189	12	22	21.9	1454.0	1.165	-28.96	1413.4		0.079	
124	189	12	22	24.1	1050.3	0.690	-16.99	1019.3		0.160	
125	189	12	22	47.9	1618.6	-1.535	-17.13	1574.3		0.157	
126	189	12	22	56.2	655.3	-1.028	-44.14	634.8		0.044	
127	189	12	23	22.9	950.0	-1.097	-16.02	921.6		0.178	
128	189	12	24	20.6	1048.1	-1.166	-16.80	1017.2		0.163	
129	189	12	24	44.9	721.1	-1.435	-49.81	698.8		0.035	
130	189	12	25	51.3	1502.7	-1.178	-32.76	1461.0		0.068	
131	189	12	25	59.3	591.2	1.430	-49.08	572.5		0.036	
132	189	12	26	13.1	1560.2	-1.485	3.62	1517.1		1.712	
133	189	12	26	43.0	839.6	0.478	-46.95	814.1		0.040	
134	189	12	26	54.3	1637.2	-1.499	-20.81	1592.5		0.108	
135	189	12	27	15.1	578.3	0.121	-43.96	560.0		0.044	
136	189	12	27	42.2	646.3	-1.634	-47.28	626.1		0.039	
137	189	12	27	45.5	947.2	-1.449	-39.69	918.9		0.052	
138	189	12	28	1.8	716.2	0.134	-44.32	694.0		0.044	
139	189	12	28	29.8	1654.5	-1.405	-21.80	1609.4		0.104	
140	189	12	28	41.9	1538.8	-1.508	-18.25	1496.3		0.138	
141	189	12	28	51.0	1784.5	-0.870	-27.38	1736.7		0.084	
142	189	12	29	25.2	706.5	-1.063	-41.07	684.6		0.050	
143	189	12	30	22.6	2367.3	-0.132	-30.45	2308.1		0.074	
144	189	12	30	50.1	1551.3	-1.435	-16.60	1508.5		0.167	
145	189	12	30	50.2	1562.4	-1.445	-16.72	1519.3		0.165	
146	189	12	31	24.2	1588.7	-1.505	-15.37	1545.0		0.192	
147	189	12	31	51.2	1004.1	-0.781	-42.09	974.2		0.048	
148	189	12	32	12.8	998.0	0.205	-44.26	968.4		0.044	
149	189	12	32	22.6	1714.0	-1.358	-27.66	1667.7		0.083	
150	189	12	34	15.4	928.5	-1.206	-21.03	900.6		0.107	
151	189	12	35	3.7	802.7	0.282	5.68	778.2		2.169	
152	189	12	36	33.0	832.1	-1.552	-47.42	806.7		0.039	
153	189	12	36	38.2	1558.1	-1.452	-20.24	1515.2		0.110	
154	189	12	36	38.9	1011.8	-1.579	-27.63	981.8		0.083	
155	189	12	36	39.5	823.5	-1.185	-26.95	798.4		0.085	
156	189	12	36	43.7	1532.8	-1.390	-5.79	1490.4		0.579	
157	189	12	36	51.3	1523.0	-1.196	-28.89	1480.8		0.079	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
158	189	12	36	51.5	813.6	-0.453	-45.66	788.8		0.042	
159	189	12	36	59.5	811.8	0.042	-44.02	787.1		0.044	
160	189	12	37	10.6	1536.1	-1.443	-35.41	1493.7		0.062	
161	189	12	38	40.8	1026.0	1.085	-28.30	995.6		0.081	
162	189	12	38	48.3	737.9	-1.468	-39.79	715.1		0.052	
163	189	12	39	47.6	1566.1	-1.501	-37.03	1522.9		0.058	
164	189	12	40	11.2	1510.0	-1.333	-15.33	1468.1		0.193	
165	189	12	41	25.5	889.4	1.135	-34.42	862.5		0.064	
166	189	12	41	50.1	1583.9	-1.670	-28.66	1540.4		0.080	
167	189	12	41	51.9	769.3	-1.289	-44.14	745.6		0.044	
168	189	12	41	56.9	1574.9	-1.513	-1.55	1531.5		0.944	
169	189	12	42	3.6	1563.6	-1.331	-28.82	1520.6		0.079	
170	189	12	42	24.3	1599.8	-1.545	-16.97	1555.9		0.160	
171	189	12	42	43.2	1619.1	-1.498	-9.81	1574.8		0.365	
172	189	12	43	10.0	923.0	-1.428	-14.06	895.3		0.224	
173	189	12	43	32.0	904.5	-0.264	-46.62	877.3		0.040	
174	189	12	43	37.8	879.3	-1.446	-30.35	852.8		0.075	
175	189	12	44	3.1	1735.2	-1.383	-32.76	1688.4		0.068	
176	189	12	44	24.7	1467.0	-1.542	-21.30	1426.1		0.106	
177	189	12	44	48.7	1720.1	-1.402	-25.49	1673.6		0.090	
178	189	12	44	52.6	1588.5	-1.488	-30.63	1544.9		0.074	
179	189	12	45	43.1	1399.2	-1.429	-33.53	1359.9		0.066	
180	189	12	45	60.0	588.7	-1.188	-26.53	570.1		0.087	
181	189	12	46	28.9	1416.7	0.699	-35.12	1376.9		0.062	
182	189	12	46	30.9	1013.0	0.688	-39.14	983.0		0.053	
183	189	12	46	38.6	1576.1	-1.481	-17.65	1532.7		0.148	
184	189	12	47	12.9	1543.1	-1.413	-23.84	1500.5		0.096	
185	189	12	47	27.1	861.4	1.143	-14.68	835.3		0.208	
186	189	12	47	54.6	823.7	-1.098	-48.10	798.6		0.038	
187	189	12	50	17.3	987.6	0.718	-44.44	958.2		0.044	
188	189	12	51	48.2	1033.5	-0.768	-37.26	1002.9		0.057	
189	189	12	52	28.2	810.7	0.294	-25.96	786.0		0.088	
190	189	12	52	31.0	811.8	0.481	-34.29	787.0		0.064	
191	189	12	52	33.4	1516.7	-1.461	-18.76	1474.6		0.130	
192	189	12	53	40.5	982.8	1.224	-41.50	953.5		0.049	
193	189	12	53	54.6	1200.1	-1.872	-39.34	1165.4		0.053	
194	189	12	54	11.2	912.7	-1.432	-42.76	885.3		0.046	
195	189	12	54	29.2	1434.9	-1.535	-19.22	1394.8		0.123	
196	189	12	54	44.2	1511.4	-1.507	-35.16	1469.5		0.062	
197	189	12	55	47.8	782.7	-0.985	-35.63	758.7		0.061	
198	189	12	55	56.7	1571.6	-1.508	-6.68	1528.3		0.523	
199	189	12	56	45.3	1530.9	-1.412	-25.58	1488.6		0.090	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
200	189	12	57	19.8	1561.3	-1.516	-15.11	1518.3		0.198	
201	189	12	57	22.7	977.2	1.211	-41.66	948.1		0.048	
202	189	12	58	21.5	987.4	1.216	-39.49	958.0		0.053	
203	189	12	58	36.2	625.1	1.330	-47.15	605.4		0.039	
204	189	12	58	43.3	873.8	-1.686	-45.35	847.4		0.042	
205	189	12	59	17.7	1533.4	-1.505	-31.97	1491.0		0.070	
206	189	12	59	44.9	1592.5	-1.466	-24.08	1548.8		0.095	
207	189	12	59	58.0	750.9	0.718	-49.95	727.8		0.035	
208	189	13	1	4.0	1050.5	-1.130	-23.01	1019.5		0.099	
209	189	13	1	39.2	1534.7	-1.498	-18.00	1492.3		0.142	
210	189	13	3	59.9	848.9	0.918	-16.28	823.1		0.173	
211	189	13	4	26.6	1138.0	0.287	-9.06	1104.8		0.398	
212	189	13	4	31.2	1139.7	0.474	-32.00	1106.5		0.070	
213	189	13	4	31.3	1517.8	-1.484	-29.73	1475.7		0.077	
214	189	13	4	31.4	1517.3	-1.476	-29.42	1475.2		0.077	
215	189	13	4	36.5	774.6	-1.956	-4.46	750.8		0.675	
216	189	13	4	37.7	1457.5	-1.484	-31.67	1416.8		0.071	
217	189	13	4	39.6	768.9	-1.743	-26.92	745.2		0.085	
218	189	13	5	18.9	1625.2	-1.572	-11.62	1580.7		0.296	
219	189	13	5	55.6	749.9	-2.592	-46.62	726.8		0.040	
220	189	13	6	14.9	848.9	-1.418	-43.15	823.2		0.046	
221	189	13	6	16.0	709.1	-1.259	-36.63	687.1		0.059	
222	189	13	6	23.9	836.4	-1.371	-22.18	810.9		0.102	
223	189	13	7	58.4	929.9	0.827	-36.19	902.0		0.060	
224	189	13	8	23.5	588.4	-1.487	-31.05	569.8		0.073	
225	189	13	9	11.6	1550.6	-1.509	-18.11	1507.8		0.140	
226	189	13	9	35.3	1034.8	0.692	10.31	1004.2		3.700	
227	189	13	12	1.9	922.7	-1.399	-46.36	895.0		0.040	
228	189	13	12	15.7	1521.7	-1.530	-28.11	1479.5		0.081	
229	189	13	12	19.7	1561.5	-1.473	-32.72	1518.4		0.068	
230	189	13	12	23.4	1676.4	-1.357	-24.08	1630.9		0.095	
231	189	13	13	37.3	1544.5	-1.424	-28.99	1501.8		0.079	
232	189	13	14	25.8	1014.0	0.779	-41.71	984.0		0.048	
233	189	13	14	55.2	1573.2	-1.379	-20.10	1529.9		0.112	
234	189	13	15	13.4	1516.4	-1.324	-30.98	1474.4		0.073	
235	189	13	15	53.8	884.3	-1.150	-45.10	857.6		0.042	
236	189	13	16	45.9	1563.6	-1.514	-25.35	1520.5		0.091	
237	189	13	16	51.6	1500.2	-1.557	-18.40	1458.5		0.136	
238	189	13	17	12.6	1660.0	-1.433	-18.32	1614.8		0.137	
239	189	13	18	1.9	750.1	-1.401	-44.14	727.0		0.044	
240	189	13	19	10.8	1522.5	-1.655	-27.10	1480.3		0.085	
241	189	13	19	11.6	1475.7	-1.534	-28.43	1434.6		0.080	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
242	189	13	19	18.5	1510.2	-1.454	-27.45	1468.3		0.084	
243	189	13	19	37.5	796.8	-0.939	-41.18	772.4		0.049	
244	189	13	19	39.8	1564.5	-1.557	-26.92	1521.4		0.085	
245	189	13	19	48.7	1612.6	-1.517	-27.57	1568.5		0.083	
246	189	13	20	19.1	861.9	-1.308	-46.30	835.7		0.041	
247	189	13	20	38.1	1569.8	-1.679	-25.38	1526.6		0.090	
248	189	13	20	40.4	1058.8	-1.730	-43.61	1027.6		0.045	
249	189	13	20	46.3	1556.8	-1.474	3.34	1513.8		1.657	
250	189	13	21	6.9	825.7	-1.263	-37.30	800.6		0.057	
251	189	13	22	27.5	707.9	-1.139	-33.57	685.9		0.066	
252	189	13	23	14.8	1137.8	-1.347	-37.67	1104.6		0.056	
253	189	13	24	13.2	890.8	-1.446	-42.81	863.9		0.046	
254	189	13	24	48.6	1526.1	-1.460	-37.30	1483.8		0.057	
255	189	13	25	36.7	1652.9	-1.677	-26.05	1607.9		0.088	
256	189	13	25	40.2	1551.8	-1.507	-29.86	1509.0		0.076	
257	189	13	26	56.1	1510.4	-1.524	-31.45	1468.5		0.072	
258	189	13	28	20.1	1593.6	-1.573	-27.17	1549.8		0.084	
259	189	13	28	55.1	786.9	1.402	-23.81	762.8		0.096	
260	189	13	29	50.7	840.4	-1.410	-17.46	814.8		0.151	
261	189	13	31	22.0	1811.7	-1.905	-23.68	1763.3		0.097	
262	189	13	32	26.3	1533.5	-1.562	-16.69	1491.1		0.165	
263	189	13	32	41.8	887.4	1.172	-26.98	860.6		0.085	
264	189	13	32	45.4	1025.1	0.760	-27.57	994.8		0.083	
265	189	13	32	47.2	895.6	1.534	-29.63	868.6		0.077	
266	189	13	32	54.2	1033.7	1.141	-41.12	1003.1		0.049	
267	189	13	33	32.3	1508.1	-1.500	8.41	1466.2		2.971	
268	189	13	34	15.6	1028.6	0.707	-3.70	998.2		0.737	
269	189	13	34	58.9	826.5	1.207	-35.04	801.4		0.062	
270	189	13	35	15.1	1586.2	-1.434	-33.53	1542.6		0.066	
271	189	13	36	35.4	377.7	0.715	-45.04	365.3		0.043	
272	189	13	36	42.3	1007.9	0.713	-21.35	978.0		0.106	
273	189	13	36	59.4	944.5	-1.256	-36.32	916.2		0.059	
274	189	13	37	36.2	1138.2	-1.779	-42.09	1105.0		0.048	
275	189	13	37	55.1	1674.6	-1.369	-32.30	1629.1		0.069	
276	189	13	39	4.9	1655.0	-1.829	-34.01	1610.0		0.065	
277	189	13	39	7.4	1512.6	-1.401	-24.36	1470.6		0.094	
278	189	13	39	17.5	874.6	-1.410	-33.10	848.2		0.067	
279	189	13	39	47.4	1160.6	-1.185	-25.58	1126.9		0.090	
280	189	13	40	16.3	2052.3	2.900	-31.56	1999.1		0.071	
281	189	13	40	19.4	881.8	-1.451	-42.87	855.2		0.046	
282	189	13	40	49.3	1663.2	-1.518	-27.92	1617.9		0.082	
283	189	13	41	58.3	958.9	0.713	-43.85	930.2		0.045	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
284	189	13	42	16.0	876.7	1.363	0.01	850.2		1.130	
285	189	13	42	32.0	959.5	0.820	-44.68	930.8		0.043	
286	189	13	49	16.6	1474.3	-1.470	-31.16	1433.2		0.072	
287	189	13	49	23.9	486.3	0.383	-41.12	470.7		0.049	
288	189	13	49	51.1	706.3	-1.179	-28.08	684.4		0.082	
289	189	13	50	38.9	1156.0	-1.596	-38.42	1122.4		0.055	
290	189	13	51	12.9	887.0	-1.261	-18.15	860.2		0.140	
291	189	13	51	43.5	651.7	-1.479	-42.76	631.3		0.046	
292	189	13	52	48.1	1572.9	-1.489	-12.39	1529.7		0.271	
293	189	13	53	4.1	1612.4	-1.384	-33.10	1568.2		0.067	
294	189	13	53	21.2	1467.2	-1.495	-19.86	1426.2		0.115	
295	189	13	53	34.9	811.5	0.021	-40.50	786.7		0.051	
296	189	13	54	23.5	1811.9	-1.299	-22.23	1763.5		0.102	
297	189	13	55	1.3	1567.1	-1.536	-22.41	1523.9		0.101	
298	189	13	56	53.5	1550.9	-1.546	-18.17	1508.1		0.139	
299	189	13	57	53.6	1031.7	1.362	-26.14	1001.2		0.088	
300	189	13	58	29.9	628.4	-1.380	-46.82	608.6		0.040	
301	189	13	59	39.0	887.4	-1.230	-46.43	860.6		0.040	
302	189	13	59	41.3	1007.0	0.729	-42.81	977.2		0.046	
303	189	13	59	55.3	1530.9	-1.493	-21.35	1488.6		0.106	
304	189	14	0	2.6	1407.6	-1.422	-35.97	1368.0		0.060	
305	189	14	0	25.8	1012.4	-0.788	-39.24	982.4		0.053	
306	189	14	0	27.6	1141.6	-1.230	-38.47	1108.4		0.055	
307	189	14	0	54.6	1622.6	-1.662	-33.85	1578.2		0.065	
308	189	14	1	2.5	1610.6	-1.480	-4.18	1566.5		0.697	
309	189	14	1	46.2	834.3	-1.456	-43.85	808.9		0.045	
310	189	14	3	23.1	1151.6	-1.196	-39.79	1118.1		0.052	
311	189	14	6	41.5	1026.7	0.786	-31.71	996.3		0.071	
312	189	14	7	10.1	802.9	-1.667	-43.21	778.4		0.046	
313	189	14	7	45.7	1516.5	-1.450	-25.41	1474.5		0.090	
314	189	14	9	40.6	810.5	-1.481	-40.97	785.8		0.050	
315	189	14	11	4.7	1152.4	-1.228	-26.71	1118.9		0.086	
316	189	14	12	16.6	1056.1	1.402	-41.93	1025.0		0.048	
317	189	14	12	42.8	1623.9	-1.501	-33.77	1579.5		0.066	
318	189	14	13	8.7	1023.3	0.660	-1.52	993.0		0.947	
319	189	14	14	18.3	1215.9	-1.634	-16.43	1180.8		0.170	
320	189	14	14	24.3	1588.7	-1.454	-33.03	1545.1		0.067	
321	189	14	17	36.3	882.5	-1.352	-45.29	855.8		0.042	
322	189	14	18	33.0	908.7	-1.382	-20.04	881.3		0.112	
323	189	14	19	1.0	1503.4	-1.534	-9.84	1461.7		0.364	
324	189	14	19	57.0	790.5	-1.084	-47.96	766.3		0.038	
325	189	14	20	23.1	1546.5	-1.388	-33.97	1503.8		0.065	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
326	189	14	21	4.3	1023.2	1.137	0.36	992.9		1.176	
327	189	14	21	21.5	1491.0	-1.496	-29.59	1449.6		0.077	
328	189	14	22	18.2	910.6	-1.227	-44.68	883.2		0.043	
329	189	14	22	35.5	898.1	-0.328	-44.62	871.0		0.043	
330	189	14	23	22.1	1010.2	0.925	-27.38	980.2		0.084	
331	189	14	26	6.4	660.9	0.213	-43.09	640.3		0.046	
332	189	14	27	53.1	830.2	-1.410	-28.05	804.9		0.082	
333	189	14	28	40.3	1502.9	-1.542	-23.51	1461.1		0.097	
334	189	14	28	49.2	881.6	-1.220	-45.10	854.9		0.042	
335	189	14	28	57.3	840.6	-1.329	-43.32	815.1		0.045	
336	189	14	29	11.2	1720.6	-0.786	-20.48	1674.1		0.109	
337	189	14	29	24.3	794.7	-0.825	-47.28	770.4		0.039	
338	189	14	30	14.5	692.9	-1.300	-44.26	671.4		0.044	
339	189	14	30	31.7	1534.5	-1.488	-4.05	1492.0		0.708	
340	189	14	30	34.5	987.7	-0.810	-34.50	958.3		0.064	
341	189	14	30	37.5	1526.3	-1.332	-28.43	1484.0		0.080	
342	189	14	31	44.0	1102.9	1.142	-23.59	1070.6		0.097	
343	189	14	32	39.6	1145.4	0.702	-12.81	1112.1		0.258	
344	189	14	33	15.9	1565.2	-1.471	-19.10	1522.1		0.125	
345	189	14	35	22.4	1587.4	-1.577	-29.59	1543.8		0.077	
346	189	14	35	56.9	1165.4	-1.220	-39.84	1131.6		0.052	
347	189	14	36	50.0	1717.3	-0.929	-24.03	1670.9		0.095	
348	189	14	40	21.7	377.4	-0.856	-40.04	365.1		0.052	
349	189	14	40	44.8	849.9	-1.430	-35.08	824.1		0.062	
350	189	14	40	47.2	1035.3	0.651	-40.97	1004.7		0.050	
351	189	14	41	27.6	1001.3	0.741	8.74	971.6		3.086	
352	189	14	44	30.0	1627.8	-1.436	-24.33	1583.3		0.094	
353	189	14	45	59.1	1609.0	-1.464	0.73	1564.9		1.228	
354	189	14	46	44.0	825.2	-1.443	4.45	800.1		1.882	
355	189	14	46	52.3	823.1	-0.915	-47.96	798.0		0.038	
356	189	14	47	25.9	662.6	0.957	-6.86	642.0		0.512	
357	189	14	48	40.4	921.4	1.149	-23.92	893.8		0.096	
358	189	14	50	43.3	667.0	-0.752	-44.08	646.2		0.044	
359	189	14	50	52.0	999.0	1.118	-44.20	969.3		0.044	
360	189	14	52	2.6	1535.9	-1.212	-27.51	1493.5		0.083	
361	189	14	53	34.7	1575.4	-1.482	-24.06	1532.1		0.095	
362	189	14	53	42.0	1348.4	-1.395	-19.17	1310.2		0.124	
363	189	14	55	14.5	704.9	0.269	-16.60	683.0		0.167	
364	189	14	55	47.2	1083.8	-1.686	-39.84	1052.0		0.052	
365	189	14	56	7.7	813.8	0.265	-2.10	789.0		0.886	
366	189	14	56	26.0	787.7	-1.098	-49.66	763.5		0.036	
367	189	14	57	29.1	696.2	-1.048	-46.69	674.6		0.040	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
368	189	14	59	14.4	982.1	-1.179	-17.28	952.9		0.154	
369	189	15	0	40.6	589.5	1.598	-31.38	570.9		0.072	
370	189	15	2	41.8	892.3	1.168	-32.34	865.3		0.069	
371	189	15	2	53.0	711.9	-1.017	-46.69	689.9		0.040	
372	189	15	4	4.3	597.2	1.461	-45.17	578.4		0.042	
373	189	15	4	25.6	960.2	0.692	-14.16	931.5		0.221	
374	189	15	4	35.8	859.8	0.666	-46.89	833.8		0.040	
375	189	15	4	50.6	505.7	-1.445	-49.88	489.5		0.035	
376	189	15	5	17.1	907.2	-1.403	-40.14	879.9		0.051	
377	189	15	5	21.3	804.3	0.545	-46.89	779.8		0.040	
378	189	15	6	37.9	756.8	-0.988	-47.48	733.5		0.039	
379	189	15	8	2.5	759.8	-1.067	-27.57	736.4		0.083	
380	189	15	8	26.9	1027.4	0.960	-33.18	997.0		0.067	
381	189	15	11	3.6	1771.2	-1.431	-14.59	1723.6		0.210	
382	189	15	11	41.0	890.2	-1.235	-8.81	863.3		0.409	
383	189	15	11	43.5	635.1	1.185	-12.58	615.2		0.265	
384	189	15	12	13.2	909.5	-1.732	-42.31	882.1		0.047	
385	189	15	13	51.2	1325.8	0.870	-32.68	1288.1		0.068	
386	189	15	14	55.6	1006.4	1.121	-28.72	976.5		0.080	
387	189	15	16	26.1	1464.8	-1.300	-13.13	1423.9		0.249	
388	189	15	16	57.0	1042.4	-1.488	-19.18	1011.6		0.124	
389	189	15	17	25.0	506.3	1.684	-49.30	490.1		0.036	
390	189	15	17	25.2	552.6	1.224	-49.95	535.0		0.035	
391	189	15	17	54.9	1536.7	-1.675	-36.06	1494.2		0.060	
392	189	15	17	58.7	895.5	-1.485	-40.39	868.5		0.051	
393	189	15	18	1.5	1526.0	-1.507	-26.29	1483.8		0.087	
394	189	15	18	7.3	1517.8	-1.337	-35.80	1475.8		0.061	
395	189	15	18	9.3	882.2	-0.912	-45.79	855.5		0.041	
396	189	15	18	37.2	865.7	-1.411	-41.50	839.5		0.049	
397	189	15	19	2.0	1028.0	0.725	12.18	997.6		4.588	
398	189	15	20	30.7	1450.4	-1.831	-31.97	1409.9		0.070	
399	189	15	20	32.8	805.3	-1.414	-37.21	780.7		0.057	
400	189	15	22	2.2	690.3	-0.959	-41.98	668.9		0.048	
401	189	15	23	21.5	825.8	-1.432	-35.08	800.7		0.062	
402	189	15	23	41.1	666.1	1.239	-27.76	645.3		0.083	
403	189	15	25	37.6	968.8	0.309	-16.87	939.9		0.162	
404	189	15	26	40.7	669.3	1.151	-25.20	648.5		0.091	
405	189	15	28	31.6	1004.7	1.245	-30.49	974.9		0.074	
406	189	15	34	51.9	836.7	-1.538	-47.08	811.3		0.039	
407	189	15	35	7.5	1435.5	-1.452	-37.62	1395.3		0.057	
408	189	15	36	4.4	855.2	-0.689	-27.01	829.3		0.085	
409	189	15	37	59.2	910.2	1.186	-40.14	882.8		0.051	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
410	189	15	38	2.5	1349.7	-1.641	-34.54	1311.5		0.064	
411	189	15	39	0.2	722.1	-1.390	-15.08	699.7		0.199	
412	189	15	40	8.0	1310.6	-0.377	-29.56	1273.2		0.077	
413	189	15	40	17.2	1727.4	0.539	-18.33	1680.8		0.137	
414	189	15	43	0.1	938.0	1.491	-29.22	909.9		0.078	
415	189	15	44	52.3	980.2	1.177	-45.29	951.0		0.042	
416	189	15	45	27.6	880.2	-1.409	-13.29	853.6		0.244	
417	189	15	45	33.5	1297.4	-0.389	-33.65	1260.4		0.066	
418	189	15	45	52.6	1676.3	-1.368	-23.46	1630.7		0.097	
419	189	15	47	26.2	2390.3	-0.593	-28.96	2330.7		0.079	
420	189	15	48	20.6	1063.8	0.820	-41.76	1032.4		0.048	
421	189	15	49	19.8	1306.6	-0.370	-39.29	1269.4		0.053	
422	189	15	49	40.7	848.0	1.010	-48.03	822.2		0.038	
423	189	15	50	16.1	727.0	-1.437	-21.15	704.5		0.106	
424	189	15	51	6.2	838.5	-1.392	-28.56	813.0		0.080	
425	189	15	51	26.9	1274.7	-0.774	-34.09	1238.3		0.065	
426	189	15	52	29.0	822.6	-1.148	-20.94	797.5		0.107	
427	189	15	52	34.6	1316.9	-0.390	-18.57	1279.4		0.133	
428	189	15	53	23.1	1611.3	-1.412	-27.89	1567.2		0.082	
429	189	15	53	44.8	1303.1	-0.369	-29.80	1266.0		0.076	
430	189	15	54	34.6	574.2	-1.323	-4.27	556.0		0.690	
431	189	15	55	19.9	545.9	1.284	-43.96	528.6		0.044	
432	189	15	55	37.6	1540.9	-1.512	-21.55	1498.3		0.105	
433	189	15	56	21.2	1040.3	0.650	-41.33	1009.5		0.049	
434	189	15	57	8.5	847.1	-1.511	-10.73	821.4		0.328	
435	189	15	57	18.5	1350.0	-0.405	-35.25	1311.7		0.062	
436	189	15	57	40.7	1197.9	1.790	-19.41	1163.2		0.121	
437	189	15	58	11.0	1360.1	-0.392	-25.81	1321.6		0.089	
438	189	15	58	14.4	919.6	-0.167	-11.65	891.9		0.295	
439	189	15	59	6.8	1311.4	-0.394	-32.19	1274.1		0.070	
440	189	15	59	10.4	1103.0	-1.521	-20.13	1070.7		0.111	
441	189	16	0	36.9	1407.9	-1.563	-19.96	1368.4		0.113	
442	189	16	1	30.8	1314.2	-0.411	-35.97	1276.8		0.060	
443	189	16	1	53.7	1346.6	-0.410	-38.04	1308.4		0.056	
444	189	16	2	34.7	1328.6	-0.394	-30.73	1290.9		0.074	
445	189	16	3	3.8	1323.7	-0.336	-38.00	1286.1		0.056	
446	189	16	3	37.1	1308.8	-0.368	-32.61	1271.5		0.069	
447	189	16	3	58.1	978.8	-0.825	-35.08	949.6		0.062	
448	189	16	4	20.6	848.0	-1.204	-44.26	822.3		0.044	
449	189	16	4	37.3	836.1	-0.234	-47.22	810.7		0.039	
450	189	16	4	51.9	1328.0	-0.447	-39.94	1290.3		0.052	
451	189	16	5	23.1	1312.2	-0.373	-30.77	1274.9		0.074	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
452	189	16	5	57.7	928.3	1.313	-23.70	900.5		0.096	
453	189	16	6	45.9	698.4	-1.951	-45.66	676.7		0.042	
454	189	16	7	16.8	737.4	-1.324	-42.15	714.6		0.048	
455	189	16	8	49.0	651.2	0.783	-48.65	630.9		0.037	
456	189	16	10	19.4	1660.0	-1.366	-31.05	1614.8		0.073	
457	189	16	11	59.0	1084.9	1.191	-21.11	1053.0		0.107	
458	189	16	12	10.2	1296.1	-0.335	-36.54	1259.2		0.059	
459	189	16	12	24.0	947.3	0.733	8.21	919.0		2.903	
460	189	16	12	54.5	1442.0	-1.699	-36.10	1401.6		0.060	
461	189	16	12	59.2	1002.5	1.172	-26.62	972.7		0.086	
462	189	16	13	0.7	1431.9	-1.508	-10.50	1391.8		0.337	
463	189	16	13	23.3	1141.8	-1.537	-39.29	1108.6		0.053	
464	189	16	14	47.5	912.7	-1.462	-32.38	885.2		0.069	
465	189	16	15	8.0	697.3	-1.188	-38.75	675.7		0.054	
466	189	16	15	13.7	1307.2	-0.380	-29.32	1269.9		0.078	
467	189	16	15	21.1	595.5	1.201	-35.41	576.7		0.062	
468	189	16	15	34.1	987.6	-1.570	-24.47	958.2		0.094	
469	189	16	15	51.5	1658.8	-1.806	-34.17	1613.6		0.065	
470	189	16	16	43.0	1374.2	0.747	-22.41	1335.4		0.101	
471	189	16	17	11.9	1582.0	-1.442	-23.43	1538.5		0.097	
472	189	16	17	33.9	708.1	-1.172	-48.94	686.1		0.037	
473	189	16	17	44.4	1075.7	0.721	-30.14	1044.1		0.075	
474	189	16	18	34.4	1423.2	-1.409	-25.58	1383.3		0.090	
475	189	16	18	37.8	1296.4	-0.372	-31.71	1259.4		0.071	
476	189	16	19	8.5	1639.2	-1.489	-14.33	1594.5		0.217	
477	189	16	22	5.6	1102.7	-1.194	-20.64	1070.5		0.108	
478	189	16	22	30.5	774.0	1.206	-33.07	750.3		0.067	
479	189	16	23	0.2	999.2	0.771	-36.63	969.5		0.059	
480	189	16	24	15.8	1509.7	-1.521	-36.50	1467.8		0.059	
481	189	16	25	9.9	564.4	-1.340	-24.72	546.5		0.093	
482	189	16	28	31.6	2304.2	1.388	-14.73	2246.2		0.207	
483	189	16	30	21.1	1309.3	-0.383	-32.45	1272.0		0.069	
484	189	16	32	15.6	757.5	-1.550	-47.55	734.2		0.039	
485	189	16	32	35.9	368.1	0.151	-40.34	356.0		0.051	
486	189	16	33	44.7	886.4	-1.427	-17.06	859.6		0.158	
487	189	16	36	22.7	692.0	-1.431	-30.45	670.5		0.074	
488	189	16	36	36.8	716.8	-1.352	-35.46	694.6		0.061	
489	189	16	36	41.1	396.5	1.044	-21.62	383.6		0.104	
490	189	16	39	24.6	769.7	0.161	-48.58	746.0		0.037	
491	189	16	39	38.9	1000.0	-0.793	-37.49	970.3		0.057	
492	189	16	40	14.1	714.9	-1.358	-47.48	692.8		0.039	
493	189	16	43	1.6	824.3	-1.538	-47.75	799.2		0.038	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
494	189	16	43	8.8	853.1	-1.399	-15.39	827.3		0.192	
495	189	16	43	47.1	1047.5	-0.306	-32.57	1016.6		0.069	
496	189	16	44	23.0	770.9	-1.380	-47.28	747.3		0.039	
497	189	16	45	36.6	638.2	-1.306	-24.95	618.3		0.092	
498	189	16	47	22.9	633.2	-1.274	-48.51	613.4		0.037	
499	189	16	48	46.3	1085.1	1.015	-21.33	1053.3		0.106	
500	189	16	48	50.3	1002.2	0.764	9.64	972.5		3.422	
501	189	16	51	18.9	836.8	-0.364	-45.85	811.4		0.041	
502	189	16	52	19.9	699.5	1.112	-38.90	677.8		0.054	
503	189	16	54	32.6	1604.9	-1.579	-17.19	1560.9		0.156	
504	189	16	54	48.3	843.9	-0.980	-26.65	818.3		0.086	
505	189	16	55	30.6	1006.7	1.124	-17.09	976.8		0.158	
506	189	16	58	19.0	783.2	-1.311	-49.30	759.2		0.036	
507	189	16	58	31.0	712.4	-1.333	-50.25	690.3		0.035	
508	189	16	59	15.3	578.9	1.050	-47.08	560.6		0.039	
509	189	16	59	35.0	1091.3	-1.532	-19.08	1059.3		0.125	
510	189	16	59	46.5	816.2	0.257	2.67	791.3		1.534	
511	189	17	3	11.3	1452.4	0.597	-16.60	1411.8		0.167	
512	189	17	3	39.0	680.9	2.635	-44.56	659.8		0.043	
513	189	17	5	24.9	925.7	-1.441	-30.14	898.0		0.075	
514	189	17	5	31.7	1023.4	0.779	-28.43	993.1		0.080	
515	189	17	5	49.1	700.1	0.171	-29.66	678.4		0.077	
516	189	17	6	17.4	913.5	-1.597	-23.54	886.1		0.097	
517	189	17	7	23.2	1456.5	0.584	-34.38	1415.8		0.064	
518	189	17	8	6.2	848.3	-1.523	-39.00	822.5		0.054	
519	189	17	11	51.5	1430.5	0.651	-27.01	1390.4		0.085	
520	189	17	15	4.2	966.7	-0.817	-38.66	937.8		0.054	
521	189	17	18	40.4	1100.9	1.268	-35.76	1068.7		0.061	
522	189	17	19	1.9	989.2	0.591	-41.60	959.8		0.049	
523	189	17	20	34.4	1031.2	-1.564	-24.00	1000.7		0.095	
524	189	17	21	6.6	980.1	1.135	-32.53	950.9		0.069	
525	189	17	21	11.0	901.6	1.087	-42.59	874.5		0.047	
526	189	17	21	47.0	1619.1	0.510	-8.75	1574.8		0.412	
527	189	17	22	19.3	565.1	0.351	-49.81	547.2		0.035	
528	189	17	22	44.2	1455.5	0.717	-25.18	1414.9		0.091	
529	189	17	23	0.3	984.3	1.093	-42.37	955.0		0.047	
530	189	17	24	11.1	810.5	-0.712	-40.55	785.8		0.051	
531	189	17	24	34.3	585.6	-1.185	-36.58	567.1		0.059	
532	189	17	25	37.1	926.7	-1.454	-21.48	898.9		0.105	
533	189	17	27	19.7	773.8	1.387	-47.02	750.1		0.039	
534	189	17	27	23.0	798.0	-1.362	-46.69	773.6		0.040	
535	189	17	28	39.3	819.8	0.732	-46.82	794.8		0.040	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
536	189	17	30	13.5	1039.5	0.852	-32.19	1008.8		0.070	
537	189	17	30	24.3	824.2	-0.266	-42.20	799.1		0.047	
538	189	17	30	46.8	1822.7	-1.348	-20.10	1774.0		0.112	
539	189	17	30	52.7	1046.9	-1.478	-24.86	1016.0		0.092	
540	189	17	32	1.7	1431.1	0.686	-35.04	1391.0		0.062	
541	189	17	33	21.4	1420.8	-1.198	-25.23	1380.9		0.091	
542	189	17	35	29.1	875.1	-1.043	-19.49	848.6		0.120	
543	189	17	35	57.3	977.0	1.165	-35.71	947.9		0.061	
544	189	17	35	59.0	905.9	1.198	-18.11	878.6		0.140	
545	189	17	38	33.3	932.9	1.197	-38.23	904.9		0.055	
546	189	17	38	47.8	721.9	-1.378	3.68	699.6		1.723	
547	189	17	39	1.5	1734.7	0.517	-31.20	1687.9		0.072	
548	189	17	39	51.5	595.1	0.976	-43.90	576.3		0.044	
549	189	17	40	44.4	952.4	-1.223	-40.29	923.9		0.051	
550	189	17	40	50.8	1016.7	0.698	-10.44	986.5		0.339	
551	189	17	41	9.0	717.9	0.959	-47.75	695.7		0.038	
552	189	17	41	11.8	757.1	-1.450	-37.39	733.8		0.057	
553	189	17	41	19.5	1651.3	0.944	-16.31	1606.3		0.173	
554	189	17	41	42.6	778.4	-1.416	-44.50	754.6		0.043	
555	189	17	42	33.4	1078.9	0.713	-27.54	1047.2		0.083	
556	189	17	43	9.5	842.3	-2.297	-46.89	816.8		0.040	
557	189	17	43	20.3	820.6	-1.680	-44.20	795.6		0.044	
558	189	17	45	10.9	737.3	-1.266	-23.65	714.6		0.097	
559	189	17	47	15.0	1892.0	-1.040	-33.50	1842.0		0.066	
560	189	17	48	7.5	900.2	-1.218	-39.00	873.1		0.054	
561	189	17	48	35.1	1007.0	1.057	-37.08	977.1		0.058	
562	189	17	48	35.2	909.8	-0.731	-30.91	882.5		0.073	
563	189	17	50	35.6	579.2	-0.776	-44.98	560.9		0.043	
564	189	17	51	57.7	855.6	-1.012	-41.18	829.7		0.049	
565	189	17	52	10.2	829.8	-1.142	-45.10	804.5		0.042	
566	189	17	52	28.4	1063.4	-1.238	-33.61	1032.1		0.066	
567	189	17	52	59.3	1045.7	-1.567	-42.59	1014.8		0.047	
568	189	17	54	5.0	496.5	1.784	-34.99	480.6		0.063	
569	189	17	54	41.9	639.8	-1.204	-46.49	619.8		0.040	
570	189	17	54	59.6	1112.1	-1.450	-42.64	1079.6		0.047	
571	189	17	56	43.1	850.1	-0.960	-45.54	824.3		0.042	
572	189	17	56	47.0	1277.6	-1.404	-21.38	1241.0		0.105	
573	189	17	56	56.2	842.6	-0.196	-45.66	817.0		0.042	
574	189	17	57	5.0	942.3	0.737	-28.50	914.1		0.080	
575	189	17	57	7.5	917.2	0.738	-32.08	889.6		0.070	
576	189	17	57	11.9	643.7	-1.237	-35.93	623.6		0.060	
577	189	17	57	43.5	738.9	-1.655	-46.11	716.1		0.041	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
578	189	17	58	14.8	1020.5	0.737	-27.76	990.3		0.083	
579	189	18	0	11.7	1140.8	-1.418	-21.55	1107.6		0.105	
580	189	18	0	37.5	1715.4	1.085	-18.68	1669.0		0.131	
581	189	18	0	39.2	1425.2	-1.653	-22.59	1385.2		0.101	
582	189	18	2	27.7	909.2	1.189	-17.71	881.9		0.147	
583	189	18	2	36.6	1601.8	-0.833	-16.44	1557.9		0.170	
584	189	18	2	58.9	640.7	-1.711	-43.96	620.7		0.044	
585	189	18	4	10.4	916.1	-1.205	-23.46	888.5		0.097	
586	189	18	5	26.7	1042.1	0.709	-20.22	1011.3		0.110	
587	189	18	6	8.0	857.7	-1.629	-46.43	831.7		0.040	
588	189	18	6	23.4	1586.0	-1.469	-32.68	1542.4		0.068	
589	189	18	6	53.2	677.0	-1.320	-24.86	655.9		0.092	
590	189	18	7	35.6	655.0	-1.002	-36.99	634.6		0.058	
591	189	18	8	0.7	812.9	-0.998	-3.55	788.1		0.750	
592	189	18	8	18.2	1626.4	-1.289	-24.67	1582.0		0.093	
593	189	18	8	34.4	1047.9	0.507	-18.04	1017.0		0.141	
594	189	18	8	40.2	744.1	-1.440	-34.79	721.2		0.063	
595	189	18	8	41.8	1052.9	0.830	-18.42	1021.8		0.135	
596	189	18	9	20.5	599.2	1.412	-33.18	580.3		0.067	
597	189	18	10	22.9	850.1	-1.462	-21.23	824.4		0.106	
598	189	18	10	40.2	1225.3	0.541	-21.80	1190.1		0.104	
599	189	18	12	16.1	798.4	-0.220	-41.23	774.0		0.049	
600	189	18	12	16.6	1022.5	-0.764	-37.67	992.2		0.056	
601	189	18	13	2.8	1475.8	0.608	-35.50	1434.7		0.061	
602	189	18	13	6.0	806.5	-1.142	-45.29	781.9		0.042	
603	189	18	13	23.9	689.6	0.994	-15.33	668.2		0.193	
604	189	18	13	59.6	565.6	-1.453	-47.48	547.7		0.039	
605	189	18	16	39.8	824.5	0.527	-46.95	799.4		0.040	
606	189	18	16	56.0	609.2	-1.350	-39.69	590.1		0.052	
607	189	18	18	8.1	516.4	-0.680	-49.15	499.9		0.036	
608	189	18	22	14.8	760.1	2.489	-50.25	736.7		0.035	
609	189	18	24	20.5	1448.2	0.679	-37.35	1407.7		0.057	
610	189	18	28	6.6	1228.7	1.188	-3.93	1193.3		0.718	
611	189	18	28	21.9	1429.3	0.668	-36.63	1389.3		0.059	
612	189	18	28	28.8	979.3	1.135	-26.35	950.1		0.087	
613	189	18	29	17.8	1468.8	0.532	-37.81	1427.8		0.056	
614	189	18	29	36.1	751.1	-1.538	-50.18	727.9		0.035	
615	189	18	32	18.5	547.7	-0.329	-48.58	530.3		0.037	
616	189	18	32	36.1	562.9	-1.240	-46.43	545.1		0.040	
617	189	18	33	42.9	708.3	0.572	-39.99	686.4		0.052	
618	189	18	33	53.8	965.3	-3.529	-41.50	936.4		0.049	
619	189	18	35	16.9	652.6	-1.407	-36.14	632.2		0.060	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
620	189	18	36	38.0	779.1	-1.462	-22.69	755.2		0.100	
621	189	18	37	37.4	644.9	1.240	0.95	624.7		1.258	
622	189	18	38	8.1	1032.2	0.810	11.60	1001.6		4.289	
623	189	18	40	24.8	1756.5	0.515	-23.54	1709.3		0.097	
624	189	18	42	46.5	1013.3	1.153	-1.50	983.2		0.950	
625	189	18	42	57.6	1761.0	-1.487	-32.87	1713.7		0.068	
626	189	18	44	41.5	1208.6	0.787	-28.53	1173.7		0.080	
627	189	18	45	18.8	1034.2	0.811	-29.56	1003.6		0.077	
628	189	18	45	31.7	641.4	0.786	-38.52	621.3		0.055	
629	189	18	48	20.8	1061.3	-1.506	-36.28	1030.0		0.060	
630	189	18	48	42.8	536.1	-1.341	-15.71	519.0		0.185	
631	189	18	49	27.0	1034.6	-1.535	-37.72	1004.1		0.056	
632	189	18	50	44.0	1005.5	-0.791	-39.19	975.6		0.053	
633	189	18	51	55.7	1013.0	1.147	-38.71	982.9		0.054	
634	189	18	52	38.6	1135.3	-1.184	-29.05	1102.2		0.079	
635	189	18	53	51.9	1147.1	-1.848	-32.30	1113.7		0.069	
636	189	18	54	41.3	500.1	0.029	-35.20	484.1		0.062	
637	189	18	58	29.3	1003.7	0.770	-25.78	973.9		0.089	
638	189	18	58	57.8	416.7	1.357	-29.52	403.2		0.077	
639	189	19	1	18.3	1192.2	-0.927	-29.97	1157.7		0.076	
640	189	19	2	51.0	1433.7	-0.703	-35.20	1393.5		0.062	
641	189	19	3	20.1	1682.9	-4.906	-36.36	1637.2		0.059	
642	189	19	3	23.3	819.4	0.083	-26.44	794.4		0.087	
643	189	19	4	14.0	1175.9	-0.340	-31.71	1141.8		0.071	
644	189	19	4	27.9	1003.4	0.723	-27.76	973.6		0.083	
645	189	19	5	48.4	1615.1	-1.594	-34.70	1570.9		0.063	
646	189	19	6	3.9	1733.8	1.080	-28.76	1687.0		0.079	
647	189	19	6	36.8	812.4	0.276	1.08	787.7		1.278	
648	189	19	7	20.1	685.0	-1.362	-46.89	663.7		0.040	
649	189	19	8	16.3	1097.8	-1.218	-37.53	1065.7		0.057	
650	189	19	8	23.7	1437.5	0.658	-28.37	1397.3		0.081	
651	189	19	10	9.3	995.1	1.143	2.09	965.6		1.436	
652	189	19	10	27.7	1468.8	0.584	-2.14	1427.8		0.882	
653	189	19	10	41.3	1444.6	-1.590	-34.38	1404.2		0.064	
654	189	19	11	13.5	1056.6	1.235	-32.23	1025.5		0.070	
655	189	19	12	36.1	807.4	0.313	-39.00	782.8		0.054	
656	189	19	13	24.2	1058.0	1.292	-23.09	1026.8		0.099	
657	189	19	14	6.7	996.5	1.164	5.21	966.9		2.057	
658	189	19	15	9.6	1289.1	0.512	-32.15	1252.3		0.070	
659	189	19	15	13.4	811.8	-0.680	-25.84	787.1		0.089	
660	189	19	15	15.0	1292.3	0.683	-20.98	1255.4		0.107	
661	189	19	15	21.0	1297.0	0.864	-31.09	1260.0		0.073	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
662	189	19	15	21.7	558.7	-1.192	-22.69	541.0		0.100	
663	189	19	15	52.8	764.5	-1.452	-29.56	741.0		0.077	
664	189	19	16	4.2	1009.8	0.732	-4.79	979.8		0.650	
665	189	19	16	49.0	846.1	-1.494	-42.20	820.4		0.047	
666	189	19	16	59.8	1416.1	-0.732	-37.08	1376.3		0.058	
667	189	19	17	13.8	1001.4	1.162	-44.08	971.6		0.044	
668	189	19	17	49.1	2155.1	-1.209	-19.55	2099.9		0.119	
669	189	19	19	4.0	756.0	-1.311	-27.29	732.8		0.084	
670	189	19	20	46.8	1501.3	0.671	-32.72	1459.6		0.068	
671	189	19	21	23.1	994.3	0.333	-40.45	964.8		0.051	
672	189	19	21	31.8	683.2	-1.411	-41.33	661.9		0.049	
673	189	19	21	38.3	1217.2	0.656	-33.18	1182.1		0.067	
674	189	19	23	17.0	759.5	-1.257	-28.59	736.2		0.080	
675	189	19	24	59.8	518.5	-1.334	-40.60	502.0		0.050	
676	189	19	26	34.9	922.7	1.490	-35.71	895.0		0.061	
677	189	19	27	32.0	926.5	-1.137	-40.65	898.7		0.050	
678	189	19	27	49.1	1066.2	1.406	-43.27	1034.9		0.046	
679	189	19	28	2.2	943.8	0.989	-31.97	915.5		0.070	
680	189	19	28	34.9	1473.2	0.588	-9.88	1432.2		0.362	
681	189	19	30	5.1	641.1	1.292	-48.73	621.0		0.037	
682	189	19	31	18.8	936.2	0.805	-46.04	908.1		0.041	
683	189	19	31	28.7	990.2	1.156	-39.79	960.8		0.052	
684	189	19	31	53.8	1633.1	-1.472	-25.90	1588.5		0.089	
685	189	19	32	12.1	1057.1	0.930	-43.55	1026.0		0.045	
686	189	19	32	45.6	689.6	-1.336	-21.15	668.2		0.106	
687	189	19	34	14.8	841.8	-1.499	-47.22	816.2		0.039	
688	189	19	34	25.6	1224.9	1.276	-26.05	1189.6		0.088	
689	189	19	37	25.3	917.0	-1.099	-15.50	889.4		0.190	
690	189	19	37	49.1	986.9	-1.552	-43.27	957.6		0.046	
691	189	19	39	37.0	822.8	-1.094	-39.29	797.8		0.053	
692	189	19	39	39.3	2018.6	-0.876	-26.23	1966.0		0.088	
693	189	19	40	46.8	846.8	-0.936	-40.65	821.1		0.050	
694	189	19	42	53.7	687.6	-1.141	-21.30	666.2		0.106	
695	189	19	44	10.8	1537.3	0.570	-24.58	1494.8		0.093	
696	189	19	45	0.2	1464.1	0.644	-24.19	1423.2		0.095	
697	189	19	47	34.7	1033.1	1.132	-2.71	1002.6		0.826	
698	189	19	47	44.0	833.4	-1.033	-11.48	808.1		0.301	
699	189	19	49	4.5	896.5	1.050	-29.22	869.5		0.078	
700	189	19	49	31.1	941.9	2.343	-45.48	913.7		0.042	
701	189	19	49	38.3	755.8	-0.717	-43.09	732.5		0.046	
702	189	19	51	47.9	1246.5	-1.029	-23.25	1210.7		0.098	
703	189	19	55	18.5	1301.4	1.255	-37.30	1264.3		0.057	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
704	189	19	55	25.1	610.7	0.789	-17.50	591.5		0.151	
705	189	19	58	33.6	646.0	-1.396	-23.33	625.8		0.098	
706	189	19	58	43.7	1117.7	-1.416	-38.85	1085.0		0.054	
707	189	20	2	21.4	1008.0	-1.742	-32.42	978.1		0.069	
708	189	20	4	2.5	1760.8	1.097	-29.86	1713.4		0.076	
709	189	20	5	8.3	868.2	-0.318	-25.78	842.0		0.089	
710	189	20	5	22.3	1045.3	0.598	-39.00	1014.5		0.054	
711	189	20	6	54.5	1491.5	0.551	-26.23	1450.0		0.088	
712	189	20	7	9.1	581.7	1.257	-22.28	563.3		0.102	
713	189	20	8	41.8	1106.8	-1.084	-43.04	1074.4		0.046	
714	189	20	10	23.8	649.7	1.074	-48.44	629.4		0.037	
715	189	20	10	38.3	2180.3	-1.269	-21.70	2124.6		0.104	
716	189	20	12	59.0	1242.4	1.290	-37.72	1206.7		0.056	
717	189	20	13	2.2	907.9	-1.462	-25.78	880.6		0.089	
718	189	20	13	5.5	1251.3	1.488	-4.44	1215.4		0.677	
719	189	20	13	11.4	1260.6	1.670	-37.95	1224.4		0.056	
720	189	20	15	36.8	1081.8	-0.937	-42.37	1050.0		0.047	
721	189	20	16	23.3	923.2	1.494	-28.30	895.5		0.081	
722	189	20	17	34.2	893.3	-1.512	-43.04	866.4		0.046	
723	189	20	18	1.2	1079.9	-1.511	-16.46	1048.1		0.170	
724	189	20	18	8.9	1048.1	1.112	-15.47	1017.2		0.190	
725	189	20	18	23.7	801.7	-1.389	-26.20	777.2		0.088	
726	189	20	18	55.5	772.3	0.825	-47.69	748.6		0.038	
727	189	20	19	13.6	900.0	1.404	-5.57	872.9		0.594	
728	189	20	20	0.4	841.7	0.688	-45.85	816.1		0.041	
729	189	20	20	2.6	1461.4	0.406	-32.30	1420.6		0.069	
730	189	20	20	5.1	845.0	0.976	-45.04	819.3		0.043	
731	189	20	20	8.8	1464.4	0.580	-19.20	1423.5		0.124	
732	189	20	20	14.2	1106.5	-1.182	-16.94	1074.1		0.161	
733	189	20	21	26.9	1073.6	-1.524	-21.85	1042.1		0.104	
734	189	20	21	27.1	817.8	0.731	-26.11	792.9		0.088	
735	189	20	21	30.4	820.5	0.926	-34.46	795.5		0.064	
736	189	20	23	4.1	1335.2	-1.462	-38.56	1297.3		0.055	
737	189	20	23	38.7	808.3	1.406	-41.98	783.6		0.048	
738	189	20	23	49.7	1544.1	1.096	-14.19	1501.5		0.220	
739	189	20	26	38.7	887.0	-1.544	-41.33	860.2		0.049	
740	189	20	29	27.0	945.5	1.205	-32.53	917.2		0.069	
741	189	20	29	28.4	1454.9	-1.476	-28.37	1414.2		0.081	
742	189	20	30	37.2	1212.8	-1.740	-29.09	1177.8		0.078	
743	189	20	32	41.8	776.1	0.664	-47.96	752.3		0.038	
744	189	20	32	56.7	936.5	1.183	-30.73	908.4		0.074	
745	189	20	33	28.6	1639.8	-1.298	-10.14	1595.0		0.351	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
746	189	20	33	38.6	755.6	0.895	-21.80	732.4		0.104	
747	189	20	35	14.1	1046.7	1.147	-4.20	1015.8		0.696	
748	189	20	35	23.8	988.5	-0.249	-43.55	959.1		0.045	
749	189	20	35	35.1	1665.2	-1.240	-21.57	1619.9		0.105	
750	189	20	37	11.1	1032.2	1.159	-0.18	1001.7		1.105	
751	189	20	37	16.0	1038.4	1.367	-27.82	1007.8		0.082	
752	189	20	37	17.7	1680.8	-1.324	-21.72	1635.2		0.104	
753	189	20	38	11.5	1518.7	-0.674	-34.38	1476.6		0.064	
754	189	20	38	13.3	1026.1	0.845	-41.18	995.7		0.049	
755	189	20	38	19.2	665.6	0.846	-27.10	644.9		0.085	
756	189	20	38	23.7	1027.8	0.639	-38.75	997.4		0.054	
757	189	20	40	29.1	829.4	-1.176	-45.92	804.2		0.041	
758	189	20	44	1.0	710.7	-1.373	4.32	688.7		1.856	
759	189	20	46	38.8	1148.3	-1.492	-28.21	1114.9		0.081	
760	189	20	48	15.5	893.1	0.263	-15.80	866.1		0.183	
761	189	20	48	28.6	1721.1	-1.438	-26.23	1674.6		0.088	
762	189	20	48	38.0	736.2	-1.431	-33.69	713.5		0.066	
763	189	20	49	19.1	1907.3	-1.449	-32.80	1857.0		0.068	
764	189	20	53	6.1	594.0	1.481	3.00	575.3		1.594	
765	189	20	54	54.1	654.3	0.830	-48.44	633.8		0.037	
766	189	20	55	60.0	1250.8	-1.475	-14.51	1214.9		0.212	
767	189	20	56	13.7	1045.1	0.647	-20.57	1014.3		0.109	
768	189	20	56	33.7	1627.4	-1.566	-17.43	1582.9		0.152	
769	189	20	56	47.2	755.6	-1.217	-41.98	732.4		0.048	
770	189	20	58	10.1	761.0	1.772	-50.03	737.6		0.035	
771	189	20	59	47.0	809.5	0.249	-25.87	784.8		0.089	
772	189	20	59	50.1	811.3	0.489	-32.83	786.6		0.068	
773	189	20	59	52.6	1027.7	1.216	-22.44	997.3		0.101	
774	189	21	1	54.7	693.0	-1.421	-35.76	671.5		0.061	
775	189	21	6	8.1	988.1	1.154	-40.19	958.7		0.051	
776	189	21	7	36.6	1470.1	0.581	-7.50	1429.1		0.476	
777	189	21	8	11.8	1075.7	1.025	-42.81	1044.0		0.046	
778	189	21	9	22.9	1877.0	-1.474	-26.50	1827.3		0.087	
779	189	21	13	16.2	1173.9	-1.621	-35.58	1139.8		0.061	
780	189	21	13	49.4	757.1	-1.416	-11.58	733.8		0.298	
781	189	21	14	45.4	1012.4	-0.904	-41.07	982.4		0.050	
782	189	21	15	12.0	1406.0	-1.459	-35.93	1366.5		0.060	
783	189	21	16	12.8	809.0	0.123	-28.72	784.3		0.080	
784	189	21	16	48.5	966.5	-1.230	-25.12	937.7		0.091	
785	189	21	17	14.3	1039.7	1.084	-24.33	1009.0		0.094	
786	189	21	17	25.6	1278.0	-0.558	-35.84	1241.4		0.061	
787	189	21	18	34.6	1667.6	-1.564	-33.14	1622.3		0.067	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
788	189	21	18	40.1	998.2	-0.805	-39.89	968.5		0.052	
789	189	21	19	59.6	1212.2	0.668	-29.29	1177.3		0.078	
790	189	21	20	19.4	733.8	0.353	-45.79	711.2		0.041	
791	189	21	21	17.1	1014.5	1.158	3.26	984.4		1.642	
792	189	21	23	58.0	833.5	1.257	-38.85	808.2		0.054	
793	189	21	25	57.2	1499.0	1.257	-34.42	1457.4		0.064	
794	189	21	26	9.3	787.6	-1.464	-16.19	763.5		0.175	
795	189	21	27	35.9	1144.4	-0.391	-30.38	1111.1		0.075	
796	189	21	27	38.1	950.9	-1.623	-34.54	922.4		0.064	
797	189	21	27	41.8	1142.8	-0.154	-30.07	1109.5		0.076	
798	189	21	28	11.1	1485.9	-1.442	-36.72	1444.6		0.059	
799	189	21	28	45.2	1026.0	0.741	-9.62	995.7		0.373	
800	189	21	29	27.8	1144.7	-1.525	-12.66	1111.4		0.263	
801	189	21	30	28.1	1044.5	0.716	0.54	1013.7		1.201	
802	189	21	30	59.6	988.7	0.675	-35.41	959.3		0.062	
803	189	21	32	5.4	1416.8	-1.504	-18.62	1377.0		0.132	
804	189	21	32	31.9	1168.5	-0.878	-30.42	1134.6		0.075	
805	189	21	33	38.4	1561.9	0.497	-28.43	1518.9		0.080	
806	189	21	37	1.9	742.2	-1.103	-45.66	719.4		0.042	
807	189	21	38	14.1	1297.4	1.697	-16.97	1260.4		0.160	
808	189	21	38	39.3	2282.9	1.869	-16.31	2225.2		0.173	
809	189	21	42	28.0	1069.2	0.266	-40.34	1037.7		0.051	
810	189	21	43	49.8	831.3	-1.440	-45.10	806.0		0.042	
811	189	21	45	26.3	1008.0	0.866	-34.34	978.1		0.064	
812	189	21	49	21.4	711.2	-1.180	-48.37	689.2		0.037	
813	189	21	50	41.3	1119.2	-1.549	-37.03	1086.5		0.058	
814	189	21	51	1.5	1480.9	0.725	-31.09	1439.6		0.073	
815	189	21	51	54.9	1114.9	-1.174	-34.13	1082.3		0.065	
816	189	21	52	46.2	1005.9	1.170	-41.76	976.1		0.048	
817	189	21	52	52.5	703.0	-1.264	-36.99	681.2		0.058	
818	189	21	52	54.1	1043.4	1.127	-37.03	1012.6		0.058	
819	189	21	54	23.8	1393.2	-1.701	-18.95	1354.0		0.127	
820	189	21	54	33.9	1008.3	0.242	-41.23	978.4		0.049	
821	189	21	59	26.7	775.0	1.487	-41.76	751.2		0.048	
822	189	22	0	23.5	1154.8	-1.246	-19.55	1121.2		0.119	
823	189	22	1	28.9	1200.0	0.396	-18.55	1165.3		0.133	
824	189	22	2	31.7	1033.8	0.998	-41.44	1003.3		0.049	
825	189	22	4	15.5	1148.7	0.303	-11.45	1115.3		0.302	
826	189	22	7	48.4	1003.4	0.713	-37.53	973.6		0.057	
827	189	22	8	3.2	1552.0	1.120	6.61	1509.1		2.415	
828	189	22	8	39.1	747.5	-1.444	-47.62	724.5		0.039	
829	189	22	8	55.8	1668.4	0.588	-19.16	1623.1		0.124	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
830	189	22	10	53.4	829.8	-1.497	-44.68	804.6		0.043	
831	189	22	11	11.9	1288.0	-0.997	-21.75	1251.3		0.104	
832	189	22	12	45.3	1511.3	-1.407	-31.74	1469.4		0.071	
833	189	22	13	12.7	1544.0	-1.446	-31.60	1501.4		0.071	
834	189	22	14	46.3	774.0	-0.989	-19.81	750.3		0.115	
835	189	22	19	45.1	1025.9	1.025	-43.90	995.5		0.044	
836	189	22	20	28.3	762.0	-1.324	-37.67	738.5		0.056	
837	189	22	20	44.8	1436.3	0.884	-18.66	1396.1		0.132	
838	189	22	22	57.1	1051.8	1.425	-41.98	1020.7		0.048	
839	189	22	25	6.3	822.1	0.762	-39.49	797.0		0.053	
840	189	22	25	18.7	939.0	1.277	-39.64	910.9		0.052	
841	189	22	31	59.5	1539.6	-1.442	-4.87	1497.0		0.644	
842	189	22	32	18.7	1594.9	-1.421	-11.25	1551.1		0.309	
843	189	22	33	10.4	1029.7	1.119	-1.82	999.2		0.915	
844	189	22	33	39.7	817.4	-0.904	-19.07	792.5		0.126	
845	189	22	34	9.5	1050.9	1.207	-42.04	1019.9		0.048	
846	189	22	34	19.2	812.5	0.868	-34.99	787.7		0.063	
847	189	22	34	50.0	1024.4	0.898	-34.70	994.0		0.063	
848	189	22	35	50.6	765.4	-1.619	-30.31	741.9		0.075	
849	189	22	36	4.5	1017.0	-0.210	-42.31	986.9		0.047	
850	189	22	36	26.7	1023.3	0.767	-37.08	993.0		0.058	
851	189	22	37	3.8	748.1	0.913	-35.04	725.0		0.062	
852	189	22	38	12.0	646.8	1.320	-32.61	626.6		0.069	
853	189	22	39	53.0	649.7	-1.318	-40.29	629.4		0.051	
854	189	22	41	3.9	905.2	1.031	5.04	878.0		2.016	
855	189	22	42	32.8	1049.6	1.076	-42.81	1018.6		0.046	
856	189	22	43	11.9	991.6	1.215	-1.75	962.2		0.923	
857	189	22	43	20.2	975.2	0.916	-7.39	946.1		0.482	
858	189	22	45	7.2	1031.8	-1.542	-32.49	1001.3		0.069	
859	189	22	46	38.1	1145.1	-1.459	-15.38	1111.8		0.192	
860	189	22	49	3.4	1799.5	-1.658	-13.15	1751.4		0.248	
861	189	22	50	13.2	910.9	1.135	-19.09	883.5		0.125	
862	189	22	50	42.5	932.7	0.993	-10.17	904.7		0.350	
863	189	22	51	51.5	1305.9	-1.677	-40.29	1268.7		0.051	
864	189	22	52	5.2	1154.0	-1.385	-16.14	1120.5		0.176	
865	189	22	54	12.2	924.1	1.369	-40.34	896.4		0.051	
866	189	22	56	15.0	1773.1	-1.433	-19.59	1725.5		0.118	
867	189	22	57	15.8	1463.6	-1.502	-18.66	1422.7		0.132	
868	189	22	58	16.2	1092.0	-1.227	-14.59	1060.0		0.210	
869	189	22	59	44.1	637.9	0.893	-43.67	618.0		0.045	
870	189	23	0	47.2	571.2	0.953	-29.63	553.1		0.077	
871	189	23	1	1.0	610.5	0.915	-44.92	591.3		0.043	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
872	189	23	1	11.0	633.9	0.889	-35.20	614.0		0.062	
873	189	23	2	19.5	1176.2	-1.072	-18.04	1142.1		0.141	
874	189	23	2	42.8	574.4	0.913	-49.59	556.2		0.036	
875	189	23	2	54.7	856.1	-1.633	-35.54	830.1		0.061	
876	189	23	2	57.3	701.8	-1.146	-31.38	680.1		0.072	
877	189	23	3	41.9	1057.7	-1.113	-6.59	1026.6		0.529	
878	189	23	3	51.7	748.6	0.785	-46.69	725.5		0.040	
879	189	23	5	59.7	1414.6	-1.644	-35.20	1374.9		0.062	
880	189	23	6	3.6	915.9	-1.494	-18.23	888.4		0.138	
881	189	23	6	24.7	584.3	0.179	-47.96	565.8		0.038	
882	189	23	7	11.4	1557.6	-1.152	-26.20	1514.7		0.088	
883	189	23	8	1.4	447.7	1.244	-47.75	433.2		0.038	
884	189	23	8	56.4	967.1	0.117	-43.67	938.2		0.045	
885	189	23	9	23.8	1053.6	-1.102	-5.05	1022.6		0.631	
886	189	23	9	49.7	1143.8	-1.209	-32.27	1110.4		0.069	
887	189	23	14	13.7	669.7	-1.228	-40.34	648.9		0.051	
888	189	23	20	35.3	2392.6	1.679	-17.81	2332.9		0.145	
889	189	23	21	6.8	1446.1	-0.769	-37.03	1405.7		0.058	
890	189	23	22	49.8	1050.9	1.456	-34.70	1019.9		0.063	
891	189	23	23	25.8	1071.2	1.144	-20.29	1039.7		0.110	
892	189	23	23	30.2	1303.1	0.517	-39.44	1266.0		0.053	
893	189	23	24	8.3	932.7	1.510	-32.00	904.8		0.070	
894	189	23	24	41.3	858.1	-1.392	-8.95	832.1		0.403	
895	189	23	25	45.1	712.8	-1.575	-22.38	690.8		0.101	
896	189	23	26	26.7	982.9	-1.579	-10.68	953.6		0.330	
897	189	23	27	6.9	716.4	-0.939	-30.98	694.3		0.073	
898	189	23	28	12.8	1041.0	-1.108	-42.70	1010.3		0.047	
899	189	23	31	18.0	913.9	1.201	-40.86	886.4		0.050	
900	189	23	34	15.7	1485.8	0.181	-35.41	1444.4		0.062	
901	189	23	35	31.9	981.8	1.127	-4.12	952.6		0.702	
902	189	23	36	44.0	960.1	1.226	-44.02	931.4		0.044	
903	189	23	36	55.3	661.1	1.371	-15.90	640.5		0.181	
904	189	23	38	4.6	1314.0	-1.361	-33.46	1276.6		0.066	
905	189	23	38	7.3	1484.6	-1.569	-30.88	1443.3		0.073	
906	189	23	39	20.2	1242.6	-1.499	-26.08	1206.9		0.088	
907	189	23	39	29.4	712.8	0.734	-41.33	690.7		0.049	
908	189	23	40	11.9	1122.0	-1.158	-22.85	1089.3		0.100	
909	189	23	45	5.2	1438.6	0.529	-26.02	1398.3		0.088	
910	189	23	45	24.2	957.7	-0.383	-12.57	929.1		0.266	
911	189	23	47	31.0	1255.0	-1.549	-39.94	1219.0		0.052	
912	189	23	51	30.0	865.2	0.816	-33.14	839.0		0.067	
913	189	23	52	19.8	632.7	-1.187	-23.17	612.9		0.098	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
914	189	23	53	11.0	1540.5	-1.504	-23.54	1497.9		0.097	
915	189	23	53	31.2	1017.9	1.292	-39.54	987.7		0.053	
916	189	23	53	52.6	567.5	-0.980	-46.82	549.5		0.040	
917	189	23	54	7.2	1150.1	-0.978	-22.69	1116.6		0.100	
918	189	23	54	33.5	1020.5	0.156	-43.50	990.2		0.045	
919	189	23	55	13.1	1438.3	-1.062	-24.00	1398.0		0.095	
920	190	0	1	23.2	1524.7	-1.517	-18.80	1482.5		0.130	
921	190	0	8	21.8	1148.4	1.864	-36.54	1115.0		0.059	
922	190	0	9	7.1	1031.3	1.012	-26.17	1000.8		0.088	
923	190	0	9	14.5	1040.0	1.328	-31.38	1009.3		0.072	
924	190	0	9	14.7	1734.6	1.168	-30.24	1687.8		0.075	
925	190	0	9	27.6	1003.4	0.293	-44.74	973.6		0.043	
926	190	0	10	25.5	1451.3	0.634	-16.87	1410.7		0.162	
927	190	0	11	25.5	1305.7	0.801	-40.14	1268.5		0.051	
928	190	0	11	56.4	1045.8	0.755	-42.15	1014.9		0.048	
929	190	0	12	57.8	529.8	1.577	-29.32	513.0		0.078	
930	190	0	14	20.7	1439.6	0.512	-30.35	1399.3		0.075	
931	190	0	14	22.4	708.0	1.290	-28.92	686.1		0.079	
932	190	0	14	29.4	1445.3	0.758	-31.52	1404.9		0.071	
933	190	0	14	35.2	818.9	-1.302	-45.35	794.0		0.042	
934	190	0	14	51.5	1474.1	0.667	-31.56	1433.0		0.071	
935	190	0	15	4.9	870.3	0.664	-44.44	843.9		0.044	
936	190	0	15	31.7	729.1	-1.307	-45.92	706.6		0.041	
937	190	0	17	10.6	1012.8	1.147	7.48	982.8		2.670	
938	190	0	18	7.9	613.7	-0.495	-42.48	594.4		0.047	
939	190	0	23	2.8	1368.7	-0.475	-29.52	1330.0		0.077	
940	190	0	23	16.9	983.8	0.786	-38.14	954.6		0.055	
941	190	0	23	23.7	1064.4	-1.168	-20.41	1033.0		0.109	
942	190	0	23	29.5	1041.2	1.071	-41.55	1010.4		0.049	
943	190	0	23	41.9	1017.8	0.707	-1.92	987.6		0.905	
944	190	0	24	49.8	1283.8	-1.410	-35.76	1247.1		0.061	
945	190	0	28	56.8	1603.3	-1.584	-14.56	1559.4		0.211	
946	190	0	32	14.8	652.1	-0.784	-36.10	631.7		0.060	
947	190	0	32	41.2	577.8	0.979	-6.68	559.5		0.523	
948	190	0	34	48.1	1045.1	1.023	-30.98	1014.2		0.073	
949	190	0	35	10.8	1465.0	0.598	-8.30	1424.1		0.434	
950	190	0	37	55.9	812.0	0.715	-0.87	787.2		1.020	
951	190	0	40	12.2	1124.1	1.157	-42.20	1091.3		0.047	
952	190	0	42	19.5	1450.7	0.653	-31.23	1410.1		0.072	
953	190	0	42	57.1	1478.6	0.531	-18.78	1437.4		0.130	
954	190	0	43	2.7	1193.2	-0.209	-7.06	1158.6		0.501	
955	190	0	44	28.2	992.6	1.084	-28.37	963.1		0.081	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
956	190	0	44	34.8	741.8	-1.439	-34.87	718.9		0.063	
957	190	0	46	3.3	688.9	1.439	-44.14	667.5		0.044	
958	190	0	47	27.0	1077.7	1.151	-28.01	1046.0		0.082	
959	190	0	47	58.5	807.9	-1.428	-44.80	783.2		0.043	
960	190	0	49	47.6	1080.2	-1.025	-44.26	1048.4		0.044	
961	190	0	50	5.0	1051.5	-1.191	-17.45	1020.5		0.151	
962	190	0	51	6.2	1461.0	0.338	-12.54	1420.2		0.266	
963	190	0	51	47.8	981.3	0.268	-43.32	952.1		0.045	
964	190	0	53	3.3	509.2	0.270	-27.92	492.9		0.082	
965	190	0	53	37.0	507.8	0.217	-18.05	491.6		0.141	
966	190	0	53	55.9	1564.3	-1.247	-35.93	1521.2		0.060	
967	190	0	54	21.4	1423.9	-1.489	-29.42	1384.0		0.077	
968	190	0	54	41.6	1137.2	-1.143	-7.28	1104.0		0.488	
969	190	0	54	54.3	1541.4	-1.516	-31.34	1498.8		0.072	
970	190	0	55	56.7	1557.8	0.464	-32.42	1514.8		0.069	
971	190	0	56	13.7	1255.4	-1.179	-27.70	1219.4		0.083	
972	190	1	0	50.6	569.3	1.428	-49.37	551.2		0.036	
973	190	1	3	2.2	947.1	-1.399	1.24	918.8		1.301	
974	190	1	4	0.1	891.1	0.750	-41.12	864.2		0.049	
975	190	1	4	17.6	1557.5	-0.614	9.46	1514.6		3.352	
976	190	1	5	22.0	569.8	-1.441	-39.89	551.8		0.052	
977	190	1	5	54.3	1022.5	1.160	1.38	992.3		1.323	
978	190	1	6	44.8	1486.2	0.733	-34.29	1444.8		0.064	
979	190	1	8	1.8	1076.1	-1.498	-41.33	1044.5		0.049	
980	190	1	9	33.7	1199.1	-0.989	-33.97	1164.4		0.065	
981	190	1	10	8.1	1047.1	1.154	-22.77	1016.2		0.100	
982	190	1	10	27.9	1346.9	-1.534	-38.61	1308.7		0.054	
983	190	1	10	55.9	1465.2	0.612	3.97	1424.3		1.781	
984	190	1	13	10.1	1198.9	0.781	-34.21	1164.3		0.064	
985	190	1	13	27.9	1062.2	1.400	-43.38	1030.9		0.045	
986	190	1	14	12.5	1078.6	1.192	-32.99	1046.9		0.068	
987	190	1	14	20.0	1436.1	0.883	-28.50	1395.9		0.080	
988	190	1	14	42.1	797.5	0.927	-43.38	773.1		0.045	
989	190	1	15	28.0	1047.0	0.275	-18.66	1016.1		0.132	
990	190	1	17	7.0	1093.3	-1.169	-17.13	1061.2		0.157	
991	190	1	18	12.9	1465.3	0.611	-7.17	1424.4		0.494	
992	190	1	19	42.5	830.5	0.984	-23.57	805.3		0.097	
993	190	1	20	29.2	869.2	-1.291	-26.92	842.9		0.085	
994	190	1	21	48.2	416.5	1.062	-43.85	402.9		0.045	
995	190	1	24	18.4	1464.5	0.625	-7.38	1423.6		0.482	
996	190	1	26	13.2	814.5	-1.357	-20.14	789.6		0.111	
997	190	1	27	40.5	595.6	0.687	-31.09	576.8		0.073	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
998	190	1	28	59.1	1470.7	1.154	-5.44	1429.7		0.603	
999	190	1	29	28.2	1024.4	1.066	-32.87	994.1		0.068	
1000	190	1	31	51.5	1037.8	-1.152	-42.87	1007.1		0.046	
1001	190	1	33	28.9	820.4	0.432	-26.95	795.4		0.085	
1002	190	1	34	23.9	660.8	1.519	-47.96	640.2		0.038	
1003	190	1	35	19.9	472.3	1.596	-49.15	457.1		0.036	
1004	190	1	40	6.1	779.3	-1.384	-49.30	755.4		0.036	
1005	190	1	44	20.1	1000.5	1.094	-17.04	970.8		0.159	
1006	190	1	44	41.6	1042.2	0.689	1.07	1011.5		1.276	
1007	190	1	44	58.5	1471.7	1.156	-21.38	1430.7		0.105	
1008	190	1	46	36.4	731.9	1.375	-19.48	709.3		0.120	
1009	190	1	48	35.9	1552.5	-1.437	-35.71	1509.7		0.061	
1010	190	1	49	54.2	924.6	0.964	-27.29	896.9		0.084	
1011	190	1	53	0.7	998.1	1.098	-24.41	968.4		0.094	
1012	190	1	53	18.2	1049.6	0.212	-31.45	1018.7		0.072	
1013	190	1	53	26.6	682.5	0.820	-48.58	661.3		0.037	
1014	190	1	55	32.2	725.0	-1.728	-48.17	702.5		0.038	
1015	190	1	56	25.8	1556.1	1.036	-28.72	1513.2		0.080	
1016	190	1	56	31.8	765.4	-1.322	-38.32	741.9		0.055	
1017	190	1	57	8.8	1870.8	-1.243	-13.46	1821.2		0.240	
1018	190	1	59	59.4	1462.8	1.131	-12.14	1422.0		0.279	
1019	190	2	0	49.7	833.2	-1.379	-4.38	807.9		0.682	
1020	190	2	3	19.9	1017.8	1.178	5.05	987.7		2.019	
1021	190	2	4	36.1	1232.8	-1.590	-30.84	1197.3		0.073	
1022	190	2	6	36.7	1545.9	1.304	-33.85	1503.2		0.065	
1023	190	2	7	1.8	1472.6	1.146	-14.20	1431.6		0.220	
1024	190	2	8	28.8	640.9	0.776	-40.76	620.8		0.050	
1025	190	2	8	38.2	764.4	-0.952	-49.81	740.9		0.035	
1026	190	2	10	20.0	1443.0	0.484	-22.85	1402.6		0.100	
1027	190	2	11	36.1	1538.3	1.162	-7.95	1495.8		0.452	
1028	190	2	11	40.8	1079.6	-1.532	-23.01	1047.9		0.099	
1029	190	2	11	43.6	1547.8	1.346	-30.66	1505.1		0.074	
1030	190	2	13	53.5	867.1	1.188	-36.50	840.9		0.059	
1031	190	2	16	34.4	754.2	-1.584	-3.71	731.0		0.737	
1032	190	2	16	43.6	1066.1	1.045	-42.98	1034.7		0.046	
1033	190	2	18	11.6	813.0	-0.674	-40.70	788.2		0.050	
1034	190	2	19	1.2	797.2	-1.438	-43.38	772.8		0.045	
1035	190	2	20	43.0	1026.3	1.219	-41.07	995.9		0.050	
1036	190	2	25	28.2	892.2	1.038	3.16	865.3		1.624	
1037	190	2	25	33.3	1871.1	1.422	-31.63	1821.5		0.071	
1038	190	2	26	6.3	1056.6	1.195	-12.53	1025.5		0.267	
1039	190	2	26	22.0	665.2	1.325	-40.45	644.5		0.051	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1040	190	2	27	20.2	1481.9	1.077	-36.32	1440.6		0.059	
1041	190	2	27	21.5	696.3	-0.967	-46.17	674.7		0.041	
1042	190	2	27	27.8	1490.6	1.273	-35.41	1449.1		0.062	
1043	190	2	30	54.8	991.8	-1.474	-24.92	962.3		0.092	
1044	190	2	31	20.1	657.3	1.056	-30.45	636.8		0.074	
1045	190	2	34	2.5	1472.4	1.147	-3.57	1431.3		0.748	
1046	190	2	34	28.9	947.5	1.475	-19.77	919.2		0.116	
1047	190	2	35	48.9	1497.4	-1.533	-36.36	1455.7		0.059	
1048	190	2	37	8.0	1553.1	-1.446	-20.86	1510.2		0.108	
1049	190	2	38	6.4	678.3	-1.258	-34.17	657.2		0.065	
1050	190	2	38	17.0	1825.9	0.676	-24.47	1777.2		0.094	
1051	190	2	38	27.7	692.9	-1.074	-31.45	671.4		0.072	
1052	190	2	38	46.8	840.1	-1.110	-41.28	814.6		0.049	
1053	190	2	39	7.3	946.4	-1.422	-19.59	918.1		0.118	
1054	190	2	39	46.9	963.0	-0.794	-45.23	934.2		0.042	
1055	190	2	41	0.3	738.6	0.000	-50.33	715.8		0.035	
1056	190	2	41	35.8	814.5	0.705	-4.04	789.6		0.709	
1057	190	2	43	14.4	784.4	0.704	1.68	760.3		1.369	
1058	190	2	44	55.8	1531.6	1.136	-6.41	1489.3		0.540	
1059	190	2	45	11.2	998.9	0.732	-44.56	969.2		0.043	
1060	190	2	47	22.8	902.8	-1.007	-24.61	875.7		0.093	
1061	190	2	47	45.1	1529.7	1.160	-22.85	1487.3		0.100	
1062	190	2	48	18.4	710.0	-1.045	-0.45	688.0		1.072	
1063	190	2	49	42.0	1370.5	-1.010	-27.23	1331.8		0.084	
1064	190	2	52	32.3	1549.7	1.160	3.25	1506.9		1.640	
1065	190	2	53	19.8	1652.4	-1.522	-29.73	1607.4		0.077	
1066	190	2	53	32.6	747.6	-1.172	-50.10	724.6		0.035	
1067	190	2	54	51.9	1547.4	1.162	-17.97	1504.7		0.143	
1068	190	2	55	54.9	619.8	1.315	-49.44	600.4		0.036	
1069	190	2	55	59.4	1550.0	1.145	-27.73	1507.2		0.083	
1070	190	2	59	22.8	1474.1	-1.355	-10.54	1433.1		0.335	
1071	190	3	0	16.1	720.7	-1.064	-10.40	698.4		0.341	
1072	190	3	3	51.6	1946.7	-0.044	-33.57	1895.6		0.066	
1073	190	3	7	4.3	1456.6	0.801	-8.49	1415.9		0.425	
1074	190	3	7	36.7	1081.0	-1.362	-26.62	1049.3		0.086	
1075	190	3	8	0.8	1812.0	-1.064	-31.89	1763.6		0.070	
1076	190	3	8	14.7	1130.8	-0.277	-11.56	1097.8		0.298	
1077	190	3	9	9.3	1307.3	0.303	-24.17	1270.0		0.095	
1078	190	3	10	16.0	759.1	-1.157	-49.08	735.7		0.036	
1079	190	3	11	22.7	609.7	-0.908	-19.65	590.5		0.118	
1080	190	3	11	31.7	969.5	-0.761	-43.67	940.6		0.045	
1081	190	3	12	3.8	1907.3	-1.281	-18.40	1856.9		0.136	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1082	190	3	14	26.0	770.1	-0.644	-50.18	746.5		0.035	
1083	190	3	14	42.6	961.3	-0.786	-42.42	932.6		0.047	
1084	190	3	15	59.4	1224.2	-1.589	-25.06	1189.0		0.092	
1085	190	3	18	20.6	796.5	0.908	-44.98	772.1		0.043	
1086	190	3	19	21.0	1976.6	-0.791	-31.93	1924.8		0.070	
1087	190	3	21	19.2	1872.2	-1.260	-14.64	1822.6		0.209	
1088	190	3	22	49.7	1756.1	-1.529	-27.85	1708.8		0.082	
1089	190	3	24	5.8	520.2	1.511	-43.96	503.7		0.044	
1090	190	3	25	6.0	748.6	-0.395	-45.98	725.5		0.041	
1091	190	3	27	14.4	1142.9	-1.494	-24.72	1109.7		0.093	
1092	190	3	28	31.0	965.0	-0.256	-14.25	936.2		0.219	
1093	190	3	30	25.0	606.8	-0.767	-45.10	587.7		0.042	
1094	190	3	31	18.2	1445.4	1.203	-26.14	1405.0		0.088	
1095	190	3	33	14.6	1122.7	0.381	-34.91	1089.9		0.063	
1096	190	3	35	27.1	1314.4	0.281	-23.03	1277.0		0.099	
1097	190	3	40	18.5	888.8	1.543	-23.35	862.0		0.098	
1098	190	3	41	12.4	1027.5	0.999	-23.81	997.1		0.096	
1099	190	3	41	58.4	1561.2	-1.529	-30.73	1518.2		0.074	
1100	190	3	42	46.3	874.1	-0.172	-30.63	847.7		0.074	
1101	190	3	42	46.5	1007.1	0.393	-17.19	977.2		0.156	
1102	190	3	43	3.4	857.1	-1.243	-17.32	831.1		0.154	
1103	190	3	46	44.5	716.5	-1.515	-16.77	694.4		0.164	
1104	190	3	48	3.2	796.8	-1.121	-14.69	772.5		0.208	
1105	190	3	48	8.4	878.5	-1.217	-14.04	851.9		0.224	
1106	190	3	49	10.7	1313.9	0.285	-24.61	1276.5		0.093	
1107	190	3	50	18.3	800.5	-1.464	-40.50	776.0		0.051	
1108	190	3	51	7.3	1596.5	-1.411	-34.83	1552.7		0.063	
1109	190	3	51	46.8	1719.0	1.249	-21.18	1672.5		0.106	
1110	190	3	52	50.3	1314.8	0.308	-38.90	1277.4		0.054	
1111	190	3	54	46.8	1308.9	0.298	-28.14	1271.7		0.081	
1112	190	3	57	17.0	1930.2	-1.252	-22.75	1879.3		0.100	
1113	190	3	59	17.9	1307.1	0.267	-25.41	1269.8		0.090	
1114	190	3	59	44.4	743.4	-0.469	-50.78	720.5		0.034	
1115	190	4	0	41.6	851.3	-1.005	-42.70	825.5		0.047	
1116	190	4	0	48.9	1310.7	0.260	-35.76	1273.4		0.061	
1117	190	4	1	15.5	505.2	-0.753	-31.78	489.0		0.071	
1118	190	4	1	46.2	1556.3	-0.901	-19.36	1513.4		0.121	
1119	190	4	3	57.5	1184.6	0.469	-34.50	1150.3		0.064	
1120	190	4	5	2.5	1334.8	0.234	-21.28	1296.9		0.106	
1121	190	4	5	33.7	1303.8	0.254	-21.43	1266.7		0.105	
1122	190	4	6	3.6	1154.4	0.362	-39.59	1120.8		0.052	
1123	190	4	6	29.6	730.6	1.075	-39.69	708.0		0.052	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1124	190	4	6	59.1	1322.1	0.251	-34.70	1284.6		0.063	
1125	190	4	7	9.1	669.7	0.919	-0.01	648.9		1.127	
1126	190	4	8	2.2	1310.9	0.278	-37.67	1273.5		0.056	
1127	190	4	8	20.9	916.9	-1.302	-40.86	889.3		0.050	
1128	190	4	10	25.7	1024.6	0.653	-43.15	994.3		0.046	
1129	190	4	11	24.3	2269.2	-0.987	-28.69	2211.9		0.080	
1130	190	4	12	19.7	1321.4	0.269	-27.76	1283.8		0.083	
1131	190	4	13	35.0	846.6	2.929	-48.24	820.9		0.038	
1132	190	4	14	43.3	1061.4	-1.631	-32.87	1030.1		0.068	
1133	190	4	14	54.8	1313.9	0.256	-32.00	1276.6		0.070	
1134	190	4	15	19.2	996.2	-1.158	-34.74	966.6		0.063	
1135	190	4	16	9.0	1309.7	0.289	-25.58	1272.4		0.090	
1136	190	4	16	58.7	593.1	0.937	-48.37	574.4		0.037	
1137	190	4	17	28.9	1025.1	0.900	-32.30	994.7		0.069	
1138	190	4	17	45.5	794.1	-1.093	-33.65	769.8		0.066	
1139	190	4	17	58.0	648.3	-0.227	-13.92	628.0		0.227	
1140	190	4	19	50.9	1710.7	-1.308	-32.27	1664.5		0.069	
1141	190	4	20	26.7	1053.8	-1.482	-21.08	1022.7		0.107	
1142	190	4	20	30.8	1629.5	0.510	-24.55	1584.9		0.093	
1143	190	4	21	59.3	1484.5	-1.290	-27.17	1443.1		0.084	
1144	190	4	22	6.4	1338.6	-1.253	-23.19	1300.6		0.098	
1145	190	4	24	4.1	1317.0	0.266	-24.81	1279.5		0.092	
1146	190	4	24	4.3	1317.1	0.275	-24.92	1279.6		0.092	
1147	190	4	24	6.2	581.8	0.984	-8.52	563.5		0.423	
1148	190	4	24	48.7	1109.9	-1.010	-40.81	1077.4		0.050	
1149	190	4	26	40.4	808.5	0.765	-20.22	783.8		0.110	
1150	190	4	26	44.7	812.5	1.015	-46.69	787.7		0.040	
1151	190	4	26	48.6	965.6	-1.684	-43.79	936.7		0.045	
1152	190	4	28	36.2	686.5	0.887	-40.45	665.1		0.051	
1153	190	4	28	45.2	933.9	-1.420	-32.91	905.9		0.068	
1154	190	4	28	60.0	798.4	-1.170	-47.96	774.0		0.038	
1155	190	4	29	22.4	789.7	0.247	-47.28	765.5		0.039	
1156	190	4	29	24.6	790.6	0.397	-45.66	766.4		0.042	
1157	190	4	29	25.4	1575.4	-1.464	-17.68	1532.1		0.147	
1158	190	4	29	27.0	1573.1	-1.428	-16.11	1529.8		0.177	
1159	190	4	30	39.0	994.5	0.164	-44.02	964.9		0.044	
1160	190	4	31	9.2	1023.9	-1.079	-13.52	993.6		0.238	
1161	190	4	31	57.7	1310.9	0.278	-39.05	1273.5		0.054	
1162	190	4	33	55.4	1414.1	-1.138	-35.04	1374.3		0.062	
1163	190	4	35	14.7	829.4	-0.983	-22.38	804.1		0.101	
1164	190	4	35	30.3	1376.7	-1.508	-38.52	1337.8		0.055	
1165	190	4	37	4.8	1032.3	0.598	-30.73	1001.8		0.074	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1166	190	4	37	11.9	1039.3	0.937	-31.56	1008.6		0.071	
1167	190	4	37	11.9	1042.9	1.052	-31.56	1012.1		0.071	
1168	190	4	37	19.4	1670.7	0.659	-25.49	1625.3		0.090	
1169	190	4	39	5.5	1045.6	-1.457	-5.65	1014.7		0.589	
1170	190	4	39	37.5	839.3	-1.420	-38.18	813.8		0.055	
1171	190	4	40	20.5	1025.8	-1.174	-31.16	995.4		0.072	
1172	190	4	40	53.6	1034.7	0.810	-41.28	1004.1		0.049	
1173	190	4	41	13.2	1517.9	-1.420	-37.86	1475.8		0.056	
1174	190	4	41	21.8	1258.9	1.291	-34.87	1222.8		0.063	
1175	190	4	43	21.3	931.1	-2.206	-46.36	903.2		0.040	
1176	190	4	45	9.4	1443.8	-1.471	-19.31	1403.4		0.122	
1177	190	4	45	14.5	816.8	0.728	-17.87	791.9		0.144	
1178	190	4	45	29.6	671.1	0.732	-48.58	650.2		0.037	
1179	190	4	45	56.9	763.2	-1.316	-25.15	739.8		0.091	
1180	190	4	47	12.5	1521.6	-1.084	-35.63	1479.5		0.061	
1181	190	4	47	29.6	904.2	-0.959	-45.48	877.0		0.042	
1182	190	4	49	60.0	751.7	2.211	-50.48	728.5		0.035	
1183	190	4	50	53.2	640.4	2.226	-49.15	620.4		0.036	
1184	190	4	51	4.5	1473.2	-1.542	-11.44	1432.2		0.302	
1185	190	4	52	33.3	1123.2	1.223	-25.64	1090.4		0.090	
1186	190	4	53	53.7	785.7	-1.285	-46.95	761.7		0.040	
1187	190	4	54	24.6	805.3	0.644	-46.49	780.7		0.040	
1188	190	4	55	14.4	1661.6	0.291	-28.14	1616.4		0.081	
1189	190	4	55	40.3	1601.2	-1.600	-12.59	1557.3		0.265	
1190	190	4	56	41.3	1017.6	1.194	5.75	987.4		2.186	
1191	190	4	57	2.9	1462.1	1.137	-3.61	1421.2		0.745	
1192	190	4	57	22.3	848.2	-0.957	-47.02	822.4		0.039	
1193	190	4	58	18.4	1117.6	-1.197	-41.93	1084.9		0.048	
1194	190	4	58	49.9	1747.7	-1.163	-31.02	1700.7		0.073	
1195	190	5	0	22.5	1510.2	-1.260	-32.99	1468.3		0.068	
1196	190	5	1	48.1	1538.6	-0.873	-27.17	1496.1		0.084	
1197	190	5	3	25.1	1132.4	-1.502	-22.00	1099.4		0.103	
1198	190	5	3	52.1	668.4	-1.051	-30.35	647.6		0.075	
1199	190	5	4	44.8	995.1	-1.158	-35.88	965.5		0.060	
1200	190	5	5	18.1	1476.6	-1.341	-35.20	1435.5		0.062	
1201	190	5	12	14.0	675.1	1.063	-26.65	654.1		0.086	
1202	190	5	13	40.8	1125.7	-1.190	-23.25	1092.9		0.098	
1203	190	5	16	57.4	2189.2	0.441	-24.44	2133.3		0.094	
1204	190	5	17	21.8	1048.1	-1.112	-31.89	1017.2		0.070	
1205	190	5	17	28.8	1041.5	-0.803	-33.22	1010.8		0.067	
1206	190	5	17	42.3	1672.8	-1.393	-17.01	1627.3		0.159	
1207	190	5	18	43.9	1083.2	-1.513	-34.46	1051.4		0.064	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1208	190	5	19	48.6	2056.5	-1.274	-28.08	2003.1		0.082	
1209	190	5	20	35.3	1925.8	-1.009	-29.56	1875.1		0.077	
1210	190	5	22	43.6	1604.7	-1.300	-23.89	1560.7		0.096	
1211	190	5	23	21.2	916.9	0.780	-40.97	889.4		0.050	
1212	190	5	25	35.5	1806.5	-1.300	-15.37	1758.2		0.192	
1213	190	5	26	2.3	1004.3	-0.757	-40.76	974.5		0.050	
1214	190	5	27	0.6	1142.8	-1.226	-27.23	1109.5		0.084	
1215	190	5	28	13.5	869.3	-1.555	-30.66	843.0		0.074	
1216	190	5	28	59.7	981.1	1.184	-26.47	951.9		0.087	
1217	190	5	30	38.8	1883.5	0.462	-19.49	1833.6		0.120	
1218	190	5	31	15.4	1895.3	1.573	-28.72	1845.2		0.080	
1219	190	5	33	20.3	594.2	-1.447	-7.90	575.4		0.455	
1220	190	5	36	1.6	829.4	-1.022	-22.36	804.1		0.102	
1221	190	5	36	31.5	1029.0	-1.129	-12.03	998.6		0.283	
1222	190	5	37	30.6	766.9	0.915	-35.50	743.3		0.061	
1223	190	5	40	51.9	1346.7	-1.613	-38.47	1308.5		0.055	
1224	190	5	41	6.1	1028.0	1.173	2.32	997.6		1.474	
1225	190	5	41	20.8	966.5	0.299	-23.25	937.7		0.098	
1226	190	5	44	20.1	563.7	1.464	-35.46	545.8		0.061	
1227	190	5	44	38.5	984.7	0.658	-32.23	955.4		0.070	
1228	190	5	46	2.2	518.1	1.269	-48.30	501.6		0.038	
1229	190	5	47	13.3	1125.2	-1.169	-32.87	1092.3		0.068	
1230	190	5	47	35.8	1394.1	-1.313	-31.23	1354.8		0.072	
1231	190	5	47	43.8	949.8	1.226	-43.15	921.3		0.046	
1232	190	5	47	48.7	988.4	1.215	-42.26	959.0		0.047	
1233	190	5	48	51.1	673.1	1.241	-24.08	652.1		0.095	
1234	190	5	50	43.9	467.5	1.233	-28.01	452.4		0.082	
1235	190	5	50	50.7	1038.8	-0.015	-44.62	1008.1		0.043	
1236	190	5	51	5.6	581.4	1.194	-31.38	563.1		0.072	
1237	190	5	51	21.9	1058.7	1.316	-23.97	1027.6		0.095	
1238	190	5	51	29.0	1088.9	-1.501	-23.86	1056.9		0.096	
1239	190	5	51	38.6	484.8	1.242	-40.60	469.2		0.050	
1240	190	5	51	55.9	519.9	1.274	-33.38	503.3		0.067	
1241	190	5	52	43.5	1566.1	0.506	-31.74	1522.9		0.071	
1242	190	5	53	32.2	497.0	1.217	-26.98	481.1		0.085	
1243	190	5	53	43.6	981.7	0.754	-38.95	952.4		0.054	
1244	190	5	53	53.6	629.8	1.233	-44.38	610.0		0.044	
1245	190	5	54	18.8	886.3	-1.069	-35.97	859.6		0.060	
1246	190	5	55	4.0	1020.5	0.555	-41.71	990.3		0.048	
1247	190	5	55	15.1	1533.4	-1.342	-21.30	1490.9		0.106	
1248	190	5	56	2.7	987.4	0.791	-44.62	958.0		0.043	
1249	190	5	56	34.5	988.3	0.794	-38.28	958.9		0.055	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1250	190	5	56	40.5	1016.8	0.588	-35.93	986.7		0.060	
1251	190	5	57	53.9	619.2	1.125	-43.67	599.8		0.045	
1252	190	5	58	19.9	489.8	1.193	-32.27	474.1		0.069	
1253	190	5	59	54.6	708.6	0.791	-48.73	686.6		0.037	
1254	190	6	1	54.0	876.9	1.032	-45.48	850.4		0.042	
1255	190	6	2	7.1	1167.4	-0.242	-36.58	1133.6		0.059	
1256	190	6	3	6.5	876.8	-1.164	-27.95	850.3		0.082	
1257	190	6	3	38.6	998.1	1.193	-41.55	968.4		0.049	
1258	190	6	4	16.4	998.3	1.180	2.11	968.6		1.439	
1259	190	6	5	30.8	1138.3	-1.268	-23.54	1105.1		0.097	
1260	190	6	5	42.2	635.7	-1.445	-36.90	615.8		0.058	
1261	190	6	7	21.1	1446.4	1.135	-6.92	1406.0		0.509	
1262	190	6	8	13.6	713.1	-0.987	-44.74	691.0		0.043	
1263	190	6	8	44.3	741.3	-1.268	-48.73	718.5		0.037	
1264	190	6	9	53.2	934.9	-0.864	-43.61	906.9		0.045	
1265	190	6	10	9.9	892.4	-1.034	-26.83	865.5		0.086	
1266	190	6	10	53.2	1440.9	-1.305	-34.01	1400.5		0.065	
1267	190	6	11	14.3	960.1	0.571	-45.41	931.4		0.042	
1268	190	6	11	37.1	674.7	-1.588	-26.02	653.7		0.088	
1269	190	6	11	41.5	1132.6	-1.445	-37.53	1099.5		0.057	
1270	190	6	12	11.9	369.9	0.142	-51.01	357.7		0.034	
1271	190	6	13	16.7	510.4	0.971	-51.01	494.0		0.034	
1272	190	6	15	1.2	887.9	-0.903	-43.55	861.1		0.045	
1273	190	6	17	9.4	861.0	-1.345	-19.12	834.9		0.125	
1274	190	6	17	40.5	1166.6	-1.267	-38.00	1132.7		0.056	
1275	190	6	19	31.3	1229.8	0.773	-15.07	1194.4		0.199	
1276	190	6	20	4.5	786.7	1.409	-36.50	762.6		0.059	
1277	190	6	22	17.8	1460.9	-1.438	-30.21	1420.1		0.075	
1278	190	6	23	37.0	716.2	-1.349	-21.80	694.0		0.104	
1279	190	6	24	14.9	717.1	-1.110	-28.59	694.9		0.080	
1280	190	6	24	41.4	908.0	-1.550	-26.26	880.7		0.087	
1281	190	6	24	50.1	1346.6	-0.559	-28.01	1308.4		0.082	
1282	190	6	24	54.8	844.3	1.153	-23.30	818.7		0.098	
1283	190	6	25	39.2	1678.6	-1.492	-14.91	1633.0		0.203	
1284	190	6	26	48.6	575.3	0.128	-50.03	557.1		0.035	
1285	190	6	27	25.3	603.2	1.999	-49.30	584.2		0.036	
1286	190	6	27	48.3	667.3	3.588	-48.17	646.5		0.038	
1287	190	6	27	57.0	2086.8	-1.422	-26.17	2032.9		0.088	
1288	190	6	28	12.7	460.7	1.446	-6.15	445.9		0.556	
1289	190	6	30	3.5	951.6	-0.982	-23.14	923.2		0.099	
1290	190	6	31	5.5	1133.1	-1.183	-34.05	1100.1		0.065	
1291	190	6	32	33.8	902.5	-1.347	-43.44	875.3		0.045	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1292	190	6	32	34.8	1444.1	-1.447	-27.01	1403.7		0.085	
1293	190	6	32	40.0	896.1	-1.010	-42.37	869.1		0.047	
1294	190	6	35	7.9	977.3	0.315	-44.02	948.2		0.044	
1295	190	6	35	26.7	912.2	-1.193	-46.24	884.8		0.041	
1296	190	6	36	34.1	488.9	0.556	-49.22	473.2		0.036	
1297	190	6	38	40.2	756.9	-1.551	-40.76	733.6		0.050	
1298	190	6	40	50.3	1566.5	-1.491	-22.88	1523.3		0.100	
1299	190	6	40	53.2	831.5	-1.032	-34.34	806.2		0.064	
1300	190	6	41	12.9	579.8	1.442	-41.33	561.4		0.049	
1301	190	6	41	25.4	835.2	-1.102	-28.76	809.8		0.079	
1302	190	6	42	39.9	641.1	0.937	-1.48	621.0		0.952	
1303	190	6	42	59.4	1527.9	-1.697	-28.69	1485.6		0.080	
1304	190	6	43	39.9	1528.9	-1.419	-21.48	1486.5		0.105	
1305	190	6	45	57.9	393.2	-1.367	-32.72	380.4		0.068	
1306	190	6	47	37.6	679.1	-0.037	-44.44	658.0		0.044	
1307	190	6	48	9.4	1494.9	1.104	-29.42	1453.4		0.077	
1308	190	6	48	54.9	821.6	0.817	-35.46	796.6		0.061	
1309	190	6	49	7.0	1545.7	-1.210	-26.68	1503.0		0.086	
1310	190	6	49	40.9	1497.5	-1.141	-36.32	1455.8		0.059	
1311	190	6	50	50.8	854.0	-1.113	-13.32	828.1		0.244	
1312	190	6	51	21.0	886.6	-0.381	-45.85	859.9		0.041	
1313	190	6	52	23.4	1718.7	-1.705	-33.53	1672.2		0.066	
1314	190	6	52	42.3	572.3	1.049	-24.67	554.2		0.093	
1315	190	6	55	50.6	578.5	1.103	-48.80	560.2		0.037	
1316	190	6	56	26.2	1457.1	1.143	-3.91	1416.4		0.719	
1317	190	6	56	46.8	864.2	-1.134	-6.82	838.0		0.515	
1318	190	6	58	1.3	952.8	0.726	-17.82	924.3		0.145	
1319	190	6	58	6.0	956.3	0.959	-42.15	927.7		0.048	
1320	190	6	58	10.6	814.1	1.084	-47.28	789.2		0.039	
1321	190	6	58	32.9	1532.5	-1.485	-13.92	1490.1		0.227	
1322	190	7	0	10.0	1463.3	-1.253	-26.05	1422.5		0.088	
1323	190	7	0	45.5	1366.0	-1.425	-35.80	1327.4		0.061	
1324	190	7	1	0.5	1062.9	-1.245	-36.85	1031.6		0.058	
1325	190	7	2	21.4	1199.0	-1.543	-16.29	1164.4		0.173	
1326	190	7	2	49.6	1519.5	-1.348	2.97	1477.4		1.588	
1327	190	7	4	17.0	1002.2	0.706	1.44	972.4		1.332	
1328	190	7	4	40.3	1512.2	1.236	-28.30	1470.2		0.081	
1329	190	7	6	34.2	671.1	1.254	3.41	650.2		1.670	
1330	190	7	6	56.7	1123.6	-1.559	-29.52	1090.8		0.077	
1331	190	7	8	0.3	1143.3	-1.425	-19.24	1110.0		0.123	
1332	190	7	8	1.8	636.3	-1.021	2.45	616.4		1.495	
1333	190	7	8	6.9	1512.1	-1.411	-29.05	1470.1		0.079	
1334	190	7	8	8.3	632.1	-0.469	-49.15	612.3		0.036	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1335	190	7	8	9.6	1508.4	-1.335	-29.66	1466.5		0.077	
1336	190	7	8	30.9	1574.1	-1.359	-18.42	1530.8		0.135	
1337	190	7	10	3.0	752.3	0.701	-33.18	729.2		0.067	
1338	190	7	14	30.3	1402.0	-1.600	-19.85	1362.6		0.115	
1339	190	7	14	40.7	907.0	-0.963	-41.33	879.7		0.049	
1340	190	7	16	58.8	1054.6	1.145	9.45	1023.5		3.349	
1341	190	7	17	3.6	1060.6	1.345	-21.90	1029.4		0.103	
1342	190	7	17	4.1	1410.1	-1.568	-24.28	1370.4		0.094	
1343	190	7	17	31.8	826.1	-1.444	-6.54	800.9		0.532	
1344	190	7	17	45.3	853.3	-1.129	-44.26	827.5		0.044	
1345	190	7	18	6.2	1465.0	1.291	-29.83	1424.2		0.076	
1346	190	7	18	16.8	940.7	-1.054	-25.99	912.5		0.088	
1347	190	7	18	20.2	625.9	-1.211	-28.86	606.3		0.079	
1348	190	7	18	33.1	962.9	0.113	-19.91	934.1		0.114	
1349	190	7	19	4.5	920.3	-1.146	-38.23	892.7		0.055	
1350	190	7	19	50.4	1497.0	1.137	-2.99	1455.4		0.800	
1351	190	7	19	57.7	1893.2	-1.660	-19.80	1843.2		0.116	
1352	190	7	19	58.4	1892.1	-1.646	-20.06	1842.0		0.112	
1353	190	7	19	59.0	742.6	-0.891	-41.33	719.7		0.049	
1354	190	7	20	24.9	803.2	-1.182	-39.39	778.6		0.053	
1355	190	7	20	46.2	1085.4	-1.519	-37.44	1053.6		0.057	
1356	190	7	20	50.6	757.9	-1.098	-14.92	734.6		0.202	
1357	190	7	21	8.2	870.3	-1.085	-38.42	844.0		0.055	
1358	190	7	21	57.6	878.2	-1.119	1.15	851.6		1.288	
1359	190	7	22	22.8	831.5	-1.448	-7.80	806.2		0.460	
1360	190	7	22	41.7	848.6	-1.437	-43.67	822.8		0.045	
1361	190	7	23	20.0	836.0	0.849	-48.24	810.6		0.038	
1362	190	7	23	29.8	1450.7	1.030	-33.03	1410.1		0.067	
1363	190	7	24	6.1	1536.0	-1.439	-30.56	1493.6		0.074	
1364	190	7	25	2.6	1650.6	-1.445	-31.67	1605.6		0.071	
1365	190	7	25	24.9	862.5	-1.056	-23.30	836.3		0.098	
1366	190	7	27	57.3	1109.8	0.508	-39.00	1077.3		0.054	
1367	190	7	29	12.8	862.4	-1.094	-11.43	836.3		0.303	
1368	190	7	30	46.7	1553.7	-1.400	-22.72	1510.9		0.100	
1369	190	7	30	49.3	993.3	1.255	-39.89	963.8		0.052	
1370	190	7	31	21.5	728.0	-1.016	-48.24	705.6		0.038	
1371	190	7	32	6.6	1015.0	-0.765	-36.90	984.9		0.058	
1372	190	7	32	19.0	1599.0	-1.721	-35.80	1555.1		0.061	
1373	190	7	34	37.7	819.2	-1.098	-48.03	794.2		0.038	
1374	190	7	35	56.9	1459.5	1.291	-27.35	1418.7		0.084	
1375	190	7	36	4.2	663.6	1.485	-46.89	642.9		0.040	
1376	190	7	36	25.6	1463.6	-1.638	-19.60	1422.7		0.118	
1377	190	7	36	50.8	1022.1	-1.155	-27.57	991.8		0.083	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1378	190	7	37	4.7	1380.9	-1.461	-23.27	1341.9		0.098	
1379	190	7	37	6.9	866.8	-1.047	-32.12	840.6		0.070	
1380	190	7	38	42.8	782.0	1.111	-36.06	758.1		0.060	
1381	190	7	39	16.5	663.7	-1.267	-29.52	643.0		0.077	
1382	190	7	39	50.5	1057.9	-0.976	-30.07	1026.8		0.076	
1383	190	7	39	52.1	788.7	-1.590	-12.03	764.6		0.283	
1384	190	7	40	38.9	790.8	-1.603	-24.39	766.6		0.094	
1385	190	7	40	44.8	868.7	-1.087	-31.27	842.4		0.072	
1386	190	7	42	20.5	1466.8	1.157	-6.79	1425.9		0.516	
1387	190	7	43	40.0	868.7	-1.095	-44.26	842.4		0.044	
1388	190	7	43	51.6	781.7	-0.962	-39.54	757.8		0.053	
1389	190	7	44	9.9	1037.2	0.837	-25.03	1006.5		0.092	
1390	190	7	45	3.7	957.3	1.223	-44.14	928.7		0.044	
1391	190	7	45	19.7	915.8	0.759	-19.26	888.3		0.123	
1392	190	7	45	47.9	1388.5	-1.215	-38.66	1349.4		0.054	
1393	190	7	45	53.8	1559.2	-1.649	-32.08	1516.2		0.070	
1394	190	7	46	27.6	1499.9	-1.557	-36.54	1458.2		0.059	
1395	190	7	46	38.1	1469.5	1.139	-2.32	1428.5		0.864	
1396	190	7	48	25.3	1528.5	-1.564	-12.82	1486.2		0.258	
1397	190	7	48	51.5	957.6	-1.569	-32.87	928.9		0.068	
1398	190	7	49	4.2	872.1	-1.086	-30.28	845.7		0.075	
1399	190	7	50	5.3	613.2	1.335	-22.28	593.9		0.102	
1400	190	7	50	55.1	863.2	-1.080	-31.60	837.0		0.071	
1401	190	7	52	54.3	813.5	-1.074	-48.10	788.6		0.038	
1402	190	7	53	40.8	1474.7	1.182	-16.57	1433.6		0.167	
1403	190	7	53	51.9	579.8	-1.058	-33.97	561.5		0.065	
1404	190	7	54	7.5	1470.7	1.155	-12.63	1429.7		0.264	
1405	190	7	55	35.2	787.6	-1.637	-43.90	763.5		0.044	
1406	190	7	55	55.3	1669.4	-0.949	-21.80	1624.0		0.104	
1407	190	7	56	29.5	1767.2	-1.311	-17.25	1719.7		0.155	
1408	190	7	56	54.5	863.9	-1.001	-30.21	837.8		0.075	
1409	190	7	57	56.5	825.8	-1.295	-35.41	800.6		0.062	
1410	190	7	58	11.7	1026.3	0.820	-44.02	995.9		0.044	
1411	190	7	58	26.6	659.8	1.256	-0.36	639.2		1.083	
1412	190	8	1	1.1	913.0	-1.144	-19.84	885.6		0.115	
1413	190	8	2	53.9	742.7	2.065	-50.55	719.8		0.034	
1414	190	8	4	38.5	997.7	1.180	-42.64	968.0		0.047	
1415	190	8	5	39.2	1163.1	-1.465	-13.44	1129.4		0.240	
1416	190	8	10	15.7	1473.3	-1.353	-34.21	1432.2		0.064	
1417	190	8	10	47.1	1466.0	-1.595	-30.42	1425.1		0.075	
1418	190	8	10	51.3	2241.8	-0.469	-22.67	2185.0		0.100	
1419	190	8	10	53.8	1457.7	-1.404	2.76	1417.0		1.551	
1420	190	8	14	21.6	1097.0	-1.533	-21.23	1064.9		0.106	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1421	190	8	15	23.4	956.1	-1.159	-27.89	927.5		0.082	
1422	190	8	17	10.9	1522.9	-1.528	-24.61	1480.8		0.093	
1423	190	8	17	34.2	1068.2	-1.103	-13.69	1036.8		0.233	
1424	190	8	17	41.6	747.2	-1.403	-48.51	724.2		0.037	
1425	190	8	17	47.7	1720.9	0.314	-31.89	1674.4		0.070	
1426	190	8	19	28.5	1548.5	-1.482	-33.53	1505.7		0.066	
1427	190	8	20	22.9	1240.2	1.071	-35.63	1204.5		0.061	
1428	190	8	20	42.8	1593.0	-1.445	-32.23	1549.3		0.070	
1429	190	8	21	2.9	1430.7	-1.697	-13.88	1390.6		0.228	
1430	190	8	21	11.4	1562.0	-1.490	-3.65	1519.0		0.741	
1431	190	8	22	11.0	907.5	-1.218	-39.44	880.2		0.053	
1432	190	8	23	12.3	600.0	0.953	-30.70	581.1		0.074	
1433	190	8	25	3.9	1447.6	-1.568	-24.47	1407.1		0.094	
1434	190	8	28	15.4	656.3	-1.015	-42.09	635.8		0.048	
1435	190	8	28	41.3	1465.6	1.125	-5.32	1424.7		0.612	
1436	190	8	29	48.5	2377.7	-3.515	-27.01	2318.3		0.085	
1437	190	8	30	49.8	1751.7	-1.512	-17.36	1704.6		0.153	
1438	190	8	31	17.2	841.0	-1.107	-41.98	815.4		0.048	
1439	190	8	36	45.8	1576.3	-1.185	-35.41	1532.9		0.062	
1440	190	8	38	2.9	1016.6	1.318	-44.92	986.4		0.043	
1441	190	8	39	25.9	1470.6	1.121	-32.91	1429.6		0.068	
1442	190	8	39	52.6	1019.5	1.219	-15.28	989.3		0.194	
1443	190	8	41	6.3	1533.0	-1.528	-1.32	1490.6		0.970	
1444	190	8	42	30.8	1266.8	-1.275	-35.12	1230.5		0.062	
1445	190	8	43	50.5	1547.4	-1.407	-35.97	1504.7		0.060	
1446	190	8	44	39.2	724.5	-1.758	-17.80	702.1		0.145	
1447	190	8	44	55.7	1280.4	-1.447	-34.62	1243.8		0.063	
1448	190	8	46	44.2	1934.5	-1.823	-32.38	1883.6		0.069	
1449	190	8	49	13.4	1364.2	-1.485	-27.95	1325.6		0.082	
1450	190	8	49	47.5	1040.9	1.155	-36.94	1010.2		0.058	
1451	190	8	50	32.5	1051.8	0.720	-6.26	1020.8		0.549	
1452	190	8	50	45.2	1431.0	0.711	-30.91	1390.9		0.073	
1453	190	8	50	45.3	1431.0	0.719	-31.52	1390.9		0.071	
1454	190	8	50	48.0	706.3	-0.907	-10.33	684.4		0.344	
1455	190	8	51	19.1	1455.5	-1.575	-30.59	1414.8		0.074	
1456	190	8	51	54.3	1534.7	-1.492	-15.40	1492.3		0.192	
1457	190	8	52	4.6	907.3	1.420	-32.19	880.0		0.070	
1458	190	8	53	18.5	1064.2	-1.091	8.97	1032.9		3.171	
1459	190	8	53	29.8	745.3	-0.668	-47.75	722.4		0.038	
1460	190	8	55	52.7	1516.1	-1.515	-5.58	1474.0		0.594	
1461	190	8	56	0.0	1505.7	-1.319	-25.96	1463.9		0.088	
1462	190	8	58	27.0	1108.4	-1.252	-33.93	1076.0		0.065	
1463	190	8	58	45.9	1037.3	1.131	-17.38	1006.7		0.153	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1464	190	8	58	54.3	1389.9	-1.131	-15.24	1350.7		0.195	
1465	190	8	59	2.0	1411.7	-1.649	-35.08	1372.0		0.062	
1466	190	8	59	46.8	929.0	-0.744	-39.39	901.1		0.053	
1467	190	9	1	23.8	843.1	-1.246	-29.69	817.5		0.077	
1468	190	9	2	3.8	369.1	1.080	-12.61	357.1		0.264	
1469	190	9	2	44.6	914.9	1.319	-16.73	887.4		0.164	
1470	190	9	2	48.4	920.4	1.509	-28.01	892.7		0.082	
1471	190	9	2	48.7	1553.3	-1.556	-27.38	1510.5		0.084	
1472	190	9	2	49.3	1552.4	-1.541	-27.54	1509.5		0.083	
1473	190	9	3	8.7	1519.3	-1.330	-36.76	1477.2		0.058	
1474	190	9	3	24.0	1042.7	0.719	-36.90	1011.9		0.058	
1475	190	9	5	2.6	767.8	0.688	-44.62	744.2		0.043	
1476	190	9	5	17.8	640.5	-0.858	-47.02	620.5		0.039	
1477	190	9	6	38.1	607.8	-1.237	-45.04	588.7		0.043	
1478	190	9	7	32.5	689.5	-0.205	-37.35	668.1		0.057	
1479	190	9	9	4.9	1895.3	-0.942	-24.33	1845.2		0.094	
1480	190	9	9	24.0	990.6	1.232	-12.15	961.1		0.279	
1481	190	9	9	34.5	794.5	-1.630	-45.41	770.2		0.042	
1482	190	9	10	22.4	631.8	0.220	-48.87	612.0		0.037	
1483	190	9	11	13.9	867.5	-0.952	-47.02	841.2		0.039	
1484	190	9	12	37.1	941.4	0.465	-34.91	913.2		0.063	
1485	190	9	13	33.9	946.1	-1.145	8.77	917.8		3.098	
1486	190	9	15	26.5	1082.0	0.057	-40.65	1050.3		0.050	
1487	190	9	15	55.8	958.0	2.161	-40.76	929.3		0.050	
1488	190	9	16	12.2	697.5	-1.289	-49.59	675.9		0.036	
1489	190	9	18	14.2	1098.0	-1.523	-42.53	1065.8		0.047	
1490	190	9	18	56.1	1057.2	-1.245	-34.42	1026.1		0.064	
1491	190	9	21	35.3	853.3	-1.138	-30.28	827.5		0.075	
1492	190	9	21	46.0	995.7	-1.507	-19.99	966.1		0.113	
1493	190	9	21	48.8	1254.7	-1.520	-27.01	1218.7		0.085	
1494	190	9	22	35.9	537.7	1.140	-17.12	520.6		0.157	
1495	190	9	24	43.6	628.7	-0.747	-49.15	608.9		0.036	
1496	190	9	24	54.5	1001.5	0.734	2.91	971.8		1.577	
1497	190	9	25	52.3	848.4	-1.822	-45.73	822.6		0.041	
1498	190	9	26	6.3	1070.9	1.093	-27.95	1039.4		0.082	
1499	190	9	26	15.6	979.1	0.894	-41.55	949.9		0.049	
1500	190	9	26	43.6	1454.8	0.990	-18.10	1414.2		0.141	
1501	190	9	27	14.9	745.0	-1.094	-34.70	722.1		0.063	
1502	190	9	28	19.4	867.4	-1.046	-39.54	841.1		0.053	
1503	190	9	28	47.7	1118.4	-1.494	-26.71	1085.7		0.086	
1504	190	9	29	27.6	1153.1	0.262	-14.42	1119.5		0.215	
1505	190	9	29	59.2	1420.4	-1.617	-30.04	1380.5		0.076	
1506	190	9	31	48.0	898.1	-1.087	-30.80	871.1		0.073	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1507	190	9	32	45.2	977.8	1.213	5.09	948.7		2.027	
1508	190	9	32	56.9	953.4	-1.215	-46.04	924.9		0.041	
1509	190	9	33	15.3	1139.4	-1.597	-19.24	1106.2		0.123	
1510	190	9	35	2.1	569.0	0.849	-36.28	551.0		0.060	
1511	190	9	36	5.9	1429.5	-1.084	-21.33	1389.4		0.106	
1512	190	9	36	53.1	603.1	-1.383	12.42	584.1		4.713	
1513	190	9	37	36.8	758.0	-1.128	-34.58	734.7		0.064	
1514	190	9	38	3.9	703.1	-1.318	-49.88	681.3		0.035	
1515	190	9	40	10.1	987.5	0.975	-43.21	958.1		0.046	
1516	190	9	40	21.0	1061.2	-0.913	-19.73	1029.9		0.116	
1517	190	9	40	51.8	1027.7	-0.981	-35.97	997.3		0.060	
1518	190	9	44	29.0	856.5	-1.092	-21.45	830.6		0.105	
1519	190	9	44	46.6	1116.8	-1.521	-19.60	1084.1		0.118	
1520	190	9	46	7.0	673.2	1.219	-6.87	652.3		0.512	
1521	190	9	46	8.9	869.3	0.800	-14.89	843.0		0.203	
1522	190	9	46	22.6	1038.0	0.531	-18.37	1007.3		0.136	
1523	190	9	47	9.2	996.0	1.244	-11.36	966.4		0.305	
1524	190	9	47	17.6	811.5	-1.034	-42.64	786.7		0.047	
1525	190	9	47	24.5	1043.4	0.597	-41.28	1012.6		0.049	
1526	190	9	47	35.8	801.2	-1.114	-30.07	776.7		0.076	
1527	190	9	47	50.4	978.7	-1.054	-25.06	949.5		0.092	
1528	190	9	48	17.2	742.5	0.864	-50.55	719.6		0.034	
1529	190	9	49	45.4	600.5	-0.779	-42.70	581.5		0.047	
1530	190	9	50	41.4	885.7	-1.125	-19.57	858.9		0.119	
1531	190	9	51	21.0	666.8	1.395	-30.73	646.0		0.074	
1532	190	9	52	8.6	887.1	-1.582	-44.08	860.3		0.044	
1533	190	9	52	13.6	1494.7	-1.654	-15.58	1453.1		0.188	
1534	190	9	52	16.8	875.0	0.824	-28.69	848.5		0.080	
1535	190	9	52	21.5	1482.5	-1.437	8.39	1441.2		2.964	
1536	190	9	52	53.2	586.7	0.922	-49.44	568.2		0.036	
1537	190	9	53	0.6	995.2	0.747	-44.20	965.6		0.044	
1538	190	9	53	37.4	983.6	0.387	-42.87	954.3		0.046	
1539	190	9	54	49.4	1081.6	-0.341	-25.18	1049.9		0.091	
1540	190	9	55	14.9	2234.0	-1.278	-21.88	2177.3		0.103	
1541	190	9	55	18.6	899.4	-1.062	-42.98	872.3		0.046	
1542	190	9	55	37.9	1040.7	0.578	-17.63	1010.0		0.148	
1543	190	9	56	4.5	866.0	0.712	-36.28	839.8		0.060	
1544	190	9	56	56.8	2372.9	-0.777	-21.45	2313.6		0.105	
1545	190	9	57	9.3	1477.1	-1.238	-30.59	1435.9		0.074	
1546	190	9	57	26.4	1026.3	0.754	-39.59	996.0		0.052	
1547	190	9	57	39.9	1522.1	-1.482	-23.92	1479.9		0.096	
1548	190	9	59	25.6	1406.7	-1.557	-23.30	1367.1		0.098	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1549	190	9	59	48.0	652.0	0.281	-39.64	631.6		0.052	
1550	190	10	2	25.9	1472.1	-1.503	-32.42	1431.1		0.069	
1551	190	10	2	57.0	1461.6	-1.518	-2.90	1420.8		0.808	
1552	190	10	3	5.9	840.9	1.084	-47.48	815.3		0.039	
1553	190	10	4	4.4	812.6	-1.121	-36.14	787.8		0.060	
1554	190	10	4	10.2	1027.9	0.637	-42.98	997.5		0.046	
1555	190	10	4	14.5	804.5	-0.509	-44.44	779.9		0.044	
1556	190	10	4	27.5	536.2	-2.446	-48.51	519.1		0.037	
1557	190	10	4	42.2	510.5	-0.986	-27.04	494.2		0.085	
1558	190	10	4	49.9	1019.3	1.072	-39.29	989.1		0.053	
1559	190	10	5	48.9	1574.1	-1.114	-28.56	1530.8		0.080	
1560	190	10	6	7.7	1648.6	-1.299	-28.82	1603.7		0.079	
1561	190	10	7	21.1	783.2	0.224	-41.50	759.2		0.049	
1562	190	10	7	41.0	832.1	0.982	-12.08	806.8		0.281	
1563	190	10	8	26.7	640.0	-0.903	-41.18	620.0		0.049	
1564	190	10	10	27.9	1160.1	0.420	-36.14	1126.4		0.060	
1565	190	10	11	52.6	1119.5	-1.646	-15.46	1086.8		0.190	
1566	190	10	12	32.4	705.5	-1.169	-42.81	683.6		0.046	
1567	190	10	13	11.9	837.8	-1.325	-47.69	812.3		0.038	
1568	190	10	13	24.1	1828.6	-1.447	-14.54	1779.8		0.212	
1569	190	10	13	33.9	801.2	-1.028	-23.73	776.7		0.096	
1570	190	10	14	29.5	979.4	1.080	-41.76	950.3		0.048	
1571	190	10	14	34.2	1583.1	-1.816	-36.99	1539.6		0.058	
1572	190	10	15	12.6	1514.2	-1.558	-28.69	1472.2		0.080	
1573	190	10	15	43.5	845.6	0.234	-42.76	819.9		0.046	
1574	190	10	16	32.6	1581.8	-1.378	-35.08	1538.4		0.062	
1575	190	10	17	22.8	924.9	1.307	-11.41	897.2		0.303	
1576	190	10	17	56.6	640.2	0.923	-49.66	620.2		0.036	
1577	190	10	20	2.3	1604.5	-1.300	-29.90	1560.6		0.076	
1578	190	10	20	10.5	1746.2	-1.062	-16.78	1699.2		0.164	
1579	190	10	20	27.0	1486.4	1.353	-5.56	1445.0		0.595	
1580	190	10	21	56.6	945.4	-1.096	-35.97	917.1		0.060	
1581	190	10	23	50.7	1069.4	-1.250	-31.49	1038.0		0.072	
1582	190	10	24	34.0	975.6	0.830	-29.59	946.5		0.077	
1583	190	10	24	46.2	1599.2	-1.620	-21.72	1555.3		0.104	
1584	190	10	25	5.3	1640.3	-1.443	-21.80	1595.6		0.104	
1585	190	10	25	24.9	1264.4	-1.488	-39.00	1228.2		0.054	
1586	190	10	25	55.2	910.0	0.264	-41.98	882.6		0.048	
1587	190	10	26	14.9	778.9	0.117	-47.42	755.0		0.039	
1588	190	10	27	3.6	704.4	-2.394	-46.69	682.6		0.040	
1589	190	10	27	12.8	1009.1	0.752	-41.02	979.1		0.050	
1590	190	10	27	23.1	671.9	-0.992	4.40	650.9		1.872	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1591	190	10	29	32.0	1004.2	-0.760	-34.70	974.4		0.063	
1592	190	10	30	5.6	1557.4	-1.501	-14.83	1514.5		0.205	
1593	190	10	30	9.4	1778.7	-1.672	-17.86	1731.0		0.144	
1594	190	10	30	12.2	656.1	0.909	-38.75	635.6		0.054	
1595	190	10	30	13.9	807.5	-1.055	-43.96	782.9		0.044	
1596	190	10	30	17.5	662.0	1.303	-45.35	641.3		0.042	
1597	190	10	31	48.9	1382.3	-1.757	-39.44	1343.3		0.053	
1598	190	10	31	54.3	1225.9	-1.267	-17.33	1190.6		0.153	
1599	190	10	32	8.1	930.6	-1.140	-30.88	902.7		0.073	
1600	190	10	32	49.6	829.9	-1.242	-37.53	804.7		0.057	
1601	190	10	33	33.6	822.0	0.161	-48.10	797.0		0.038	
1602	190	10	35	1.4	893.8	0.008	-39.69	866.9		0.052	
1603	190	10	35	30.4	803.0	-0.544	-29.83	778.4		0.076	
1604	190	10	38	42.9	1020.9	0.677	7.08	990.7		2.551	
1605	190	10	38	56.1	959.3	-0.843	-43.09	930.6		0.046	
1606	190	10	40	58.8	1522.1	-1.417	-29.97	1479.9		0.076	
1607	190	10	41	8.6	701.8	-0.958	-32.76	680.1		0.068	
1608	190	10	41	10.5	1507.5	-1.101	-28.63	1465.6		0.080	
1609	190	10	42	18.7	1115.4	-1.504	-32.38	1082.8		0.069	
1610	190	10	42	43.0	808.3	0.195	-25.09	783.6		0.091	
1611	190	10	44	37.8	869.8	0.557	-30.00	843.5		0.076	
1612	190	10	45	29.1	833.9	1.073	-40.39	808.5		0.051	
1613	190	10	46	59.2	1022.6	0.672	13.83	992.3		5.544	
1614	190	10	49	35.8	736.1	0.261	-21.45	713.4		0.105	
1615	190	10	50	0.8	883.8	1.130	-32.30	857.1		0.069	
1616	190	10	50	19.7	842.7	-1.402	-2.99	817.1		0.800	
1617	190	10	51	27.6	1029.7	-1.535	-19.46	999.3		0.120	
1618	190	10	51	38.4	513.7	-0.874	-32.61	497.3		0.069	
1619	190	10	51	44.4	1505.2	-1.370	-31.56	1463.4		0.071	
1620	190	10	52	11.4	1651.5	-1.324	-11.12	1606.5		0.314	
1621	190	10	52	22.1	1588.8	-1.334	-11.78	1545.2		0.291	
1622	190	10	53	55.0	741.8	-1.148	-25.46	718.9		0.090	
1623	190	10	54	9.5	1026.5	0.734	-36.85	996.2		0.058	
1624	190	10	54	33.1	1369.6	-1.423	-10.70	1330.9		0.329	
1625	190	10	54	51.4	843.2	-1.436	-36.99	817.6		0.058	
1626	190	10	55	35.8	1477.2	-1.225	-34.42	1436.0		0.064	
1627	190	10	55	57.5	1621.2	-1.302	-28.59	1576.9		0.080	
1628	190	10	56	18.6	781.7	-1.060	-41.02	757.8		0.050	
1629	190	10	56	26.7	736.3	-1.609	-40.14	713.6		0.051	
1630	190	10	58	38.2	987.2	-1.456	-44.74	957.8		0.043	
1631	190	11	0	8.3	1059.5	1.092	-6.88	1028.3		0.511	
1632	190	11	0	49.2	603.6	-1.001	-19.68	584.6		0.117	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1633	190	11	1	23.3	1565.2	-1.288	-27.45	1522.1		0.084	
1634	190	11	1	56.7	986.0	-0.744	-37.76	956.7		0.056	
1635	190	11	3	47.4	946.8	-1.239	-34.21	918.5		0.064	
1636	190	11	4	41.0	1579.5	-1.421	-27.63	1536.0		0.083	
1637	190	11	5	10.2	763.7	-1.611	-47.62	740.2		0.039	
1638	190	11	6	52.9	1567.7	-1.345	-22.33	1524.5		0.102	
1639	190	11	7	29.2	1229.5	-1.439	-18.02	1194.1		0.142	
1640	190	11	7	53.6	930.8	-0.234	-45.54	902.9		0.042	
1641	190	11	8	50.1	933.4	-1.936	-36.19	905.4		0.060	
1642	190	11	10	5.9	1576.5	-1.441	-23.27	1533.1		0.098	
1643	190	11	10	35.3	1858.9	-1.154	-29.49	1809.5		0.077	
1644	190	11	11	53.6	527.9	-1.048	-26.98	511.0		0.085	
1645	190	11	12	23.9	517.2	1.185	-41.60	500.7		0.049	
1646	190	11	12	58.9	1613.1	-1.257	-28.99	1569.0		0.079	
1647	190	11	13	9.7	1568.0	-1.353	-30.56	1524.9		0.074	
1648	190	11	14	18.8	1554.9	-1.423	-17.00	1512.1		0.159	
1649	190	11	14	28.1	1584.5	-1.466	-32.19	1541.0		0.070	
1650	190	11	15	1.6	809.2	-0.670	-42.48	784.5		0.047	
1651	190	11	15	23.8	841.1	-1.514	-26.65	815.5		0.086	
1652	190	11	27	23.5	758.4	-1.528	-42.31	735.1		0.047	
1653	190	11	28	2.5	425.4	0.044	-46.69	411.6		0.040	
1654	190	11	28	5.3	945.9	-1.266	-26.08	917.6		0.088	
1655	190	11	28	8.6	1076.8	0.820	-39.34	1045.2		0.053	
1656	190	11	28	13.2	433.6	1.545	-48.24	419.6		0.038	
1657	190	11	28	23.2	1579.9	-1.363	3.82	1536.5		1.751	
1658	190	11	28	58.8	1446.7	-1.809	-38.47	1406.2		0.055	
1659	190	11	29	5.8	1035.6	0.408	-32.08	1005.0		0.070	
1660	190	11	29	19.1	974.1	-0.791	-33.34	945.1		0.067	
1661	190	11	29	22.8	674.5	-1.234	-15.61	653.5		0.187	
1662	190	11	31	51.4	557.9	-1.067	-23.97	540.2		0.095	
1663	190	11	32	13.7	1656.8	-1.290	-32.68	1611.7		0.068	
1664	190	11	32	47.6	747.3	-0.354	-47.55	724.3		0.039	
1665	190	11	32	54.9	1499.8	-1.451	-19.15	1458.2		0.124	
1666	190	11	33	35.4	1327.3	1.511	2.46	1289.6		1.497	
1667	190	11	34	19.0	1213.4	-1.239	-24.86	1178.4		0.092	
1668	190	11	34	45.3	829.0	0.185	-38.00	803.7		0.056	
1669	190	11	34	45.4	763.0	0.882	-28.43	739.5		0.080	
1670	190	11	35	14.5	1498.5	-1.514	-23.01	1456.8		0.099	
1671	190	11	35	17.3	1559.8	-1.435	-35.46	1516.8		0.061	
1672	190	11	36	8.1	449.7	1.263	-34.29	435.2		0.064	
1673	190	11	36	21.1	475.2	2.607	-46.17	459.9		0.041	
1674	190	11	36	46.8	1467.6	-1.412	-15.25	1426.7		0.195	
1675	190	11	37	6.8	1579.5	-1.378	-30.91	1536.1		0.073	

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Table D-1. Detections observed by the EISCAT radar using non-coherent pulse-to-pulse integration (NCI) for the 2006 campaign. - Cont.

nci	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1676	190	11	37	43.9	1483.8	-1.418	-28.14	1442.5		0.081	
1677	190	11	37	58.1	1544.4	-1.302	-19.16	1501.7		0.124	
1678	190	11	38	29.8	2364.6	0.739	-0.20	2305.5		1.103	
1679	190	11	38	47.7	1302.2	0.840	-33.50	1265.1		0.066	
1680	190	11	40	6.8	1531.1	-1.293	-19.35	1488.8		0.122	
1681	190	11	40	26.7	892.8	-1.327	-25.67	865.9		0.089	
1682	190	11	41	52.0	1047.9	1.066	-20.91	1017.0		0.107	
1683	190	11	41	59.3	1584.6	-1.367	-27.23	1541.0		0.084	
1684	190	11	43	49.5	1551.7	-1.395	-20.74	1508.9		0.108	
1685	190	11	44	4.6	1428.0	-0.844	-25.06	1388.0		0.092	
1686	190	11	44	15.3	1474.6	-1.346	-27.73	1433.5		0.083	
1687	190	11	45	18.5	734.7	-1.075	-40.65	712.1		0.050	
1688	190	11	45	31.9	1467.9	-1.208	-37.44	1427.0		0.057	
1689	190	11	46	49.5	744.7	1.131	-23.62	721.8		0.097	
1690	190	11	47	39.6	793.1	0.587	-43.55	768.9		0.045	
1691	190	11	48	11.7	1635.3	-1.322	-21.90	1590.7		0.103	
1692	190	11	48	13.9	1093.0	0.245	-2.32	1060.9		0.864	
1693	190	11	48	54.1	977.4	0.753	-37.58	948.3		0.057	
1694	190	11	49	48.8	1614.2	-1.495	-34.34	1570.0		0.064	
1695	190	11	51	48.8	748.7	-1.350	-48.37	725.7		0.037	
1696	190	11	52	2.3	668.9	-0.786	-41.07	648.1		0.050	
1697	190	11	53	9.6	929.3	0.178	-20.86	901.5		0.108	
1698	190	11	54	29.5	862.9	-2.224	-44.50	836.8		0.043	
1699	190	11	54	48.4	830.7	-1.163	-40.65	805.4		0.050	
1700	190	11	55	17.4	819.3	0.597	-41.28	794.4		0.049	
1701	190	11	55	27.8	1029.9	0.740	7.55	999.4		2.693	
1702	190	11	55	30.3	1656.5	-1.303	-33.53	1611.3		0.066	
1703	190	11	56	18.4	1555.6	-1.221	-28.56	1512.6		0.080	
1704	190	11	57	20.7	1379.0	-1.533	-35.33	1340.0		0.062	
1705	190	11	57	34.1	868.2	-0.761	-41.18	842.0		0.049	
1706	190	11	58	6.2	1173.2	0.274	4.26	1139.2		1.842	
1707	190	11	59	10.2	921.7	1.361	-26.14	894.0		0.088	
1708	190	11	59	30.0	1533.7	-1.413	-25.26	1491.2		0.091	
1709	190	11	59	48.4	905.0	-1.083	-13.55	877.7		0.237	
1710	190	12	0	19.6	1568.0	-1.402	-34.05	1524.8		0.065	
1711	190	12	0	59.2	1560.2	-1.350	-16.24	1517.2		0.174	
1712	190	12	1	19.5	635.2	-0.261	-47.89	615.3		0.038	
1713	190	12	3	28.6	463.5	0.854	-48.58	448.6		0.037	
1714	190	12	4	10.5	1432.1	-1.531	-35.29	1392.0		0.062	
1715	190	12	5	25.1	1451.3	1.041	-21.85	1410.7		0.104	
1716	190	12	6	2.1	1591.3	-1.511	-16.15	1547.6		0.176	
1717	190	12	6	17.3	916.9	-1.126	-26.77	889.4		0.086	

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Table D-2 provides the list of detections observed by the EISCAT radar using the match function method (FMF) scheme during the 2006 campaign. No attempt at correlating detections with known objects has been made.

Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1	189	11	17	54.2	1214.7	-0.245	-23.76	1179.7		0.096	
2	189	11	17	55.2	1451.5	-1.819	-30.31	1410.9		0.075	
3	189	11	18	10.6	877.1	-1.414	-4.26	850.6		0.691	
4	189	11	19	1.0	526.3	1.128	-48.58	509.5		0.037	
5	189	11	20	20.8	1443.5	-1.457	-39.34	1403.1		0.053	
6	189	11	20	56.4	932.7	-1.212	-45.48	904.7		0.042	
7	189	11	21	32.4	1530.5	-1.290	-13.94	1488.2		0.227	
8	189	11	22	27.4	1016.4	1.198	-9.77	986.3		0.366	
9	189	11	22	59.0	1524.7	-1.381	-33.97	1482.5		0.065	
10	189	11	23	53.6	1566.4	-1.202	-18.98	1523.3		0.127	
11	189	11	26	17.0	1502.9	-1.237	-26.68	1461.2		0.086	
12	189	11	26	32.4	1556.5	-1.355	-11.92	1513.6		0.286	
13	189	11	26	38.2	983.5	0.803	6.90	954.2		2.496	
14	189	11	26	52.8	893.1	0.628	-43.04	866.2		0.046	
15	189	11	27	15.8	1493.7	-1.259	-25.32	1452.2		0.091	
16	189	11	27	29.8	1475.5	1.135	-28.76	1434.4		0.079	
17	189	11	27	46.8	1506.9	-1.311	-18.24	1465.1		0.138	
18	189	11	29	26.0	1546.0	-1.315	-23.59	1503.3		0.097	
19	189	11	29	28.8	1137.7	-1.508	-17.22	1104.6		0.155	
20	189	11	29	47.0	1553.3	-1.374	-29.32	1510.5		0.078	
21	189	11	30	30.2	1575.3	-1.392	-29.39	1532.0		0.078	
22	189	11	31	47.0	1555.1	-1.363	-28.86	1512.2		0.079	
23	189	11	32	24.6	862.2	-0.278	-47.82	836.1		0.038	
24	189	11	32	34.0	1434.2	1.375	-32.95	1394.0		0.068	
25	189	11	32	52.0	1484.8	-1.316	-31.27	1443.4		0.072	
26	189	11	33	14.0	1010.2	0.586	-22.21	980.2		0.102	
27	189	11	33	40.0	651.6	-0.925	-35.84	631.3		0.061	
28	189	11	33	51.4	1508.5	-1.441	-33.30	1466.6		0.067	
29	189	11	34	23.0	867.4	-1.962	-48.10	841.1		0.038	
30	189	11	34	50.4	833.1	-0.375	-35.88	807.7		0.060	
31	189	11	35	12.8	1652.6	-1.394	-23.97	1607.6		0.095	
32	189	11	35	14.6	668.3	-1.339	-37.49	647.5		0.057	
33	189	11	35	20.4	1642.8	-1.206	6.26	1598.0		2.321	
34	189	11	36	4.2	972.1	0.234	-39.84	943.2		0.052	
35	189	11	36	12.6	1564.4	-1.436	-28.24	1521.3		0.081	
36	189	11	36	32.4	856.3	-1.025	-27.85	830.3		0.082	
37	189	11	36	36.0	1534.5	-1.412	-32.83	1492.1		0.068	
38	189	11	36	40.0	849.9	-0.591	-43.90	824.1		0.044	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
39	189	11	36	52.6	1289.1	-1.565	-21.95	1252.3		0.103	
40	189	11	37	13.8	533.6	-1.111	-51.32	516.6		0.033	
41	189	11	37	18.2	1000.3	0.802	-43.50	970.6		0.045	
42	189	11	37	26.2	528.2	0.168	-51.24	511.3		0.034	
43	189	11	37	38.8	832.3	-1.080	10.59	807.0		3.819	
44	189	11	38	35.0	1529.1	-1.406	-21.60	1486.8		0.105	
45	189	11	39	38.8	826.7	-1.015	-38.09	801.5		0.056	
46	189	11	42	29.8	677.5	-1.415	-48.73	656.4		0.037	
47	189	11	42	33.6	1563.4	-1.420	-22.75	1520.3		0.100	
48	189	11	42	49.2	1523.2	-1.454	-38.14	1481.0		0.055	
49	189	11	43	29.8	1043.1	0.211	-35.67	1012.4		0.061	
50	189	11	43	32.0	654.2	-1.244	-16.43	633.8		0.170	
51	189	11	43	39.2	1618.5	-1.366	-29.56	1574.2		0.077	
52	189	11	43	40.2	646.7	-0.591	-37.90	626.5		0.056	
53	189	11	43	45.0	645.3	-0.251	-51.32	625.1		0.033	
54	189	11	43	53.2	872.4	-0.782	-47.48	846.0		0.039	
55	189	11	44	13.4	1498.5	-1.470	-24.72	1456.9		0.093	
56	189	11	44	31.4	515.3	-1.632	-50.63	498.8		0.034	
57	189	11	44	35.2	1554.5	-1.391	-22.28	1511.6		0.102	
58	189	11	44	45.8	502.6	-0.095	-48.80	486.5		0.037	
59	189	11	44	48.6	1367.7	-1.725	-38.75	1329.1		0.054	
60	189	11	44	53.4	504.9	0.717	-44.32	488.7		0.044	
61	189	11	45	9.4	830.7	-1.212	-49.01	805.4		0.037	
62	189	11	45	13.0	1427.7	1.002	-34.95	1387.6		0.063	
63	189	11	45	28.0	1499.6	1.012	-27.57	1457.9		0.083	
64	189	11	46	35.0	1475.9	-1.408	-34.05	1434.8		0.065	
65	189	11	48	3.0	1576.8	-1.479	-16.70	1533.4		0.165	
66	189	11	48	22.0	1048.2	0.692	6.76	1017.3		2.457	
67	189	11	48	59.4	932.9	1.278	-38.80	904.9		0.054	
68	189	11	49	2.8	1550.5	-1.280	-26.89	1507.7		0.085	
69	189	11	49	53.4	825.2	-1.059	-37.49	800.1		0.057	
70	189	11	49	56.6	1554.3	-1.467	-36.14	1511.4		0.060	
71	189	11	50	48.8	770.6	-1.115	-28.11	747.0		0.081	
72	189	11	51	36.6	1543.5	-1.448	-32.64	1500.9		0.068	
73	189	11	52	0.2	898.7	1.325	-44.92	871.7		0.043	
74	189	11	52	30.4	1066.1	0.782	-32.91	1034.7		0.068	
75	189	11	54	36.0	669.9	-1.367	-50.25	649.0		0.035	
76	189	11	55	1.0	1614.6	-1.416	-11.38	1570.4		0.305	
77	189	11	56	6.0	905.5	-1.053	-28.79	878.3		0.079	
78	189	11	56	6.6	2186.8	-1.621	-18.62	2130.9		0.132	
79	189	11	56	20.2	1445.4	-1.506	-27.70	1404.9		0.083	
80	189	11	56	45.8	609.1	-1.287	-35.16	589.9		0.062	
81	189	11	56	49.8	1153.2	-1.170	-29.66	1119.7		0.077	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
82	189	11	57	44.0	799.2	1.394	-39.24	774.7		0.053	
83	189	11	58	21.6	1294.1	0.832	-15.97	1257.1		0.179	
84	189	11	58	32.2	1575.2	-1.350	-11.99	1531.9		0.284	
85	189	11	58	45.6	1499.1	-1.265	-19.11	1457.4		0.125	
86	189	11	58	54.6	774.8	-1.227	-38.71	751.0		0.054	
87	189	11	59	0.2	1628.0	-1.591	-35.54	1583.5		0.061	
88	189	11	59	4.4	1577.9	-1.542	-35.04	1534.5		0.062	
89	189	12	0	10.8	1087.3	-1.530	-34.74	1055.4		0.063	
90	189	12	0	24.2	1564.4	-1.353	-21.65	1521.3		0.104	
91	189	12	2	30.8	882.1	-2.441	-41.39	855.4		0.049	
92	189	12	2	57.0	836.8	-0.998	-18.58	811.4		0.133	
93	189	12	3	8.2	1562.2	-1.475	-11.25	1519.2		0.309	
94	189	12	3	16.2	721.6	-1.331	-43.09	699.3		0.046	
95	189	12	3	17.6	630.2	-0.819	-37.53	610.5		0.057	
96	189	12	3	18.6	718.5	-1.242	-44.80	696.3		0.043	
97	189	12	3	43.0	635.2	1.202	-47.55	615.3		0.039	
98	189	12	3	46.2	711.9	0.765	-30.88	689.9		0.073	
99	189	12	4	36.4	918.1	-1.104	-27.66	890.5		0.083	
100	189	12	4	41.4	599.1	0.403	-54.47	580.2		0.030	
101	189	12	4	53.8	1520.2	-1.261	-31.16	1478.1		0.072	
102	189	12	5	59.2	1049.6	0.684	8.31	1018.6		2.937	
103	189	12	6	13.8	1384.0	-1.565	-23.59	1345.0		0.097	
104	189	12	6	38.6	1553.8	-1.474	-31.82	1511.0		0.071	
105	189	12	7	26.2	1580.9	-1.487	-25.18	1537.4		0.091	
106	189	12	8	15.8	548.9	-1.195	-52.28	531.5		0.032	
107	189	12	8	44.6	924.6	1.461	-32.04	896.8		0.070	
108	189	12	8	52.6	1040.6	0.724	-24.72	1009.8		0.093	
109	189	12	8	58.8	853.0	1.077	-45.41	827.1		0.042	
110	189	12	9	3.0	1050.3	1.174	-40.76	1019.3		0.050	
111	189	12	9	36.6	1749.6	-1.237	-15.06	1702.5		0.199	
112	189	12	10	20.4	1017.3	1.146	-6.09	987.2		0.560	
113	189	12	10	31.0	637.7	-1.092	-21.88	617.7		0.103	
114	189	12	11	42.0	1553.6	-1.445	-24.50	1510.7		0.094	
115	189	12	11	48.2	1422.7	-1.253	-29.09	1382.8		0.078	
116	189	12	11	54.6	583.8	-2.106	-44.62	565.3		0.043	
117	189	12	13	54.8	721.1	-1.410	-15.95	698.8		0.180	
118	189	12	14	4.8	1644.8	-1.348	-15.92	1600.0		0.181	
119	189	12	14	13.4	1060.0	0.723	-41.55	1028.8		0.049	
120	189	12	15	31.0	1049.2	1.175	13.05	1018.3		5.071	
121	189	12	16	4.6	936.8	-1.153	-27.48	908.7		0.083	
122	189	12	17	2.0	524.5	0.515	-29.80	507.8		0.076	
123	189	12	17	20.8	1506.8	-1.246	-28.50	1465.0		0.080	
124	189	12	17	47.2	880.1	-1.436	-24.53	853.5		0.093	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
125	189	12	18	29.2	762.8	-1.275	-45.60	739.3		0.042	
126	189	12	20	19.6	873.2	-1.424	-40.45	846.8		0.051	
127	189	12	22	3.2	1714.4	-1.373	-22.36	1668.0		0.102	
128	189	12	22	6.4	1029.0	-1.084	-24.86	998.6		0.092	
129	189	12	22	10.6	1442.6	0.825	-33.50	1402.2		0.066	
130	189	12	22	11.6	1028.9	-0.647	-40.39	998.5		0.051	
131	189	12	22	13.2	1045.9	0.218	-42.81	1015.0		0.046	
132	189	12	22	17.0	1448.4	0.981	-38.28	1407.9		0.055	
133	189	12	22	20.0	1047.8	0.505	-20.03	1016.9		0.112	
134	189	12	22	21.6	1453.6	1.153	-29.19	1413.0		0.078	
135	189	12	22	24.2	1050.3	0.692	-17.56	1019.4		0.149	
136	189	12	22	48.0	1618.6	-1.535	-19.55	1574.3		0.119	
137	189	12	22	56.2	655.3	-1.044	-44.98	634.8		0.043	
138	189	12	23	23.0	950.0	-1.101	-19.87	921.6		0.115	
139	189	12	24	21.0	1047.7	-1.150	-17.01	1016.8		0.159	
140	189	12	24	44.8	721.1	-1.395	-49.30	698.8		0.036	
141	189	12	25	51.2	1502.8	-1.180	-33.14	1461.1		0.067	
142	189	12	25	59.4	591.5	1.438	-49.22	572.8		0.036	
143	189	12	26	13.2	1560.9	-1.463	3.33	1517.9		1.656	
144	189	12	26	38.6	839.0	0.332	-47.08	813.5		0.039	
145	189	12	26	54.6	1636.8	-1.490	-21.11	1592.1		0.107	
146	189	12	27	15.0	571.3	0.127	-44.08	553.2		0.044	
147	189	12	27	42.2	646.6	-1.627	-47.48	626.4		0.039	
148	189	12	27	45.4	947.7	-1.453	-40.14	919.3		0.051	
149	189	12	28	1.8	716.1	0.129	-44.14	693.9		0.044	
150	189	12	28	29.8	1654.6	-1.404	-21.60	1609.5		0.105	
151	189	12	28	42.0	1538.7	-1.503	-18.44	1496.2		0.135	
152	189	12	28	50.8	1784.7	-0.874	-29.25	1736.9		0.078	
153	189	12	29	24.8	707.1	-1.082	-39.94	685.2		0.052	
154	189	12	30	50.0	1549.5	-1.432	-16.79	1506.8		0.163	
155	189	12	30	50.0	1562.7	-1.453	-16.79	1519.7		0.163	
156	189	12	31	24.0	1589.1	-1.510	-15.47	1545.5		0.190	
157	189	12	31	51.2	1003.5	-0.781	-41.66	973.7		0.048	
158	189	12	32	12.2	997.8	0.228	-44.26	968.2		0.044	
159	189	12	32	17.0	540.2	-0.123	-52.28	523.1		0.032	
160	189	12	32	22.2	1714.6	-1.365	-28.05	1668.3		0.082	
161	189	12	34	15.6	928.3	-1.195	-25.03	900.4		0.092	
162	189	12	35	3.6	802.7	0.274	5.43	778.1		2.108	
163	189	12	36	33.2	832.0	-1.558	-46.30	806.7		0.041	
164	189	12	36	38.2	1558.2	-1.457	-20.38	1515.2		0.110	
165	189	12	36	38.2	1559.0	-1.453	-20.38	1516.0		0.110	
166	189	12	36	40.2	822.8	-1.154	-27.14	797.7		0.085	
167	189	12	36	40.2	822.8	-1.153	-27.14	797.7		0.085	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
168	189	12	36	43.8	1532.8	-1.389	-6.24	1490.4		0.550	
169	189	12	36	59.6	812.0	0.043	-43.32	787.3		0.045	
170	189	12	37	10.8	1535.8	-1.429	-35.46	1493.4		0.061	
171	189	12	38	40.6	1025.7	1.076	-28.69	995.4		0.080	
172	189	12	38	48.4	738.1	-1.468	-44.08	715.3		0.044	
173	189	12	40	11.2	1510.1	-1.334	-15.38	1468.2		0.192	
174	189	12	41	25.8	889.5	1.145	-34.83	862.7		0.063	
175	189	12	41	50.0	1584.1	-1.665	-28.96	1540.6		0.079	
176	189	12	41	52.0	769.2	-1.285	-45.29	745.6		0.042	
177	189	12	41	56.6	1575.2	-1.518	-2.06	1531.8		0.890	
178	189	12	42	3.6	1563.7	-1.330	-29.29	1520.6		0.078	
179	189	12	42	25.2	1597.6	-1.547	-20.26	1553.8		0.110	
180	189	12	42	43.2	1619.2	-1.504	-10.74	1574.9		0.328	
181	189	12	43	10.0	923.2	-1.434	-14.03	895.4		0.224	
182	189	12	43	38.0	879.1	-1.443	-30.35	852.5		0.075	
183	189	12	44	2.2	1736.4	-1.403	-33.07	1689.6		0.067	
184	189	12	44	25.4	1466.1	-1.515	-27.57	1425.2		0.083	
185	189	12	44	49.4	1719.1	-1.388	-25.72	1672.7		0.089	
186	189	12	44	53.4	1587.3	-1.477	-33.73	1543.7		0.066	
187	189	12	45	42.8	1399.7	-1.438	-33.93	1360.3		0.065	
188	189	12	46	0.2	588.5	-1.167	-26.59	569.9		0.086	
189	189	12	46	29.0	1416.4	0.704	-34.95	1376.6		0.063	
190	189	12	46	29.0	1416.5	0.714	-34.95	1376.7		0.063	
191	189	12	46	30.2	1012.6	0.661	-38.90	982.6		0.054	
192	189	12	46	30.2	1012.6	0.665	-38.90	982.6		0.054	
193	189	12	46	38.8	1575.8	-1.478	-17.65	1532.5		0.148	
194	189	12	47	12.8	1543.3	-1.414	-24.11	1500.7		0.095	
195	189	12	47	27.6	862.0	1.166	-11.83	835.9		0.289	
196	189	12	47	54.6	822.6	-1.098	-49.08	797.5		0.036	
197	189	12	50	22.0	990.4	0.859	-45.79	960.9		0.041	
198	189	12	51	48.2	1033.5	-0.777	-37.21	1002.9		0.057	
199	189	12	52	28.2	810.7	0.294	-26.05	786.0		0.088	
200	189	12	52	31.0	811.7	0.462	-34.54	787.0		0.064	
201	189	12	52	33.6	1516.5	-1.454	-20.29	1474.4		0.110	
202	189	12	53	40.8	983.1	1.210	-40.81	953.8		0.050	
203	189	12	53	54.8	1199.8	-1.886	-39.69	1165.1		0.052	
204	189	12	54	11.2	912.3	-1.436	-43.44	884.9		0.045	
205	189	12	54	28.8	1435.7	-1.546	-19.23	1395.4		0.123	
206	189	12	54	44.6	1510.8	-1.491	-35.20	1468.9		0.062	
207	189	12	55	47.8	782.7	-0.977	-35.93	758.7		0.060	
208	189	12	55	56.8	1571.6	-1.505	-6.84	1528.3		0.513	
209	189	12	56	45.2	1531.2	-1.416	-27.51	1488.8		0.083	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
210	189	12	57	20.0	1561.1	-1.512	-15.20	1518.0		0.196	
211	189	12	57	22.8	978.3	1.214	-40.29	949.1		0.051	
212	189	12	57	59.2	578.8	0.170	-52.36	560.5		0.032	
213	189	12	58	21.6	987.4	1.219	-40.04	958.0		0.052	
214	189	12	58	36.4	625.1	1.347	-46.75	605.5		0.040	
215	189	12	59	17.6	1533.6	-1.508	-32.34	1491.2		0.069	
216	189	12	59	45.2	1592.1	-1.459	-24.44	1548.4		0.094	
217	189	13	1	4.2	1050.3	-1.121	-25.67	1019.4		0.089	
218	189	13	1	39.2	1534.9	-1.498	-20.91	1492.4		0.107	
219	189	13	3	59.8	848.8	0.910	-16.36	823.0		0.172	
220	189	13	4	26.4	1137.9	0.281	-9.50	1104.8		0.378	
221	189	13	4	31.0	1139.6	0.456	-32.19	1106.4		0.070	
222	189	13	4	31.4	1517.7	-1.474	-29.80	1475.7		0.076	
223	189	13	4	31.4	1517.7	-1.475	-29.80	1475.6		0.076	
224	189	13	4	36.6	774.5	-1.953	-5.01	750.7		0.634	
225	189	13	5	18.8	1625.4	-1.582	-12.07	1581.0		0.281	
226	189	13	6	15.0	848.6	-1.438	-45.54	822.8		0.042	
227	189	13	6	16.0	710.5	-1.260	-39.19	688.4		0.053	
228	189	13	6	23.8	836.6	-1.378	-22.44	811.2		0.101	
229	189	13	7	58.4	929.9	0.821	-37.30	902.0		0.057	
230	189	13	8	23.6	588.3	-1.468	-31.27	569.8		0.072	
231	189	13	9	11.8	1550.3	-1.500	-19.49	1507.5		0.120	
232	189	13	9	35.2	1034.8	0.690	10.06	1004.2		3.593	
233	189	13	12	1.8	921.9	-1.402	-45.79	894.2		0.041	
234	189	13	12	5.8	1524.9	-1.474	-32.00	1482.7		0.070	
235	189	13	12	13.4	909.7	-0.839	-44.74	882.3		0.043	
236	189	13	12	15.6	1508.2	-1.527	-28.05	1466.4		0.082	
237	189	13	12	20.0	1558.3	-1.502	-33.30	1515.3		0.067	
238	189	13	12	24.6	1674.9	-1.334	-25.12	1629.4		0.091	
239	189	13	13	37.4	1544.3	-1.421	-28.86	1501.7		0.079	
240	189	13	14	25.8	1014.1	0.781	-41.76	984.1		0.048	
241	189	13	14	54.8	1574.3	-1.363	-20.09	1530.9		0.112	
242	189	13	15	13.2	1516.7	-1.335	-30.88	1474.6		0.073	
243	189	13	15	53.0	885.5	-1.125	-45.10	858.8		0.042	
244	189	13	16	46.0	1563.8	-1.548	-25.32	1520.7		0.091	
245	189	13	16	51.8	1495.0	-1.536	-18.57	1453.4		0.133	
246	189	13	17	12.4	1660.4	-1.442	-18.60	1615.2		0.133	
247	189	13	18	1.8	750.2	-1.381	-44.32	727.1		0.044	
248	189	13	19	11.0	1522.1	-1.668	-27.66	1479.9		0.083	
249	189	13	19	11.6	1475.8	-1.533	-28.56	1434.7		0.080	
250	189	13	19	18.6	1510.2	-1.467	-27.23	1468.3		0.084	
251	189	13	19	37.6	796.7	-0.929	-41.28	772.4		0.049	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
252	189	13	19	37.6	796.7	-0.929	-41.28	772.4		0.049	
253	189	13	19	40.2	1564.0	-1.550	-27.45	1520.9		0.084	
254	189	13	19	48.8	1612.6	-1.514	-27.63	1568.4		0.083	
255	189	13	19	55.0	1541.9	-1.410	-35.41	1499.2		0.062	
256	189	13	20	18.6	862.6	-1.308	-46.89	836.4		0.040	
257	189	13	20	46.2	1557.0	-1.476	3.30	1514.0		1.650	
258	189	13	21	7.0	825.6	-1.251	-37.30	800.5		0.057	
259	189	13	22	27.8	707.6	-1.126	-33.65	685.7		0.066	
260	189	13	23	14.4	1138.5	-1.378	-37.26	1105.3		0.057	
261	189	13	24	13.2	891.0	-1.442	-42.48	864.2		0.047	
262	189	13	24	49.0	1526.0	-1.468	-36.41	1483.7		0.059	
263	189	13	25	36.8	1652.7	-1.674	-26.35	1607.7		0.087	
264	189	13	25	40.0	1552.3	-1.504	-30.07	1509.4		0.076	
265	189	13	26	56.2	1510.3	-1.525	-31.67	1468.4		0.071	
266	189	13	28	20.6	1592.9	-1.559	-27.63	1549.2		0.083	
267	189	13	28	55.0	786.8	1.395	-24.06	762.7		0.095	
268	189	13	29	50.6	840.6	-1.411	-18.02	815.0		0.142	
269	189	13	31	23.4	1809.0	-1.874	-25.93	1760.7		0.089	
270	189	13	31	57.6	650.9	-1.283	-51.56	630.6		0.033	
271	189	13	32	26.4	1533.3	-1.566	-16.85	1490.9		0.162	
272	189	13	32	41.6	887.9	1.241	-27.14	861.1		0.085	
273	189	13	32	45.6	1025.2	0.761	-27.76	994.9		0.083	
274	189	13	32	47.2	895.5	1.538	-29.76	868.5		0.076	
275	189	13	32	53.8	1033.0	1.122	-41.28	1002.5		0.049	
276	189	13	33	32.0	1508.5	-1.509	8.11	1466.7		2.871	
277	189	13	34	15.6	1028.6	0.705	-3.97	998.1		0.715	
278	189	13	34	59.0	826.6	1.203	-35.08	801.4		0.062	
279	189	13	35	15.0	1586.7	-1.439	-33.73	1543.1		0.066	
280	189	13	36	35.4	377.6	0.708	-45.35	365.3		0.042	
281	189	13	36	42.6	1008.2	0.722	-21.57	978.2		0.105	
282	189	13	36	59.4	944.6	-1.253	-36.32	916.4		0.059	
283	189	13	37	55.2	1674.6	-1.373	-32.42	1629.1		0.069	
284	189	13	39	5.0	1655.3	-1.779	-36.76	1610.2		0.058	
285	189	13	39	7.4	1512.6	-1.401	-24.36	1470.7		0.094	
286	189	13	39	17.4	874.8	-1.417	-33.42	848.3		0.066	
287	189	13	39	47.0	1161.1	-1.201	-25.84	1127.4		0.089	
288	189	13	40	21.2	879.0	-1.345	-43.04	852.5		0.046	
289	189	13	40	49.0	1663.6	-1.523	-28.30	1618.4		0.081	
290	189	13	41	58.4	959.1	0.703	-44.14	930.4		0.044	
291	189	13	42	16.0	876.6	1.361	-0.12	850.1		1.113	
292	189	13	49	16.8	1474.0	-1.472	-33.03	1432.9		0.067	
293	189	13	49	24.0	486.4	0.392	-40.70	470.8		0.050	
294	189	13	49	51.0	706.5	-1.186	-28.63	684.6		0.080	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
295	189	13	50	39.0	1155.8	-1.592	-38.61	1122.2		0.054	
296	189	13	51	13.0	887.0	-1.259	-17.83	860.2		0.145	
297	189	13	51	43.4	651.7	-1.491	-41.82	631.4		0.048	
298	189	13	52	48.2	1572.9	-1.486	-12.28	1529.6		0.275	
299	189	13	53	4.2	1612.5	-1.384	-32.76	1568.3		0.068	
300	189	13	53	21.2	1467.2	-1.500	-21.50	1426.3		0.105	
301	189	13	54	24.0	1811.4	-1.289	-22.77	1763.0		0.100	
302	189	13	55	1.2	1567.3	-1.542	-23.35	1524.1		0.098	
303	189	13	56	54.0	1550.2	-1.537	-19.27	1507.4		0.123	
304	189	13	57	54.0	1032.2	1.377	-26.35	1001.7		0.087	
305	189	13	58	30.0	628.3	-1.351	-46.95	608.6		0.040	
306	189	13	59	39.0	887.2	-1.241	-46.89	860.4		0.040	
307	189	13	59	41.8	1007.8	0.721	-43.09	977.9		0.046	
308	189	13	59	55.4	1530.9	-1.498	-21.77	1488.6		0.104	
309	189	14	0	2.6	1407.7	-1.431	-35.46	1368.1		0.061	
310	189	14	0	25.8	1012.5	-0.804	-39.00	982.5		0.054	
311	189	14	0	28.4	1140.8	-1.205	-38.32	1107.6		0.055	
312	189	14	1	0.4	1327.8	-1.657	-27.35	1290.1		0.084	
313	189	14	1	2.0	1611.5	-1.493	-8.02	1567.3		0.448	
314	189	14	1	46.4	833.9	-1.456	-44.62	808.5		0.043	
315	189	14	3	23.0	1152.1	-1.196	-39.64	1118.6		0.052	
316	189	14	5	7.8	1587.0	-1.377	-37.49	1543.4		0.057	
317	189	14	6	41.8	1026.9	0.803	-31.45	996.5		0.072	
318	189	14	7	9.4	804.1	-1.688	-42.04	779.6		0.048	
319	189	14	7	36.2	612.9	1.308	-50.86	593.6		0.034	
320	189	14	7	40.2	717.7	-1.150	-50.25	695.5		0.035	
321	189	14	7	45.6	1516.8	-1.459	-25.67	1474.7		0.089	
322	189	14	9	40.8	810.5	-1.484	-43.44	785.8		0.045	
323	189	14	11	4.4	1152.8	-1.247	-27.23	1119.3		0.084	
324	189	14	12	16.8	1056.4	1.415	-42.37	1025.3		0.047	
325	189	14	12	42.8	1623.9	-1.508	-33.42	1579.5		0.066	
326	189	14	13	9.0	1023.5	0.680	-1.70	993.2		0.927	
327	189	14	14	18.4	1215.8	-1.631	-16.75	1180.8		0.164	
328	189	14	14	24.8	1588.0	-1.457	-33.38	1544.3		0.067	
329	189	14	17	36.2	882.1	-1.340	-44.68	855.5		0.043	
330	189	14	18	33.0	908.8	-1.384	-20.29	881.4		0.110	
331	189	14	19	1.2	1503.2	-1.535	-10.17	1461.4		0.350	
332	189	14	19	57.2	791.3	-1.146	-49.37	767.1		0.036	
333	189	14	20	23.0	1546.7	-1.392	-33.65	1504.0		0.066	
334	189	14	21	4.4	1023.3	1.141	-0.13	993.0		1.111	
335	189	14	21	21.6	1491.0	-1.491	-30.14	1449.5		0.075	
336	189	14	22	18.4	909.9	-1.235	-43.38	882.5		0.045	
337	189	14	22	35.4	897.9	-0.277	-44.26	870.9		0.044	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
338	189	14	22	57.2	1013.5	-0.794	-40.76	983.5		0.050	
339	189	14	23	22.2	1010.4	0.873	-27.70	980.5		0.083	
340	189	14	26	5.2	660.7	0.120	-43.15	640.1		0.046	
341	189	14	27	22.6	516.2	-0.674	-52.60	499.7		0.032	
342	189	14	27	53.0	830.3	-1.412	-28.46	805.1		0.080	
343	189	14	28	40.0	1503.4	-1.551	-25.20	1461.6		0.091	
344	189	14	28	49.4	881.5	-1.223	-44.56	854.8		0.043	
345	189	14	28	57.4	840.4	-1.329	-44.02	814.8		0.044	
346	189	14	29	10.2	1721.4	-0.803	-22.05	1674.9		0.103	
347	189	14	29	24.4	794.0	-0.773	-46.69	769.7		0.040	
348	189	14	30	14.4	693.0	-1.312	-43.96	671.5		0.044	
349	189	14	30	31.6	1534.7	-1.492	-3.81	1492.3		0.727	
350	189	14	30	34.6	987.7	-0.802	-34.34	958.4		0.064	
351	189	14	30	37.4	1526.5	-1.334	-28.79	1484.2		0.079	
352	189	14	31	44.0	1102.9	1.135	-25.12	1070.6		0.091	
353	189	14	32	39.8	1145.5	0.704	-12.30	1112.2		0.274	
354	189	14	32	54.2	1510.7	-1.528	-37.58	1468.8		0.057	
355	189	14	33	15.8	1565.4	-1.472	-19.19	1522.3		0.124	
356	189	14	35	22.8	1586.8	-1.570	-33.18	1543.2		0.067	
357	189	14	35	56.8	1165.7	-1.234	-39.69	1131.9		0.052	
358	189	14	36	49.8	1717.5	-0.932	-25.55	1671.1		0.090	
359	189	14	40	21.8	377.5	-0.870	-40.45	365.1		0.051	
360	189	14	40	44.8	850.0	-1.435	-35.12	824.2		0.062	
361	189	14	40	47.2	1035.6	0.656	-41.39	1005.0		0.049	
362	189	14	41	27.8	1001.4	0.749	8.47	971.7		2.993	
363	189	14	44	30.8	1626.7	-1.425	-24.95	1582.2		0.092	
364	189	14	45	59.2	1608.9	-1.459	0.30	1564.8		1.169	
365	189	14	45	59.4	1587.8	-1.741	-9.28	1544.2		0.388	
366	189	14	46	43.2	824.8	-1.466	3.58	799.7		1.704	
367	189	14	47	25.8	662.5	0.942	-6.89	641.8		0.511	
368	189	14	48	31.4	631.5	1.083	-52.11	611.7		0.032	
369	189	14	48	40.4	921.4	1.148	-24.28	893.7		0.094	
370	189	14	50	43.4	667.3	-0.759	-43.73	646.5		0.045	
371	189	14	50	53.4	999.8	1.114	-44.14	970.1		0.044	
372	189	14	52	1.8	1535.5	-1.382	-28.59	1493.0		0.080	
373	189	14	53	35.0	1575.0	-1.473	-24.03	1531.7		0.095	
374	189	14	53	42.8	1347.4	-1.367	-20.86	1309.2		0.108	
375	189	14	55	14.4	704.9	0.259	-16.73	683.0		0.164	
376	189	14	55	33.6	1531.8	-1.536	-36.72	1489.4		0.059	
377	189	14	55	46.4	1085.4	-1.731	-39.89	1053.5		0.052	
378	189	14	56	7.6	813.8	0.258	-2.21	788.9		0.875	
379	189	14	57	29.2	696.2	-1.041	-47.15	674.6		0.039	
380	189	14	59	14.6	982.0	-1.177	-18.95	952.8		0.127	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
381	189	15	0	40.4	589.1	1.572	-31.71	570.5		0.071	
382	189	15	1	52.4	931.0	-1.710	-45.98	903.1		0.041	
383	189	15	2	42.0	892.4	1.177	-32.45	865.5		0.069	
384	189	15	4	4.4	597.2	1.467	-45.92	578.4		0.041	
385	189	15	4	25.6	960.2	0.689	-14.33	931.5		0.217	
386	189	15	4	50.8	506.7	-1.517	-49.66	490.5		0.036	
387	189	15	5	16.8	907.8	-1.423	-40.34	880.5		0.051	
388	189	15	5	21.4	804.3	0.564	-47.62	779.8		0.039	
389	189	15	6	38.2	756.6	-0.988	-48.44	733.4		0.037	
390	189	15	8	2.4	759.9	-1.075	-27.48	736.6		0.083	
391	189	15	8	27.0	1027.4	0.966	-33.46	997.1		0.066	
392	189	15	11	3.4	1771.5	-1.436	-14.86	1723.9		0.204	
393	189	15	11	6.6	1493.6	-1.367	-30.45	1452.1		0.074	
394	189	15	11	39.8	649.2	-0.712	-45.66	628.9		0.042	
395	189	15	11	41.0	890.2	-1.239	-8.70	863.4		0.414	
396	189	15	11	43.4	634.9	1.173	-13.35	615.0		0.243	
397	189	15	12	13.2	909.5	-1.753	-42.70	882.2		0.047	
398	189	15	13	51.0	1325.6	0.864	-33.03	1287.9		0.067	
399	189	15	14	55.8	1006.6	1.115	-29.05	976.7		0.079	
400	189	15	16	26.2	1464.7	-1.303	-13.14	1423.8		0.249	
401	189	15	16	57.0	1042.5	-1.494	-18.87	1011.7		0.129	
402	189	15	17	23.4	631.8	0.596	-48.03	612.0		0.038	
403	189	15	17	55.2	1535.8	-1.672	-36.72	1493.4		0.059	
404	189	15	17	58.6	895.6	-1.504	-41.44	868.6		0.049	
405	189	15	18	1.4	1526.2	-1.509	-26.65	1484.0		0.086	
406	189	15	18	6.6	884.7	-1.007	-46.49	857.9		0.040	
407	189	15	18	7.4	1517.6	-1.335	-35.93	1475.6		0.060	
408	189	15	18	9.2	882.8	-0.902	-46.62	856.1		0.040	
409	189	15	18	37.2	865.8	-1.411	-41.33	839.6		0.049	
410	189	15	19	2.2	1025.5	0.749	11.91	995.1		4.443	
411	189	15	19	13.2	1012.0	0.759	-38.42	982.0		0.055	
412	189	15	20	30.6	1450.8	-1.837	-34.91	1410.2		0.063	
413	189	15	20	32.8	805.4	-1.419	-37.17	780.8		0.058	
414	189	15	22	2.4	690.0	-0.961	-40.76	668.5		0.050	
415	189	15	23	21.2	826.3	-1.455	-35.33	801.1		0.062	
416	189	15	23	41.4	666.4	1.251	-28.17	645.6		0.081	
417	189	15	25	37.6	968.8	0.306	-17.67	939.9		0.148	
418	189	15	26	41.4	670.1	1.196	-25.49	649.2		0.090	
419	189	15	28	31.8	1004.9	1.242	-30.80	975.1		0.073	
420	189	15	34	51.8	835.8	-1.501	-46.36	810.4		0.040	
421	189	15	35	3.6	1441.3	-1.585	-37.62	1400.9		0.057	
422	189	15	36	4.4	855.3	-0.696	-27.07	829.3		0.085	
423	189	15	37	59.4	910.4	1.192	-40.39	883.0		0.051	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
424	189	15	38	3.4	1348.4	-1.631	-34.54	1310.2		0.064	
425	189	15	39	0.4	721.9	-1.380	-15.24	699.6		0.195	
426	189	15	40	8.0	1310.5	-0.369	-29.69	1273.2		0.077	
427	189	15	40	17.6	1727.6	0.544	-18.93	1681.0		0.128	
428	189	15	42	57.0	933.4	1.335	-28.08	905.4		0.082	
429	189	15	44	52.2	979.5	1.176	-44.74	950.3		0.043	
430	189	15	45	27.6	880.3	-1.412	-12.47	853.7		0.268	
431	189	15	45	34.4	1297.1	-0.361	-34.17	1260.1		0.065	
432	189	15	45	52.0	1677.2	-1.383	-23.73	1631.6		0.096	
433	189	15	48	20.8	1063.0	0.754	-42.09	1031.7		0.048	
434	189	15	49	19.4	1306.8	-0.377	-38.95	1269.5		0.054	
435	189	15	49	41.2	848.2	1.042	-46.89	822.4		0.040	
436	189	15	50	16.0	727.2	-1.448	-21.33	704.8		0.106	
437	189	15	51	6.4	838.4	-1.387	-30.63	812.9		0.074	
438	189	15	51	27.0	1274.7	-0.777	-33.89	1238.2		0.065	
439	189	15	52	29.0	822.7	-1.149	-21.13	797.6		0.106	
440	189	15	52	34.6	1316.9	-0.392	-18.72	1279.5		0.131	
441	189	15	53	23.4	1611.0	-1.405	-27.85	1566.9		0.082	
442	189	15	53	45.8	1302.8	-0.337	-29.80	1265.7		0.076	
443	189	15	54	34.4	574.5	-1.362	-4.94	556.3		0.639	
444	189	15	55	20.0	546.0	1.292	-44.56	528.7		0.043	
445	189	15	55	37.8	1540.8	-1.508	-22.38	1498.2		0.101	
446	189	15	56	21.6	1040.3	0.663	-41.50	1009.5		0.049	
447	189	15	56	54.6	1359.8	-0.381	-39.29	1321.3		0.053	
448	189	15	57	8.6	847.0	-1.509	-11.28	821.3		0.308	
449	189	15	57	18.2	1350.1	-0.413	-35.63	1311.8		0.061	
450	189	15	57	40.6	1197.6	1.786	-19.54	1163.0		0.119	
451	189	15	58	11.0	1360.1	-0.392	-26.08	1321.6		0.088	
452	189	15	58	14.4	919.6	-0.173	-11.22	891.9		0.310	
453	189	15	58	27.2	1612.3	-1.173	-36.63	1568.1		0.059	
454	189	15	59	7.4	1310.8	-0.382	-32.04	1273.5		0.070	
455	189	15	59	10.6	1102.8	-1.516	-25.09	1070.5		0.091	
456	189	16	0	37.0	1407.9	-1.566	-20.13	1368.3		0.111	
457	189	16	1	27.6	1335.2	-0.346	-40.29	1297.3		0.051	
458	189	16	1	31.0	1314.0	-0.414	-36.28	1276.6		0.060	
459	189	16	1	53.8	1346.9	-0.404	-38.09	1308.8		0.056	
460	189	16	2	20.6	1298.6	-0.362	-40.91	1261.5		0.050	
461	189	16	2	35.0	1328.5	-0.394	-31.16	1290.8		0.072	
462	189	16	3	4.0	1324.0	-0.342	-37.30	1286.4		0.057	
463	189	16	3	37.0	1308.9	-0.368	-32.72	1271.6		0.068	
464	189	16	3	58.2	978.7	-0.825	-35.29	949.6		0.062	
465	189	16	4	20.8	847.3	-1.217	-44.68	821.6		0.043	
466	189	16	4	51.6	1328.5	-0.437	-40.29	1290.8		0.051	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
467	189	16	5	23.2	1312.1	-0.377	-30.45	1274.8		0.074	
468	189	16	5	57.6	928.1	1.302	-23.78	900.2		0.096	
469	189	16	6	47.2	696.1	-1.863	-45.60	674.5		0.042	
470	189	16	7	17.0	737.1	-1.321	-42.26	714.4		0.047	
471	189	16	8	49.2	651.2	0.772	-47.48	630.8		0.039	
472	189	16	10	19.4	1660.3	-1.372	-30.45	1615.1		0.074	
473	189	16	11	59.0	1084.8	1.188	-24.92	1052.9		0.092	
474	189	16	12	10.4	1296.1	-0.334	-36.67	1259.1		0.059	
475	189	16	12	24.2	947.5	0.741	7.81	919.1		2.772	
476	189	16	12	54.4	1442.2	-1.687	-36.45	1401.9		0.059	
477	189	16	12	59.0	1002.1	1.142	-27.07	972.4		0.085	
478	189	16	13	0.6	1432.2	-1.514	-10.56	1392.1		0.334	
479	189	16	13	23.4	1141.7	-1.524	-39.34	1108.4		0.053	
480	189	16	14	47.8	912.3	-1.445	-32.76	884.9		0.068	
481	189	16	15	8.2	697.1	-1.173	-38.42	675.5		0.055	
482	189	16	15	14.0	1307.0	-0.374	-29.76	1269.8		0.076	
483	189	16	15	21.8	596.3	1.258	-35.58	577.5		0.061	
484	189	16	15	26.4	1306.0	-0.362	-39.59	1268.8		0.052	
485	189	16	15	34.4	987.2	-1.563	-24.69	957.8		0.093	
486	189	16	15	51.8	1658.1	-1.820	-34.21	1613.0		0.064	
487	189	16	16	43.2	1374.3	0.757	-22.75	1335.5		0.100	
488	189	16	16	48.0	996.7	0.917	-45.54	967.0		0.042	
489	189	16	17	11.8	1582.2	-1.451	-28.05	1538.7		0.082	
490	189	16	17	34.2	708.3	-1.141	-50.86	686.4		0.034	
491	189	16	17	44.0	1075.5	0.702	-30.42	1043.9		0.075	
492	189	16	18	3.4	1339.9	-0.384	-40.24	1301.9		0.051	
493	189	16	18	34.6	1423.0	-1.403	-25.26	1383.0		0.091	
494	189	16	18	38.0	1296.3	-0.360	-32.08	1259.3		0.070	
495	189	16	19	8.4	1639.4	-1.494	-13.26	1594.6		0.245	
496	189	16	22	5.8	1102.6	-1.181	-20.91	1070.3		0.107	
497	189	16	22	30.4	773.9	1.200	-33.14	750.1		0.067	
498	189	16	23	0.4	999.4	0.761	-36.32	969.7		0.059	
499	189	16	24	15.6	1501.7	-1.541	-36.76	1460.0		0.058	
500	189	16	25	10.0	564.3	-1.331	-24.33	546.4		0.094	
501	189	16	28	31.6	2304.2	1.385	-14.89	2246.1		0.203	
502	189	16	30	20.6	1309.4	-0.402	-32.87	1272.1		0.068	
503	189	16	32	6.0	1315.2	-0.356	-39.99	1277.8		0.052	
504	189	16	32	15.6	757.3	-1.534	-47.82	734.0		0.038	
505	189	16	32	35.8	368.0	0.133	-40.45	355.9		0.051	
506	189	16	33	44.6	886.5	-1.436	-18.97	859.8		0.127	
507	189	16	36	22.8	691.8	-1.431	-30.70	670.3		0.074	
508	189	16	36	37.0	716.6	-1.343	-35.41	694.4		0.062	
509	189	16	36	41.4	396.8	1.078	-21.30	383.9		0.106	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
510	189	16	39	24.8	770.0	0.141	-49.51	746.3		0.036	
511	189	16	39	39.8	999.2	-0.751	-36.94	969.5		0.058	
512	189	16	40	14.2	715.6	-1.336	-48.80	693.5		0.037	
513	189	16	43	8.8	853.2	-1.395	-15.43	827.3		0.191	
514	189	16	43	46.8	1047.5	-0.338	-32.68	1016.6		0.068	
515	189	16	44	24.0	769.3	-1.378	-48.10	745.7		0.038	
516	189	16	45	37.0	637.9	-1.286	-26.53	617.9		0.087	
517	189	16	48	46.4	1085.2	1.015	-21.65	1053.3		0.104	
518	189	16	48	50.2	1002.3	0.728	9.65	972.6		3.428	
519	189	16	51	19.0	837.1	-0.346	-45.66	811.6		0.042	
520	189	16	52	20.0	699.8	1.136	-41.12	678.0		0.049	
521	189	16	54	32.6	1604.9	-1.572	-20.94	1560.9		0.107	
522	189	16	54	47.4	844.8	-1.030	-25.90	819.2		0.089	
523	189	16	55	30.6	1006.7	1.119	-17.10	976.8		0.158	
524	189	16	58	31.2	710.9	-1.310	-49.08	688.9		0.036	
525	189	16	59	15.4	578.9	1.046	-47.28	560.6		0.039	
526	189	16	59	35.2	1091.1	-1.529	-19.77	1059.1		0.116	
527	189	16	59	46.6	816.2	0.263	2.41	791.3		1.489	
528	189	17	2	55.0	636.4	-0.729	-51.87	616.5		0.033	
529	189	17	3	12.8	1453.3	0.643	-16.92	1412.7		0.161	
530	189	17	3	23.0	647.3	1.534	-51.95	627.1		0.033	
531	189	17	3	39.2	681.3	2.645	-45.41	660.1		0.042	
532	189	17	5	23.8	931.2	-1.523	-30.49	903.2		0.074	
533	189	17	5	31.4	1023.1	0.757	-28.69	992.8		0.080	
534	189	17	5	49.2	700.2	0.178	-29.76	678.4		0.076	
535	189	17	6	17.8	913.0	-1.584	-23.65	885.6		0.097	
536	189	17	7	22.6	1456.3	0.556	-34.46	1415.7		0.064	
537	189	17	8	6.0	848.7	-1.527	-39.14	822.9		0.053	
538	189	17	10	41.6	573.9	1.062	-51.32	555.7		0.033	
539	189	17	11	51.6	1430.5	0.652	-27.26	1390.4		0.084	
540	189	17	15	5.0	966.2	-0.782	-38.32	937.4		0.055	
541	189	17	18	30.0	1119.1	-1.070	-40.76	1086.4		0.050	
542	189	17	18	40.4	1101.3	1.272	-36.36	1069.0		0.059	
543	189	17	19	2.2	989.1	0.596	-41.66	959.7		0.048	
544	189	17	20	34.4	1031.3	-1.563	-24.22	1000.8		0.095	
545	189	17	21	6.6	980.1	1.131	-32.61	950.9		0.069	
546	189	17	21	11.4	902.1	1.111	-42.76	874.9		0.046	
547	189	17	21	47.0	1619.1	0.503	-9.03	1574.8		0.399	
548	189	17	22	19.4	565.7	0.355	-50.55	547.8		0.034	
549	189	17	22	44.4	1455.6	0.724	-24.95	1415.0		0.092	
550	189	17	23	1.4	985.7	1.143	-42.37	956.3		0.047	
551	189	17	24	11.2	810.7	-0.740	-40.76	785.9		0.050	
552	189	17	24	34.4	585.4	-1.180	-36.72	566.9		0.059	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
553	189	17	25	37.2	926.7	-1.453	-26.86	898.8		0.085	
554	189	17	27	19.8	774.4	1.386	-46.95	750.7		0.040	
555	189	17	27	23.0	797.4	-1.346	-47.02	773.0		0.039	
556	189	17	30	13.6	1039.5	0.853	-32.61	1008.8		0.069	
557	189	17	30	24.2	824.3	-0.302	-42.42	799.2		0.047	
558	189	17	30	46.6	1823.0	-1.359	-20.50	1774.4		0.109	
559	189	17	30	52.8	1046.8	-1.472	-25.15	1016.0		0.091	
560	189	17	32	1.2	1430.8	0.666	-34.58	1390.7		0.064	
561	189	17	32	9.8	982.4	0.864	-44.50	953.1		0.043	
562	189	17	33	18.4	914.6	-0.226	-46.69	887.1		0.040	
563	189	17	33	21.4	1420.9	-1.194	-25.55	1381.0		0.090	
564	189	17	35	29.2	875.1	-1.040	-19.71	848.6		0.117	
565	189	17	35	48.6	996.1	0.912	-43.27	966.5		0.046	
566	189	17	35	59.0	905.9	1.203	-21.77	878.6		0.104	
567	189	17	38	33.4	932.9	1.185	-38.71	904.9		0.054	
568	189	17	38	47.8	722.0	-1.377	3.29	699.7		1.648	
569	189	17	39	1.4	1734.6	0.519	-31.86	1687.8		0.071	
570	189	17	39	51.6	595.2	0.990	-44.26	576.4		0.044	
571	189	17	40	45.8	950.7	-1.147	-40.55	922.2		0.051	
572	189	17	40	51.0	1021.9	0.587	-10.77	991.7		0.326	
573	189	17	41	9.0	718.2	0.926	-48.17	696.0		0.038	
574	189	17	41	11.8	757.2	-1.453	-37.35	733.9		0.057	
575	189	17	41	19.2	1650.9	0.939	-16.49	1605.9		0.169	
576	189	17	42	33.4	1078.8	0.714	-27.82	1047.1		0.082	
577	189	17	43	8.8	844.2	-2.308	-46.95	818.5		0.040	
578	189	17	43	21.4	819.6	-1.615	-44.26	794.6		0.044	
579	189	17	45	11.0	735.2	-1.308	-23.76	712.5		0.096	
580	189	17	47	14.6	1892.0	-1.052	-33.85	1842.0		0.065	
581	189	17	48	7.6	900.2	-1.217	-38.37	873.1		0.055	
582	189	17	48	35.2	1007.0	1.055	-37.81	977.2		0.056	
583	189	17	48	35.4	909.7	-0.733	-29.73	882.3		0.077	
584	189	17	50	35.8	579.2	-0.785	-45.17	560.9		0.042	
585	189	17	51	57.8	855.6	-1.004	-41.39	829.6		0.049	
586	189	17	52	10.2	829.9	-1.142	-45.17	804.7		0.042	
587	189	17	52	28.6	1063.3	-1.231	-33.81	1032.0		0.065	
588	189	17	54	4.8	496.0	1.760	-35.25	480.1		0.062	
589	189	17	54	42.0	639.5	-1.211	-46.75	619.5		0.040	
590	189	17	54	58.8	1112.8	-1.462	-43.73	1080.2		0.045	
591	189	17	56	29.4	869.2	-1.778	-47.62	842.9		0.039	
592	189	17	56	47.6	1276.8	-1.390	-23.57	1240.3		0.097	
593	189	17	56	56.4	842.6	-0.182	-45.04	817.0		0.043	
594	189	17	57	5.4	935.2	0.750	-28.01	907.2		0.082	
595	189	17	57	8.0	913.7	0.737	-32.53	886.2		0.069	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
596	189	17	57	12.0	643.7	-1.230	-35.88	623.6		0.060	
597	189	17	57	43.4	739.1	-1.668	-46.43	716.3		0.040	
598	189	17	58	15.0	1020.6	0.732	-27.60	990.4		0.083	
599	189	18	0	11.6	1141.0	-1.423	-21.53	1107.8		0.105	
600	189	18	0	37.6	1715.5	1.089	-18.64	1669.1		0.132	
601	189	18	0	39.2	1425.2	-1.650	-22.69	1385.3		0.100	
602	189	18	0	39.2	1425.2	-1.656	-22.69	1385.2		0.100	
603	189	18	2	27.8	909.3	1.196	-18.03	882.0		0.142	
604	189	18	2	36.2	1602.2	-0.837	-17.20	1558.2		0.156	
605	189	18	2	59.0	640.6	-1.703	-43.85	620.6		0.045	
606	189	18	4	10.6	915.9	-1.196	-23.76	888.3		0.096	
607	189	18	4	22.0	1056.2	0.632	-44.32	1025.1		0.044	
608	189	18	5	26.8	1042.1	0.708	-20.43	1011.3		0.109	
609	189	18	6	11.4	851.7	-1.450	-47.48	825.9		0.039	
610	189	18	6	23.2	1586.4	-1.467	-36.14	1542.8		0.060	
611	189	18	6	53.2	677.0	-1.325	-24.19	655.9		0.095	
612	189	18	7	35.8	654.9	-0.983	-37.44	634.5		0.057	
613	189	18	8	1.0	812.6	-0.980	-4.13	787.8		0.701	
614	189	18	8	7.4	456.4	-0.849	-54.56	441.6		0.030	
615	189	18	8	18.4	1626.2	-1.287	-26.86	1581.7		0.085	
616	189	18	8	34.4	1047.9	0.518	-18.16	1016.9		0.139	
617	189	18	8	40.0	744.4	-1.465	-35.08	721.5		0.062	
618	189	18	8	42.0	1053.0	0.832	-18.45	1022.0		0.135	
619	189	18	9	20.6	599.3	1.427	-33.10	580.4		0.067	
620	189	18	10	22.8	850.4	-1.475	-21.40	824.6		0.105	
621	189	18	10	40.2	1225.4	0.545	-21.88	1190.1		0.103	
622	189	18	12	15.8	1023.2	-0.809	-37.95	992.9		0.056	
623	189	18	12	15.8	1023.3	-0.799	-37.95	993.0		0.056	
624	189	18	12	16.0	798.2	-0.216	-41.33	773.8		0.049	
625	189	18	12	16.0	798.3	-0.198	-41.33	773.9		0.049	
626	189	18	12	16.6	1022.6	-0.749	-38.14	992.3		0.055	
627	189	18	12	17.0	798.5	-0.145	-46.17	774.1		0.041	
628	189	18	13	3.6	1476.2	0.626	-35.16	1435.1		0.062	
629	189	18	13	23.2	688.9	0.928	-17.73	667.5		0.147	
630	189	18	13	59.8	565.4	-1.439	-48.17	547.5		0.038	
631	189	18	16	39.9	826.2	0.544	-47.62	801.0		0.039	
632	189	18	16	56.1	609.1	-1.335	-40.55	589.9		0.051	
633	189	18	24	20.7	1448.9	0.661	-36.32	1408.4		0.059	
634	189	18	25	0.7	841.9	0.476	-47.02	816.3		0.039	
635	189	18	28	6.5	1228.6	1.186	-4.38	1193.2		0.681	
636	189	18	28	21.9	1429.0	0.666	-36.50	1389.0		0.059	
637	189	18	28	28.9	979.4	1.138	-26.65	950.2		0.086	
638	189	18	29	17.9	1468.9	0.538	-38.32	1428.0		0.055	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
639	189	18	32	18.5	548.1	-0.333	-49.15	530.7		0.036	
640	189	18	32	36.1	562.9	-1.251	-47.15	545.1		0.039	
641	189	18	33	42.7	708.1	0.552	-40.19	686.2		0.051	
642	189	18	33	53.9	965.1	-3.541	-41.87	936.3		0.048	
643	189	18	35	16.9	652.6	-1.408	-36.23	632.2		0.060	
644	189	18	36	37.9	779.3	-1.465	-22.56	755.4		0.101	
645	189	18	37	37.5	644.5	1.244	0.52	624.3		1.198	
646	189	18	38	8.1	1032.2	0.798	11.50	1001.6		4.243	
647	189	18	38	34.1	591.9	1.644	-50.55	573.2		0.034	
648	189	18	40	25.1	1756.7	0.520	-23.92	1709.4		0.096	
649	189	18	42	3.7	825.3	-0.824	-47.82	800.2		0.038	
650	189	18	42	47.1	1013.9	1.177	-1.63	983.9		0.935	
651	189	18	42	57.7	1760.6	-1.486	-32.99	1713.3		0.068	
652	189	18	44	21.9	1009.5	1.102	-44.86	979.6		0.043	
653	189	18	44	41.5	1208.6	0.788	-28.59	1173.7		0.080	
654	189	18	45	19.1	1034.4	0.815	-29.52	1003.9		0.077	
655	189	18	45	31.7	641.4	0.802	-38.28	621.3		0.055	
656	189	18	48	20.9	1061.1	-1.500	-38.95	1029.8		0.054	
657	189	18	48	42.7	536.2	-1.360	-18.40	519.2		0.136	
658	189	18	49	27.3	1034.2	-1.525	-37.67	1003.6		0.056	
659	189	18	50	44.1	1005.7	-0.798	-38.80	975.9		0.054	
660	189	18	51	55.7	1012.7	1.161	-38.90	982.7		0.054	
661	189	18	52	38.7	1135.3	-1.181	-29.46	1102.2		0.077	
662	189	18	53	51.9	1147.1	-1.845	-32.30	1113.8		0.069	
663	189	18	54	41.3	499.1	0.070	-35.84	483.1		0.061	
664	189	18	58	29.1	1003.4	0.763	-25.90	973.7		0.089	
665	189	18	58	58.1	417.0	1.379	-29.83	403.5		0.076	
666	189	19	1	18.3	1192.2	-0.927	-28.96	1157.7		0.079	
667	189	19	2	50.9	1433.9	-0.701	-35.58	1393.7		0.061	
668	189	19	3	23.3	819.4	0.087	-26.53	794.4		0.087	
669	189	19	3	54.3	1025.6	0.745	-44.56	995.2		0.043	
670	189	19	4	14.3	1175.8	-0.364	-32.19	1141.7		0.070	
671	189	19	4	27.9	1003.4	0.703	-28.11	973.6		0.081	
672	189	19	5	47.9	1615.9	-1.613	-34.62	1571.7		0.063	
673	189	19	6	4.1	1734.1	1.078	-28.66	1687.3		0.080	
674	189	19	6	36.9	812.4	0.281	0.99	787.6		1.265	
675	189	19	7	20.1	685.0	-1.352	-47.89	663.7		0.038	
676	189	19	8	16.3	1098.2	-1.213	-39.09	1066.0		0.053	
677	189	19	8	23.5	1437.4	0.648	-28.53	1397.1		0.080	
678	189	19	9	24.9	1020.8	0.774	-45.17	990.6		0.042	
679	189	19	10	9.3	995.1	1.138	1.86	965.5		1.397	
680	189	19	10	28.3	1469.1	0.600	-2.22	1428.1		0.874	
681	189	19	10	41.3	1444.7	-1.587	-34.58	1404.3		0.064	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
682	189	19	11	13.9	1057.1	1.256	-32.49	1025.9		0.069	
683	189	19	12	35.9	807.3	0.247	-39.44	782.7		0.053	
684	189	19	13	24.5	1058.3	1.299	-23.35	1027.2		0.098	
685	189	19	14	6.9	996.7	1.171	5.13	967.1		2.037	
686	189	19	15	9.5	1289.0	0.509	-32.87	1252.2		0.068	
687	189	19	15	13.3	811.9	-0.692	-25.93	787.2		0.089	
688	189	19	15	15.1	1292.3	0.690	-21.55	1255.5		0.105	
689	189	19	15	21.1	1297.0	0.865	-31.09	1260.0		0.073	
690	189	19	15	21.7	558.8	-1.211	-21.53	541.0		0.105	
691	189	19	15	52.9	764.4	-1.455	-29.73	740.9		0.077	
692	189	19	16	4.1	1009.7	0.728	-5.16	979.7		0.623	
693	189	19	16	49.1	846.0	-1.484	-42.26	820.4		0.047	
694	189	19	16	59.1	592.0	-1.228	-52.11	573.3		0.032	
695	189	19	16	59.9	1416.2	-0.749	-36.63	1376.4		0.059	
696	189	19	17	49.3	2154.9	-1.214	-19.72	2099.7		0.117	
697	189	19	19	4.3	756.1	-1.297	-27.38	732.9		0.084	
698	189	19	19	27.7	701.7	-1.124	-49.44	679.9		0.036	
699	189	19	20	46.9	1501.1	0.684	-33.03	1459.4		0.067	
700	189	19	21	31.5	684.4	-1.420	-43.55	663.1		0.045	
701	189	19	21	38.5	1217.2	0.661	-33.42	1182.1		0.066	
702	189	19	23	16.9	759.7	-1.268	-28.89	736.3		0.079	
703	189	19	24	59.9	518.7	-1.301	-40.91	502.1		0.050	
704	189	19	26	35.1	922.9	1.507	-36.01	895.2		0.060	
705	189	19	27	32.1	926.5	-1.126	-41.02	898.7		0.050	
706	189	19	27	49.1	1065.9	1.405	-43.09	1034.5		0.046	
707	189	19	28	2.1	943.7	0.981	-32.19	915.4		0.070	
708	189	19	28	34.7	1473.1	0.580	-10.30	1432.0		0.345	
709	189	19	30	5.3	641.4	1.309	-48.44	621.3		0.037	
710	189	19	31	28.7	990.1	1.147	-39.99	960.6		0.052	
711	189	19	31	53.7	1633.3	-1.472	-28.08	1588.7		0.082	
712	189	19	32	12.1	1056.7	0.939	-43.96	1025.5		0.044	
713	189	19	32	45.5	689.8	-1.350	-23.62	668.4		0.097	
714	189	19	34	14.9	843.2	-1.504	-47.55	817.6		0.039	
715	189	19	34	25.9	1225.2	1.291	-26.14	1189.9		0.088	
716	189	19	37	25.1	917.3	-1.113	-15.64	889.7		0.187	
717	189	19	37	49.5	986.3	-1.535	-42.64	956.9		0.047	
718	189	19	39	36.7	823.3	-1.109	-39.29	798.3		0.053	
719	189	19	39	39.7	2018.4	-0.873	-30.04	1965.8		0.076	
720	189	19	40	46.7	847.1	-0.955	-40.86	821.4		0.050	
721	189	19	42	53.7	687.7	-1.141	-21.53	666.3		0.105	
722	189	19	44	11.1	1537.4	0.585	-24.67	1494.9		0.093	
723	189	19	44	59.9	1463.9	0.629	-24.36	1423.0		0.094	
724	189	19	47	34.5	1032.9	1.125	-2.94	1002.3		0.804	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
725	189	19	47	44.3	833.2	-1.017	-11.57	807.8		0.298	
726	189	19	49	4.3	896.2	1.034	-29.63	869.2		0.077	
727	189	19	49	31.3	943.1	2.341	-45.04	914.9		0.043	
728	189	19	49	38.3	755.8	-0.725	-43.85	732.5		0.045	
729	189	19	51	10.7	648.5	1.100	-50.93	628.3		0.034	
730	189	19	51	48.1	1246.4	-1.028	-23.84	1210.6		0.096	
731	189	19	54	40.3	1016.6	-1.487	-44.80	986.4		0.043	
732	189	19	55	18.5	1301.0	1.259	-37.76	1263.9		0.056	
733	189	19	55	25.1	610.7	0.785	-17.59	591.5		0.149	
734	189	19	58	14.1	607.9	0.912	-52.28	588.8		0.032	
735	189	19	58	33.7	646.0	-1.394	-23.54	625.8		0.097	
736	189	19	58	43.7	1117.7	-1.397	-38.42	1085.0		0.055	
737	189	20	2	21.5	1008.0	-1.741	-32.87	978.1		0.068	
738	189	20	4	2.5	1760.8	1.085	-30.66	1713.5		0.074	
739	189	20	5	8.3	868.3	-0.326	-26.32	842.0		0.087	
740	189	20	5	22.3	1045.3	0.586	-39.19	1014.4		0.053	
741	189	20	6	53.1	1490.7	0.515	-26.44	1449.2		0.087	
742	189	20	7	9.1	581.6	1.255	-22.44	563.3		0.101	
743	189	20	8	41.7	1106.4	-1.086	-42.15	1074.0		0.048	
744	189	20	10	23.9	649.5	1.057	-48.80	629.2		0.037	
745	189	20	10	37.7	2181.1	-1.281	-23.11	2125.4		0.099	
746	189	20	12	59.1	1242.5	1.290	-37.86	1206.8		0.056	
747	189	20	13	2.1	908.1	-1.467	-25.84	880.8		0.089	
748	189	20	13	5.3	1251.0	1.481	-4.60	1215.1		0.664	
749	189	20	13	11.7	1261.1	1.677	-37.62	1225.0		0.057	
750	189	20	16	23.5	923.5	1.500	-28.40	895.8		0.081	
751	189	20	17	34.3	893.2	-1.504	-42.81	866.2		0.046	
752	189	20	18	1.3	1080.7	-1.427	-16.44	1049.0		0.170	
753	189	20	18	4.9	1044.1	0.947	-25.23	1013.3		0.091	
754	189	20	18	9.1	1048.4	1.119	-15.78	1017.5		0.184	
755	189	20	18	23.7	801.8	-1.400	-26.47	777.3		0.087	
756	189	20	18	56.3	772.4	0.827	-49.30	748.7		0.036	
757	189	20	19	13.7	900.1	1.407	-5.85	873.0		0.576	
758	189	20	20	0.5	841.8	0.688	-45.79	816.2		0.041	
759	189	20	20	5.1	844.9	0.971	-46.11	819.2		0.041	
760	189	20	20	8.9	1464.5	0.572	-19.55	1423.6		0.119	
761	189	20	20	14.3	1106.4	-1.183	-17.88	1074.0		0.144	
762	189	20	20	32.3	458.7	-0.557	-54.73	443.9		0.029	
763	189	20	21	26.7	1074.0	-1.532	-22.31	1042.4		0.102	
764	189	20	21	27.1	817.9	0.727	-26.17	793.0		0.088	
765	189	20	21	30.5	820.6	0.924	-34.91	795.6		0.063	
766	189	20	23	4.5	1334.6	-1.450	-39.64	1296.7		0.052	
767	189	20	23	38.5	807.8	1.403	-41.02	783.2		0.050	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
768	189	20	23	47.5	602.0	1.150	-52.28	583.1		0.032	
769	189	20	23	49.7	1544.3	1.078	-18.80	1501.6		0.130	
770	189	20	26	38.7	886.9	-1.550	-41.60	860.1		0.049	
771	189	20	29	27.1	945.6	1.206	-33.53	917.3		0.066	
772	189	20	29	28.5	1454.8	-1.468	-28.66	1414.2		0.080	
773	189	20	30	37.1	1213.1	-1.744	-29.12	1178.1		0.078	
774	189	20	32	41.5	776.4	0.657	-48.37	752.6		0.037	
775	189	20	32	56.7	936.4	1.175	-30.80	908.4		0.073	
776	189	20	33	28.5	1640.0	-1.299	-13.28	1595.2		0.245	
777	189	20	33	38.5	755.5	0.890	-22.28	732.3		0.102	
778	189	20	35	14.1	1046.7	1.149	-4.43	1015.8		0.678	
779	189	20	35	23.7	988.7	-0.262	-43.55	959.2		0.045	
780	189	20	35	35.1	1665.3	-1.235	-21.65	1620.0		0.104	
781	189	20	37	11.1	1032.1	1.158	-0.19	1001.6		1.104	
782	189	20	37	17.7	1680.9	-1.323	-21.43	1635.3		0.105	
783	189	20	38	13.3	1025.8	0.844	-40.91	995.4		0.050	
784	189	20	38	19.3	665.6	0.849	-27.57	644.8		0.083	
785	189	20	38	23.7	1027.7	0.637	-38.42	997.3		0.055	
786	189	20	40	29.1	827.3	-1.062	-45.54	802.1		0.042	
787	189	20	44	0.9	710.9	-1.388	3.99	688.9		1.786	
788	189	20	46	38.9	1148.3	-1.491	-28.56	1114.9		0.080	
789	189	20	48	15.5	893.0	0.260	-15.98	866.1		0.179	
790	189	20	48	28.5	1721.2	-1.442	-26.11	1674.7		0.088	
791	189	20	48	38.1	736.2	-1.420	-33.73	713.5		0.066	
792	189	20	49	21.1	1904.5	-1.417	-32.23	1854.2		0.070	
793	189	20	53	6.1	594.8	1.426	2.08	576.0		1.433	
794	189	20	54	54.1	653.5	0.752	-48.24	633.1		0.038	
795	189	20	55	1.9	1438.2	-1.522	-38.90	1397.9		0.054	
796	189	20	56	0.1	1250.7	-1.476	-14.70	1214.8		0.208	
797	189	20	56	13.5	1044.9	0.632	-20.84	1014.1		0.108	
798	189	20	56	33.7	1627.4	-1.571	-17.50	1583.0		0.151	
799	189	20	56	47.3	755.6	-1.211	-41.87	732.4		0.048	
800	189	20	59	47.1	809.5	0.252	-26.14	784.8		0.088	
801	189	20	59	50.1	811.5	0.485	-33.22	786.8		0.067	
802	189	20	59	52.5	1027.5	1.210	-22.96	997.1		0.099	
803	189	21	1	54.7	693.3	-1.432	-36.50	671.7		0.059	
804	189	21	6	8.1	988.0	1.147	-40.50	958.6		0.051	
805	189	21	7	36.7	1470.1	0.580	-7.51	1429.2		0.475	
806	189	21	9	23.9	1875.6	-1.458	-27.89	1825.9		0.082	
807	189	21	13	16.3	1173.9	-1.610	-35.76	1139.8		0.061	
808	189	21	13	49.5	757.0	-1.416	-11.81	733.7		0.290	
809	189	21	14	45.5	1012.7	-0.912	-42.53	982.6		0.047	
810	189	21	15	12.3	1405.5	-1.465	-36.06	1366.0		0.060	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
811	189	21	16	12.7	809.1	0.109	-29.22	784.4		0.078	
812	189	21	16	48.3	966.8	-1.243	-25.70	938.0		0.089	
813	189	21	17	14.1	1039.4	1.073	-24.33	1008.7		0.094	
814	189	21	17	25.5	1278.3	-0.570	-36.90	1241.7		0.058	
815	189	21	18	34.7	1667.7	-1.560	-33.10	1622.3		0.067	
816	189	21	18	40.9	997.4	-0.781	-39.69	967.8		0.052	
817	189	21	19	59.7	1212.3	0.672	-29.39	1177.3		0.078	
818	189	21	21	17.1	1014.5	1.153	3.20	984.4		1.631	
819	189	21	23	57.9	833.4	1.240	-38.95	808.0		0.054	
820	189	21	25	57.5	1499.4	1.254	-34.34	1457.8		0.064	
821	189	21	26	9.5	787.4	-1.454	-16.08	763.3		0.177	
822	189	21	27	35.3	1144.7	-0.415	-30.73	1111.3		0.074	
823	189	21	27	38.3	950.6	-1.614	-34.66	922.2		0.063	
824	189	21	27	41.7	1142.8	-0.163	-30.21	1109.6		0.075	
825	189	21	28	10.3	653.8	-1.463	-49.51	633.3		0.036	
826	189	21	28	11.3	1486.0	-1.434	-37.26	1444.6		0.057	
827	189	21	28	11.3	1485.9	-1.419	-37.26	1444.6		0.057	
828	189	21	28	45.3	1026.1	0.742	-9.73	995.7		0.368	
829	189	21	29	27.7	1144.9	-1.529	-12.90	1111.6		0.256	
830	189	21	30	28.1	1044.5	0.715	-0.06	1013.7		1.121	
831	189	21	30	59.7	988.8	0.682	-35.12	959.4		0.062	
832	189	21	32	5.5	1416.6	-1.502	-19.41	1376.9		0.121	
833	189	21	32	31.5	1168.9	-0.899	-30.38	1134.9		0.075	
834	189	21	33	39.5	1562.5	0.525	-28.53	1519.4		0.080	
835	189	21	34	2.9	1005.2	0.549	-45.79	975.3		0.041	
836	189	21	37	1.9	742.4	-1.111	-45.41	719.5		0.042	
837	189	21	38	14.1	1297.3	1.699	-16.52	1260.3		0.169	
838	189	21	38	39.3	2282.8	1.868	-17.27	2225.2		0.155	
839	189	21	42	28.1	1069.1	0.265	-39.89	1037.7		0.052	
840	189	21	43	49.9	831.2	-1.459	-44.68	805.9		0.043	
841	189	21	45	26.1	1007.7	0.853	-34.21	977.8		0.064	
842	189	21	49	21.5	711.4	-1.194	-47.82	689.4		0.038	
843	189	21	50	41.5	1118.8	-1.543	-37.44	1086.1		0.057	
844	189	21	51	2.1	1481.2	0.738	-30.98	1440.0		0.073	
845	189	21	51	55.1	1114.8	-1.179	-34.38	1082.2		0.064	
846	189	21	52	46.5	1006.2	1.175	-41.71	976.4		0.048	
847	189	21	52	52.7	702.8	-1.238	-37.17	681.0		0.058	
848	189	21	52	54.1	1043.4	1.117	-37.49	1012.6		0.057	
849	189	21	54	23.5	1393.8	-1.711	-19.69	1354.6		0.117	
850	189	21	54	34.1	1008.3	0.231	-41.28	978.3		0.049	
851	189	21	58	39.1	1024.2	1.018	-43.38	993.9		0.045	
852	189	21	59	26.7	776.1	1.405	-42.09	752.3		0.048	
853	189	22	0	24.1	1154.1	-1.226	-21.45	1120.5		0.105	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
854	189	22	1	29.3	1200.2	0.410	-24.08	1165.5		0.095	
855	189	22	2	31.9	1034.0	1.008	-41.60	1003.4		0.049	
856	189	22	4	15.7	1148.9	0.302	-11.86	1115.4		0.288	
857	189	22	7	48.5	1003.5	0.712	-37.81	973.7		0.056	
858	189	22	8	3.3	1552.1	1.120	6.47	1509.2		2.377	
859	189	22	8	38.9	748.1	-1.426	-47.28	725.0		0.039	
860	189	22	8	55.9	1668.4	0.590	-19.86	1623.0		0.115	
861	189	22	11	12.3	1287.7	-0.983	-24.64	1250.9		0.093	
862	189	22	12	45.3	1510.8	-1.409	-37.62	1468.9		0.057	
863	189	22	13	13.5	1543.1	-1.420	-31.42	1500.4		0.072	
864	189	22	14	46.5	773.9	-0.979	-20.36	750.1		0.110	
865	189	22	19	46.7	1028.6	1.117	-44.14	998.1		0.044	
866	189	22	20	28.5	761.8	-1.322	-38.09	738.3		0.056	
867	189	22	20	44.9	1436.4	0.887	-19.29	1396.1		0.123	
868	189	22	22	57.3	1054.4	1.449	-41.23	1023.3		0.049	
869	189	22	25	6.5	822.2	0.770	-39.74	797.2		0.052	
870	189	22	25	18.5	938.7	1.267	-39.79	910.6		0.052	
871	189	22	30	16.5	762.8	1.120	-49.73	739.3		0.036	
872	189	22	31	59.7	1539.4	-1.440	-4.94	1496.8		0.639	
873	189	22	32	18.7	1594.9	-1.424	-11.31	1551.2		0.307	
874	189	22	33	10.5	1029.7	1.125	-2.10	999.2		0.886	
875	189	22	33	39.9	817.3	-0.893	-19.12	792.3		0.125	
876	189	22	34	9.5	1050.6	1.209	-41.71	1019.7		0.048	
877	189	22	34	19.3	812.5	0.881	-35.46	787.7		0.061	
878	189	22	34	49.9	1024.2	0.875	-35.29	993.9		0.062	
879	189	22	35	50.7	765.3	-1.622	-30.42	741.8		0.075	
880	189	22	36	4.5	1017.6	-0.207	-40.76	987.4		0.050	
881	189	22	36	26.7	1023.3	0.772	-36.99	993.0		0.058	
882	189	22	37	4.1	748.3	0.930	-35.29	725.2		0.062	
883	189	22	38	11.9	646.7	1.307	-32.45	626.5		0.069	
884	189	22	39	53.1	649.7	-1.310	-40.29	629.4		0.051	
885	189	22	41	3.7	904.9	1.019	4.75	877.7		1.950	
886	189	22	42	32.9	1050.4	1.087	-42.98	1019.4		0.046	
887	189	22	43	12.3	991.3	1.234	-2.24	961.9		0.872	
888	189	22	43	20.3	974.1	0.735	-9.65	945.1		0.371	
889	189	22	45	7.5	1031.3	-1.516	-32.27	1000.8		0.069	
890	189	22	46	38.1	1145.1	-1.462	-20.15	1111.8		0.111	
891	189	22	49	3.5	1799.5	-1.655	-13.24	1751.3		0.246	
892	189	22	50	13.1	910.7	1.124	-20.53	883.4		0.109	
893	189	22	50	42.5	932.7	0.990	-10.28	904.7		0.346	
894	189	22	52	5.3	1154.0	-1.383	-16.09	1120.4		0.177	
895	189	22	54	12.5	924.5	1.375	-40.81	896.8		0.050	
896	189	22	56	14.9	1773.3	-1.437	-24.95	1725.7		0.092	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
897	189	22	57	15.9	1463.6	-1.493	-23.73	1422.7		0.096	
898	189	22	58	16.3	1092.0	-1.218	-14.77	1060.0		0.206	
899	189	22	59	44.1	637.7	0.891	-43.79	617.8		0.045	
900	189	23	0	47.3	571.2	0.947	-30.66	553.2		0.074	
901	189	23	1	0.9	610.4	0.931	-45.35	591.2		0.042	
902	189	23	1	11.1	633.9	0.895	-35.37	614.0		0.062	
903	189	23	2	19.5	1176.2	-1.071	-18.29	1142.1		0.137	
904	189	23	2	42.7	574.5	0.909	-49.30	556.3		0.036	
905	189	23	2	54.9	855.5	-1.594	-35.80	829.5		0.061	
906	189	23	2	57.5	701.6	-1.131	-31.63	679.9		0.071	
907	189	23	3	42.1	1057.6	-1.106	-6.63	1026.4		0.526	
908	189	23	3	51.9	748.5	0.809	-47.55	725.4		0.039	
909	189	23	5	59.5	1415.0	-1.647	-35.63	1375.2		0.061	
910	189	23	6	3.7	915.8	-1.491	-18.70	888.3		0.131	
911	189	23	6	24.7	584.2	0.181	-48.73	565.8		0.037	
912	189	23	7	11.3	1557.9	-1.157	-29.63	1514.9		0.077	
913	189	23	8	1.5	447.6	1.246	-49.51	433.1		0.036	
914	189	23	9	23.7	1053.8	-1.111	-5.34	1022.7		0.610	
915	189	23	9	49.7	1143.8	-1.210	-32.76	1110.5		0.068	
916	189	23	14	13.7	669.9	-1.215	-41.12	649.0		0.049	
917	189	23	18	4.1	990.8	1.180	-45.48	961.3		0.042	
918	189	23	21	6.9	1445.9	-0.771	-36.76	1405.5		0.058	
919	189	23	22	50.1	1051.3	1.466	-34.87	1020.3		0.063	
920	189	23	23	25.7	1071.0	1.140	-20.74	1039.5		0.108	
921	189	23	23	30.1	1303.3	0.520	-39.74	1266.2		0.052	
922	189	23	24	8.1	932.3	1.495	-32.08	904.4		0.070	
923	189	23	24	41.3	858.2	-1.390	-9.29	832.2		0.387	
924	189	23	25	45.1	712.9	-1.574	-22.36	690.8		0.102	
925	189	23	26	26.7	982.9	-1.580	-10.86	953.7		0.323	
926	189	23	27	6.9	716.5	-0.941	-31.27	694.3		0.072	
927	189	23	28	26.9	1029.4	-0.473	-43.55	998.9		0.045	
928	189	23	31	18.1	914.0	1.198	-41.28	886.5		0.049	
929	189	23	34	15.9	1485.7	0.177	-35.71	1444.3		0.061	
930	189	23	35	31.9	981.8	1.116	-4.37	952.6		0.682	
931	189	23	36	43.9	959.8	1.236	-44.38	931.2		0.044	
932	189	23	36	55.5	661.3	1.397	-16.01	640.7		0.179	
933	189	23	37	10.3	689.9	2.434	-47.55	668.5		0.039	
934	189	23	38	3.9	1315.2	-1.383	-33.42	1277.7		0.066	
935	189	23	38	7.3	1484.8	-1.572	-30.98	1443.4		0.073	
936	189	23	39	20.1	1242.8	-1.507	-26.92	1207.1		0.085	
937	189	23	39	29.5	713.0	0.731	-40.19	691.0		0.051	
938	189	23	40	11.7	1122.3	-1.165	-23.35	1089.6		0.098	
939	189	23	45	5.1	1438.5	0.523	-26.20	1398.3		0.088	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
940	189	23	45	24.1	957.7	-0.389	-12.91	929.1		0.255	
941	189	23	47	31.1	1255.5	-1.530	-38.90	1219.5		0.054	
942	189	23	51	30.1	865.2	0.819	-33.53	839.0		0.066	
943	189	23	52	19.7	632.9	-1.200	-23.51	613.1		0.097	
944	189	23	53	10.9	1540.7	-1.507	-23.92	1498.2		0.096	
945	189	23	53	31.3	1017.9	1.296	-40.04	987.8		0.052	
946	189	23	53	52.9	567.2	-0.943	-46.89	549.2		0.040	
947	189	23	54	7.5	1149.8	-0.969	-23.68	1116.3		0.097	
948	189	23	54	33.7	1020.8	0.145	-44.02	990.5		0.044	
949	189	23	55	13.1	1438.4	-1.060	-24.47	1398.1		0.094	
950	189	23	56	45.7	657.6	-0.857	-50.10	637.1		0.035	
951	190	0	1	22.9	1525.2	-1.531	-19.04	1483.0		0.126	
952	190	0	8	22.7	1150.3	1.902	-36.19	1116.8		0.060	
953	190	0	9	7.3	1031.6	1.017	-26.35	1001.0		0.087	
954	190	0	9	27.7	1003.6	0.270	-45.10	973.8		0.042	
955	190	0	10	25.5	1451.3	0.635	-17.19	1410.7		0.156	
956	190	0	11	24.7	1305.4	0.811	-39.94	1268.2		0.052	
957	190	0	12	5.1	1053.9	1.115	-42.20	1022.9		0.047	
958	190	0	12	31.1	598.4	1.603	-51.48	579.6		0.033	
959	190	0	12	57.9	529.9	1.592	-29.52	513.0		0.077	
960	190	0	14	21.3	1440.1	0.528	-30.42	1399.8		0.075	
961	190	0	14	22.5	708.1	1.287	-29.22	686.1		0.078	
962	190	0	14	29.7	1445.5	0.768	-31.63	1405.0		0.071	
963	190	0	14	35.5	819.0	-1.288	-45.04	794.1		0.043	
964	190	0	14	51.7	1474.2	0.674	-31.38	1433.1		0.072	
965	190	0	15	4.9	869.8	0.685	-45.17	843.5		0.042	
966	190	0	15	31.7	729.2	-1.318	-45.66	706.7		0.042	
967	190	0	17	10.5	1012.7	1.139	7.25	982.7		2.598	
968	190	0	18	7.9	613.7	-0.472	-43.50	594.4		0.045	
969	190	0	23	2.7	1368.8	-0.485	-29.59	1330.1		0.077	
970	190	0	23	17.1	983.7	0.784	-37.90	954.4		0.056	
971	190	0	23	23.7	1064.4	-1.167	-20.64	1033.1		0.108	
972	190	0	23	29.5	1041.0	1.075	-41.02	1010.2		0.050	
973	190	0	23	42.1	1017.9	0.718	-2.20	987.7		0.876	
974	190	0	24	50.9	1282.2	-1.372	-36.50	1245.6		0.059	
975	190	0	28	26.7	849.5	-1.521	-46.62	823.7		0.040	
976	190	0	28	56.9	1603.3	-1.585	-14.91	1559.3		0.203	
977	190	0	32	14.9	652.0	-0.770	-36.14	631.6		0.060	
978	190	0	32	41.1	577.6	0.969	-6.87	559.4		0.511	
979	190	0	34	48.1	1045.0	1.020	-30.88	1014.2		0.073	
980	190	0	35	10.9	1465.0	0.597	-8.49	1424.1		0.425	
981	190	0	37	55.9	812.0	0.716	-1.40	787.2		0.960	
982	190	0	42	19.5	1450.6	0.660	-31.23	1410.0		0.072	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
983	190	0	42	57.3	1478.1	0.477	-19.29	1437.0		0.123	
984	190	0	43	2.9	1193.1	-0.205	-7.16	1158.6		0.495	
985	190	0	44	13.5	1038.0	1.465	-44.56	1007.3		0.043	
986	190	0	44	28.3	992.7	1.091	-28.30	963.2		0.081	
987	190	0	44	34.7	742.0	-1.446	-36.81	719.1		0.058	
988	190	0	46	2.7	688.4	1.392	-45.79	667.0		0.041	
989	190	0	47	26.7	1077.3	1.147	-28.66	1045.7		0.080	
990	190	0	47	58.5	808.0	-1.431	-44.62	783.3		0.043	
991	190	0	50	5.5	1051.0	-1.176	-16.34	1020.0		0.172	
992	190	0	51	6.1	1461.0	0.465	-12.72	1420.2		0.261	
993	190	0	51	47.7	982.0	0.262	-44.08	952.8		0.044	
994	190	0	53	3.3	509.1	0.260	-28.01	492.9		0.082	
995	190	0	53	36.9	507.8	0.201	-18.78	491.5		0.130	
996	190	0	53	56.3	1564.0	-1.237	-35.76	1520.9		0.061	
997	190	0	54	21.3	1424.3	-1.486	-29.66	1384.3		0.077	
998	190	0	54	41.5	1137.4	-1.149	-7.61	1104.2		0.470	
999	190	0	54	54.5	1541.2	-1.510	-31.38	1498.6		0.072	
1000	190	0	55	56.9	1557.8	0.462	-32.57	1514.8		0.069	
1001	190	0	56	13.5	1255.7	-1.194	-27.95	1219.7		0.082	
1002	190	1	0	50.7	569.6	1.454	-49.44	551.5		0.036	
1003	190	1	3	2.3	947.1	-1.393	1.14	918.7		1.287	
1004	190	1	3	59.5	890.6	0.736	-41.44	863.7		0.049	
1005	190	1	4	17.9	1557.4	-0.609	9.16	1514.4		3.238	
1006	190	1	5	22.1	569.6	-1.449	-40.55	551.6		0.051	
1007	190	1	5	54.3	1022.4	1.159	1.11	992.2		1.282	
1008	190	1	6	45.9	1487.1	0.760	-33.89	1445.7		0.065	
1009	190	1	8	1.9	1076.2	-1.478	-41.93	1044.6		0.048	
1010	190	1	9	34.1	1198.6	-0.997	-37.76	1164.0		0.056	
1011	190	1	10	8.3	1047.2	1.158	-22.96	1016.3		0.099	
1012	190	1	10	27.9	1347.3	-1.552	-38.90	1309.2		0.054	
1013	190	1	10	55.9	1465.2	0.609	3.80	1424.3		1.748	
1014	190	1	13	10.1	1199.1	0.795	-34.50	1164.5		0.064	
1015	190	1	13	28.1	1062.5	1.403	-43.38	1031.2		0.045	
1016	190	1	14	13.1	1079.1	1.223	-32.95	1047.4		0.068	
1017	190	1	14	19.3	1435.5	0.844	-33.03	1395.3		0.067	
1018	190	1	14	41.5	797.3	0.926	-43.50	772.9		0.045	
1019	190	1	15	28.1	1047.1	0.278	-18.80	1016.2		0.130	
1020	190	1	17	6.7	1093.7	-1.191	-17.34	1061.6		0.153	
1021	190	1	18	13.1	1465.4	0.611	-7.22	1424.5		0.491	
1022	190	1	19	42.5	830.5	0.973	-23.73	805.2		0.096	
1023	190	1	20	29.3	869.1	-1.284	-27.60	842.8		0.083	
1024	190	1	21	48.5	416.7	1.093	-43.96	403.1		0.044	
1025	190	1	24	18.3	1464.4	0.622	-7.78	1423.5		0.461	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1026	190	1	26	13.1	814.7	-1.361	-20.22	789.9		0.110	
1027	190	1	27	40.5	595.7	0.671	-31.63	576.9		0.071	
1028	190	1	28	59.1	1470.6	1.152	-5.60	1429.6		0.592	
1029	190	1	29	28.3	1024.4	1.069	-33.22	994.1		0.067	
1030	190	1	31	51.5	1037.1	-1.166	-42.64	1006.5		0.047	
1031	190	1	33	31.3	821.6	0.572	-28.30	796.6		0.081	
1032	190	1	34	24.1	660.8	1.533	-47.82	640.1		0.038	
1033	190	1	35	19.7	472.2	1.586	-50.10	457.0		0.035	
1034	190	1	40	0.7	1006.4	1.091	-44.74	976.6		0.043	
1035	190	1	44	20.5	1000.8	1.115	-18.37	971.1		0.136	
1036	190	1	44	41.7	1042.3	0.690	0.98	1011.5		1.263	
1037	190	1	44	58.7	1471.9	1.157	-21.62	1430.9		0.104	
1038	190	1	46	36.3	731.7	1.371	-18.61	709.2		0.132	
1039	190	1	48	35.9	1552.7	-1.421	-34.99	1509.8		0.063	
1040	190	1	49	54.3	924.7	0.967	-27.51	896.9		0.083	
1041	190	1	53	0.9	998.2	1.111	-25.70	968.6		0.089	
1042	190	1	53	17.7	1049.5	0.179	-31.82	1018.6		0.071	
1043	190	1	55	32.3	725.1	-1.719	-48.58	702.7		0.037	
1044	190	1	56	26.5	1556.8	1.053	-28.56	1513.9		0.080	
1045	190	1	56	31.9	765.3	-1.325	-38.80	741.8		0.054	
1046	190	1	57	8.9	1870.8	-1.240	-14.48	1821.2		0.213	
1047	190	1	59	59.1	1462.4	1.119	-12.65	1421.6		0.263	
1048	190	2	0	49.7	833.3	-1.383	-4.47	808.0		0.674	
1049	190	2	3	19.9	1017.8	1.176	4.46	987.6		1.885	
1050	190	2	4	35.3	1234.1	-1.621	-31.23	1198.6		0.072	
1051	190	2	6	36.7	1545.8	1.303	-33.85	1503.1		0.065	
1052	190	2	7	2.1	1472.9	1.151	-14.33	1431.9		0.217	
1053	190	2	7	25.7	1001.0	-1.558	-45.48	971.2		0.042	
1054	190	2	8	28.7	640.9	0.774	-40.97	620.8		0.050	
1055	190	2	10	20.1	1443.0	0.486	-24.95	1402.6		0.092	
1056	190	2	11	36.3	1538.5	1.163	-8.46	1496.0		0.426	
1057	190	2	11	40.7	1079.8	-1.546	-23.27	1048.1		0.098	
1058	190	2	11	43.7	1547.8	1.353	-31.13	1505.1		0.073	
1059	190	2	13	53.7	867.4	1.198	-36.63	841.1		0.059	
1060	190	2	16	34.5	754.1	-1.583	-3.43	730.9		0.761	
1061	190	2	18	11.7	812.9	-0.681	-40.55	788.1		0.051	
1062	190	2	19	1.1	797.5	-1.465	-43.67	773.1		0.045	
1063	190	2	20	43.3	1026.4	1.231	-42.09	996.1		0.048	
1064	190	2	25	28.5	892.5	1.049	2.94	865.6		1.584	
1065	190	2	25	32.9	1870.1	1.416	-31.23	1820.5		0.072	
1066	190	2	26	6.5	1056.8	1.208	-13.07	1025.6		0.251	
1067	190	2	26	22.1	665.3	1.336	-40.65	644.5		0.050	
1068	190	2	27	19.7	1481.7	1.075	-36.63	1440.4		0.059	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1069	190	2	27	21.1	696.8	-0.956	-45.35	675.2		0.042	
1070	190	2	27	27.7	1490.5	1.268	-36.58	1449.1		0.059	
1071	190	2	30	38.9	985.5	0.910	-25.64	956.2		0.090	
1072	190	2	31	20.3	657.5	1.070	-30.17	637.0		0.075	
1073	190	2	32	23.5	830.9	0.824	-47.35	805.6		0.039	
1074	190	2	34	2.3	1472.1	1.141	-3.91	1431.0		0.720	
1075	190	2	34	29.1	947.7	1.490	-19.62	919.4		0.118	
1076	190	2	35	48.9	1497.6	-1.527	-36.67	1456.0		0.059	
1077	190	2	37	8.9	1551.9	-1.422	-20.81	1509.0		0.108	
1078	190	2	38	6.3	678.5	-1.280	-34.46	657.4		0.064	
1079	190	2	38	18.1	1826.6	0.696	-25.09	1777.9		0.091	
1080	190	2	38	27.7	710.3	-1.093	-31.71	688.3		0.071	
1081	190	2	38	45.5	702.7	0.204	-48.87	680.9		0.037	
1082	190	2	38	47.3	839.5	-1.112	-41.76	814.0		0.048	
1083	190	2	39	7.5	946.2	-1.409	-20.06	917.8		0.112	
1084	190	2	39	46.9	964.0	-0.808	-44.38	935.2		0.044	
1085	190	2	41	35.9	814.5	0.707	-4.09	789.7		0.704	
1086	190	2	43	14.5	784.4	0.706	1.66	760.3		1.366	
1087	190	2	44	55.9	1531.6	1.137	-6.54	1489.2		0.532	
1088	190	2	45	11.1	998.9	0.736	-43.44	969.2		0.045	
1089	190	2	47	23.3	902.4	-0.978	-24.53	875.2		0.093	
1090	190	2	47	45.1	1529.7	1.161	-23.14	1487.3		0.099	
1091	190	2	48	18.3	710.1	-1.057	-0.33	688.1		1.086	
1092	190	2	49	42.1	1370.4	-1.022	-27.63	1331.7		0.083	
1093	190	2	52	33.1	1550.6	1.178	3.11	1507.8		1.614	
1094	190	2	53	20.3	1651.7	-1.517	-31.34	1606.7		0.072	
1095	190	2	54	52.5	1548.0	1.177	-17.98	1505.3		0.142	
1096	190	2	55	52.7	617.2	1.118	-49.95	597.8		0.035	
1097	190	2	55	59.5	1550.2	1.136	-27.70	1507.4		0.083	
1098	190	2	59	23.1	1473.9	-1.348	-10.76	1432.8		0.327	
1099	190	3	0	16.3	720.6	-1.056	-10.31	698.4		0.344	
1100	190	3	3	51.7	1946.8	-0.062	-33.07	1895.6		0.067	
1101	190	3	7	4.3	1456.5	0.795	-8.49	1415.9		0.425	
1102	190	3	7	36.7	1081.1	-1.362	-27.01	1049.3		0.085	
1103	190	3	8	0.1	1812.4	-1.079	-31.74	1764.0		0.071	
1104	190	3	8	15.1	1130.7	-0.252	-15.94	1097.8		0.180	
1105	190	3	9	9.9	1307.5	0.318	-24.64	1270.2		0.093	
1106	190	3	10	16.3	759.2	-1.179	-50.25	735.8		0.035	
1107	190	3	10	44.7	575.7	-2.017	-52.03	557.5		0.033	
1108	190	3	11	22.7	609.8	-0.915	-20.03	590.6		0.113	
1109	190	3	11	31.7	970.3	-0.788	-43.44	941.4		0.045	
1110	190	3	11	43.9	656.0	-0.779	-51.24	635.5		0.034	
1111	190	3	12	3.9	1907.2	-1.276	-19.69	1856.9		0.117	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1112	190	3	14	42.5	961.4	-0.781	-42.37	932.7		0.047	
1113	190	3	15	59.3	1224.4	-1.591	-25.46	1189.2		0.090	
1114	190	3	17	2.9	651.3	-0.693	-49.08	630.9		0.036	
1115	190	3	18	20.1	796.3	0.917	-46.24	772.0		0.041	
1116	190	3	19	21.1	1976.3	-0.784	-31.74	1924.6		0.071	
1117	190	3	21	19.3	1872.2	-1.263	-15.05	1822.6		0.200	
1118	190	3	22	50.9	1754.4	-1.496	-28.40	1707.2		0.081	
1119	190	3	24	5.9	520.4	1.512	-44.68	503.8		0.043	
1120	190	3	25	5.9	743.1	-1.003	-47.02	720.2		0.039	
1121	190	3	27	14.5	1142.9	-1.496	-26.50	1109.6		0.087	
1122	190	3	28	31.1	965.0	-0.245	-14.28	936.2		0.218	
1123	190	3	29	43.1	1004.9	1.371	-45.04	975.1		0.043	
1124	190	3	30	25.9	606.2	-0.768	-46.82	587.1		0.040	
1125	190	3	31	18.3	1445.5	1.201	-27.01	1405.0		0.085	
1126	190	3	33	14.7	1122.7	0.380	-34.62	1089.9		0.063	
1127	190	3	35	27.1	1314.3	0.280	-23.30	1276.9		0.098	
1128	190	3	40	18.5	888.7	1.536	-23.62	861.9		0.097	
1129	190	3	41	12.5	1027.5	1.007	-24.03	997.1		0.095	
1130	190	3	41	58.5	1561.0	-1.533	-35.25	1518.0		0.062	
1131	190	3	42	45.5	851.2	-1.278	-36.76	825.4		0.058	
1132	190	3	42	45.5	851.2	-1.191	-36.76	825.4		0.058	
1133	190	3	42	46.5	1007.0	0.394	-24.92	977.1		0.092	
1134	190	3	42	46.5	1007.0	0.391	-24.92	977.1		0.092	
1135	190	3	43	3.5	857.1	-1.239	-17.64	831.2		0.148	
1136	190	3	46	44.5	716.6	-1.514	-16.98	694.5		0.160	
1137	190	3	48	3.7	797.7	-1.207	-15.12	773.3		0.198	
1138	190	3	48	8.5	878.3	-1.223	-19.87	851.8		0.115	
1139	190	3	49	10.1	1313.7	0.263	-25.06	1276.3		0.092	
1140	190	3	50	12.1	1380.5	0.578	-38.75	1341.6		0.054	
1141	190	3	50	18.5	800.4	-1.459	-40.76	775.9		0.050	
1142	190	3	51	7.3	1596.7	-1.421	-34.79	1552.9		0.063	
1143	190	3	51	46.9	1719.0	1.249	-21.28	1672.6		0.106	
1144	190	3	52	50.5	1314.7	0.301	-38.47	1277.3		0.055	
1145	190	3	54	46.9	1308.9	0.303	-28.50	1271.7		0.080	
1146	190	3	57	17.7	1929.3	-1.236	-25.64	1878.5		0.090	
1147	190	3	59	17.7	1307.8	0.270	-25.93	1270.5		0.089	
1148	190	4	0	41.7	851.1	-1.008	-42.53	825.3		0.047	
1149	190	4	0	48.9	1310.7	0.273	-36.28	1273.4		0.060	
1150	190	4	1	15.3	505.3	-0.790	-31.74	489.2		0.071	
1151	190	4	1	34.5	509.3	1.254	-52.60	493.0		0.032	
1152	190	4	1	45.3	1557.2	-0.927	-24.67	1514.2		0.093	
1153	190	4	3	53.1	1183.1	0.295	-34.58	1148.8		0.064	
1154	190	4	5	2.7	1334.8	0.243	-21.38	1296.9		0.105	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1155	190	4	5	33.5	1303.7	0.250	-21.57	1266.6		0.105	
1156	190	4	6	3.7	1154.3	0.359	-39.09	1120.8		0.053	
1157	190	4	6	29.9	730.8	1.095	-39.89	708.2		0.052	
1158	190	4	6	59.3	1322.1	0.253	-34.42	1284.5		0.064	
1159	190	4	7	9.3	670.0	0.931	-0.20	649.1		1.102	
1160	190	4	8	1.7	1309.6	0.250	-39.74	1272.3		0.052	
1161	190	4	8	21.1	916.6	-1.297	-41.39	889.1		0.049	
1162	190	4	9	5.1	1386.9	-1.413	-39.64	1347.8		0.052	
1163	190	4	10	17.3	1094.5	-0.646	-42.92	1062.4		0.046	
1164	190	4	10	26.7	1025.2	0.657	-42.81	994.8		0.046	
1165	190	4	11	24.3	2269.5	-1.033	-31.60	2212.1		0.071	
1166	190	4	12	19.7	1321.4	0.271	-28.05	1283.8		0.082	
1167	190	4	14	43.3	1061.4	-1.642	-32.95	1030.2		0.068	
1168	190	4	14	55.3	1314.0	0.274	-32.04	1276.6		0.070	
1169	190	4	15	19.1	996.3	-1.162	-37.95	966.7		0.056	
1170	190	4	16	9.7	1309.9	0.309	-25.70	1272.6		0.089	
1171	190	4	16	58.7	593.2	0.928	-48.58	574.5		0.037	
1172	190	4	17	28.7	1024.9	0.892	-32.68	994.6		0.068	
1173	190	4	17	45.7	793.9	-1.090	-33.42	769.6		0.066	
1174	190	4	17	58.3	648.2	-0.208	-14.16	628.0		0.221	
1175	190	4	19	50.9	1711.1	-1.314	-31.97	1664.8		0.070	
1176	190	4	20	26.7	1053.9	-1.487	-21.33	1022.9		0.106	
1177	190	4	20	30.9	1629.5	0.512	-24.50	1585.0		0.094	
1178	190	4	21	59.3	1484.6	-1.296	-27.01	1443.3		0.085	
1179	190	4	22	7.3	1337.5	-1.213	-27.23	1299.6		0.084	
1180	190	4	24	4.3	1317.1	0.268	-25.18	1279.6		0.091	
1181	190	4	24	4.9	1317.2	0.294	-24.89	1279.8		0.092	
1182	190	4	24	6.5	582.1	1.015	-8.82	563.7		0.409	
1183	190	4	24	48.9	1110.1	-0.973	-40.50	1077.6		0.051	
1184	190	4	25	16.3	810.8	-1.265	-48.87	786.0		0.037	
1185	190	4	26	40.5	808.5	0.763	-20.07	783.8		0.112	
1186	190	4	26	43.7	1705.8	-1.544	-34.66	1659.6		0.063	
1187	190	4	26	44.9	813.0	1.003	-46.36	788.2		0.040	
1188	190	4	26	48.7	966.3	-1.660	-43.90	937.5		0.044	
1189	190	4	28	36.1	686.4	0.880	-40.86	665.1		0.050	
1190	190	4	28	45.1	934.1	-1.429	-32.95	906.1		0.068	
1191	190	4	29	0.5	798.2	-1.154	-48.17	773.8		0.038	
1192	190	4	29	19.5	789.1	0.089	-47.96	764.9		0.038	
1193	190	4	29	24.1	790.4	0.348	-45.48	766.2		0.042	
1194	190	4	29	25.1	1575.9	-1.483	-18.57	1532.5		0.133	
1195	190	4	29	27.1	1573.0	-1.428	-16.06	1529.7		0.178	
1196	190	4	30	40.1	994.3	0.204	-42.76	964.7		0.046	
1197	190	4	31	9.3	1023.9	-1.062	-17.37	993.6		0.153	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1198	190	4	31	57.7	1310.7	0.279	-39.39	1273.3		0.053	
1199	190	4	33	55.1	1414.5	-1.165	-34.42	1374.8		0.064	
1200	190	4	35	14.7	829.4	-0.979	-22.41	804.2		0.101	
1201	190	4	37	4.9	1030.6	0.614	-30.63	1000.1		0.074	
1202	190	4	37	11.9	1039.9	0.950	-32.15	1009.2		0.070	
1203	190	4	37	11.9	1041.8	1.011	-32.15	1011.0		0.070	
1204	190	4	37	15.3	1075.1	1.504	-31.89	1043.5		0.070	
1205	190	4	37	19.3	1670.5	0.649	-25.99	1625.1		0.088	
1206	190	4	39	5.3	1046.0	-1.468	-5.93	1015.1		0.570	
1207	190	4	39	37.5	839.4	-1.394	-39.99	813.9		0.052	
1208	190	4	40	20.5	1025.9	-1.171	-31.49	995.5		0.072	
1209	190	4	40	53.7	1034.6	0.765	-42.09	1004.0		0.048	
1210	190	4	41	13.3	1516.9	-1.438	-37.86	1474.8		0.056	
1211	190	4	41	21.1	1257.9	1.271	-35.08	1221.8		0.062	
1212	190	4	45	10.3	1442.5	-1.446	-27.20	1402.2		0.084	
1213	190	4	45	11.3	1441.1	-1.397	-29.09	1400.7		0.078	
1214	190	4	45	14.5	816.8	0.722	-18.02	791.9		0.142	
1215	190	4	45	29.3	671.2	0.732	-49.81	650.3		0.035	
1216	190	4	45	57.1	763.2	-1.306	-25.52	739.7		0.090	
1217	190	4	47	12.5	1521.1	-1.067	-35.71	1479.0		0.061	
1218	190	4	47	29.9	904.5	-0.973	-45.17	877.3		0.042	
1219	190	4	50	34.9	611.9	0.837	-50.25	592.6		0.035	
1220	190	4	51	4.5	1473.3	-1.542	-11.53	1432.2		0.299	
1221	190	4	51	48.9	669.6	0.961	-49.59	648.7		0.036	
1222	190	4	52	33.5	1123.4	1.228	-25.78	1090.6		0.089	
1223	190	4	53	53.7	785.7	-1.292	-47.69	761.7		0.038	
1224	190	4	54	24.1	805.4	0.646	-46.36	780.8		0.040	
1225	190	4	55	14.5	1661.7	0.298	-28.46	1616.5		0.080	
1226	190	4	55	40.3	1601.3	-1.605	-12.73	1557.3		0.261	
1227	190	4	56	41.3	1017.5	1.193	5.33	987.4		2.083	
1228	190	4	57	3.1	1462.2	1.145	-3.55	1421.4		0.750	
1229	190	4	57	22.3	849.1	-0.977	-46.69	823.3		0.040	
1230	190	4	58	18.9	1117.4	-1.198	-42.04	1084.7		0.048	
1231	190	4	58	50.1	1747.4	-1.150	-31.23	1700.4		0.072	
1232	190	5	0	22.5	1510.3	-1.273	-33.50	1468.4		0.066	
1233	190	5	1	47.7	1538.9	-0.894	-32.08	1496.4		0.070	
1234	190	5	3	25.9	1131.3	-1.482	-25.41	1098.3		0.090	
1235	190	5	3	52.1	668.4	-1.050	-30.31	647.6		0.075	
1236	190	5	4	44.9	995.0	-1.158	-36.85	965.5		0.058	
1237	190	5	5	18.1	1476.6	-1.332	-35.16	1435.5		0.062	
1238	190	5	12	14.1	675.2	1.075	-26.74	654.1		0.086	
1239	190	5	13	40.9	1125.7	-1.185	-23.33	1092.9		0.098	
1240	190	5	16	57.3	2189.1	0.445	-24.33	2133.2		0.094	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1241	190	5	17	21.9	1048.1	-1.118	-32.34	1017.2		0.069	
1242	190	5	17	42.3	1672.9	-1.391	-22.08	1627.5		0.103	
1243	190	5	18	44.5	1082.1	-1.493	-34.95	1050.3		0.063	
1244	190	5	19	48.7	2056.5	-1.272	-28.05	2003.2		0.082	
1245	190	5	20	35.1	1926.1	-1.021	-30.17	1875.3		0.075	
1246	190	5	22	43.5	1604.9	-1.310	-25.58	1560.9		0.090	
1247	190	5	23	21.3	917.1	0.771	-41.60	889.6		0.049	
1248	190	5	25	3.7	622.9	-0.070	-53.77	603.4		0.030	
1249	190	5	25	35.1	1807.1	-1.306	-15.85	1758.8		0.182	
1250	190	5	26	2.5	1004.4	-0.753	-40.14	974.6		0.051	
1251	190	5	27	0.3	1143.2	-1.243	-27.66	1109.9		0.083	
1252	190	5	28	13.7	869.1	-1.542	-30.63	842.8		0.074	
1253	190	5	28	59.1	980.2	1.154	-31.34	951.0		0.072	
1254	190	5	30	38.3	1883.2	0.455	-19.52	1833.4		0.119	
1255	190	5	31	15.3	1895.1	1.576	-28.66	1845.0		0.080	
1256	190	5	33	20.3	594.3	-1.465	-8.09	575.5		0.445	
1257	190	5	36	1.7	829.3	-1.012	-22.67	804.1		0.100	
1258	190	5	36	31.5	1029.1	-1.120	-12.13	998.7		0.279	
1259	190	5	37	30.7	767.0	0.918	-35.25	743.4		0.062	
1260	190	5	40	52.3	1346.0	-1.613	-38.90	1307.9		0.054	
1261	190	5	41	6.3	1028.2	1.180	2.18	997.7		1.450	
1262	190	5	41	20.9	966.6	0.303	-24.11	937.7		0.095	
1263	190	5	44	20.1	563.7	1.463	-36.23	545.8		0.060	
1264	190	5	44	38.5	984.7	0.654	-32.38	955.3		0.069	
1265	190	5	46	2.5	518.4	1.301	-48.10	501.8		0.038	
1266	190	5	47	13.5	1125.0	-1.173	-32.68	1092.2		0.068	
1267	190	5	47	35.9	1394.1	-1.308	-31.13	1354.8		0.073	
1268	190	5	47	43.7	949.3	1.234	-43.09	920.9		0.046	
1269	190	5	47	48.9	989.3	1.257	-43.04	959.9		0.046	
1270	190	5	48	51.3	673.2	1.252	-24.17	652.3		0.095	
1271	190	5	50	43.9	467.5	1.224	-28.59	452.4		0.080	
1272	190	5	51	5.9	581.8	1.208	-31.63	563.4		0.071	
1273	190	5	51	22.1	1058.9	1.326	-23.95	1027.7		0.096	
1274	190	5	51	28.9	1089.1	-1.513	-23.95	1057.2		0.096	
1275	190	5	51	38.7	484.8	1.226	-40.76	469.2		0.050	
1276	190	5	51	55.9	519.8	1.273	-34.13	503.2		0.065	
1277	190	5	52	43.7	1566.1	0.504	-31.52	1523.0		0.071	
1278	190	5	53	32.5	497.3	1.235	-27.45	481.4		0.084	
1279	190	5	53	44.7	982.6	0.808	-39.59	953.3		0.052	
1280	190	5	53	53.5	629.6	1.228	-44.74	609.9		0.043	
1281	190	5	54	18.7	886.5	-1.085	-36.23	859.7		0.060	
1282	190	5	55	4.1	1020.5	0.555	-42.98	990.2		0.046	
1283	190	5	55	15.1	1533.4	-1.344	-21.40	1491.0		0.105	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1284	190	5	55	19.9	973.3	0.813	-35.50	944.3		0.061	
1285	190	5	55	20.3	1526.8	-1.207	-23.89	1484.6		0.096	
1286	190	5	55	23.3	625.2	1.161	-51.48	605.6		0.033	
1287	190	5	55	30.3	1516.4	-0.958	-35.20	1474.3		0.062	
1288	190	5	56	3.1	988.6	0.794	-44.92	959.2		0.043	
1289	190	5	56	34.7	988.3	0.804	-37.44	958.9		0.057	
1290	190	5	56	40.5	1016.8	0.580	-35.67	986.7		0.061	
1291	190	5	57	53.7	619.1	1.134	-44.92	599.6		0.043	
1292	190	5	58	19.5	489.3	1.191	-29.83	473.6		0.076	
1293	190	5	59	48.5	705.9	0.439	-50.86	684.0		0.034	
1294	190	6	2	0.3	1239.3	-1.076	-41.50	1203.7		0.049	
1295	190	6	2	7.5	1167.5	-0.232	-37.21	1133.6		0.057	
1296	190	6	3	6.5	876.8	-1.174	-33.61	850.3		0.066	
1297	190	6	3	38.5	997.8	1.172	-41.66	968.2		0.048	
1298	190	6	4	16.7	998.6	1.198	2.01	968.9		1.423	
1299	190	6	5	31.3	1137.8	-1.251	-24.69	1104.6		0.093	
1300	190	6	5	42.5	635.3	-1.434	-37.30	615.4		0.057	
1301	190	6	7	21.3	1446.6	1.137	-6.96	1406.1		0.506	
1302	190	6	8	13.7	713.3	-1.018	-44.86	691.3		0.043	
1303	190	6	8	44.9	740.2	-1.278	-48.24	717.4		0.038	
1304	190	6	9	53.3	934.9	-0.881	-44.02	906.9		0.044	
1305	190	6	10	9.9	892.4	-1.040	-26.77	865.5		0.086	
1306	190	6	10	53.3	1440.6	-1.313	-34.09	1400.3		0.065	
1307	190	6	11	37.1	674.8	-1.594	-26.56	653.8		0.086	
1308	190	6	11	41.5	1132.8	-1.459	-37.03	1099.7		0.058	
1309	190	6	12	11.9	369.2	0.201	-51.48	357.2		0.033	
1310	190	6	15	1.1	887.9	-0.935	-42.92	861.1		0.046	
1311	190	6	15	15.7	1477.5	-1.465	-37.90	1436.3		0.056	
1312	190	6	16	10.3	884.1	-1.117	-46.49	857.4		0.040	
1313	190	6	17	9.5	860.9	-1.345	-19.11	834.8		0.125	
1314	190	6	17	40.1	1167.4	-1.285	-37.81	1133.5		0.056	
1315	190	6	19	31.5	1229.9	0.784	-15.85	1194.5		0.182	
1316	190	6	20	4.7	786.9	1.412	-36.67	762.9		0.059	
1317	190	6	20	17.7	1231.4	-1.534	-41.50	1195.9		0.049	
1318	190	6	22	17.5	1461.5	-1.442	-30.88	1420.7		0.073	
1319	190	6	23	36.9	716.4	-1.364	-21.98	694.2		0.103	
1320	190	6	24	14.9	717.1	-1.111	-29.19	694.9		0.078	
1321	190	6	24	41.3	908.3	-1.556	-26.59	881.0		0.086	
1322	190	6	24	50.3	1346.4	-0.558	-29.19	1308.3		0.078	
1323	190	6	24	54.7	844.2	1.148	-23.86	818.6		0.096	
1324	190	6	25	39.1	1678.9	-1.497	-14.99	1633.3		0.201	
1325	190	6	26	49.9	575.0	0.177	-51.17	556.8		0.034	
1326	190	6	27	25.5	602.8	2.004	-49.44	583.9		0.036	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1327	190	6	27	57.1	2086.8	-1.425	-27.85	2032.9		0.082	
1328	190	6	28	12.7	460.7	1.443	-6.40	445.8		0.540	
1329	190	6	30	3.5	951.7	-0.983	-23.06	923.2		0.099	
1330	190	6	30	35.9	1499.3	-1.413	-38.28	1457.6		0.055	
1331	190	6	31	5.1	1133.5	-1.199	-33.50	1100.5		0.066	
1332	190	6	32	34.9	1444.1	-1.445	-27.57	1403.7		0.083	
1333	190	6	32	39.9	896.1	-1.005	-41.82	869.1		0.048	
1334	190	6	35	7.9	977.4	0.300	-44.62	948.3		0.043	
1335	190	6	36	29.5	487.5	0.216	-49.73	471.9		0.036	
1336	190	6	38	40.1	757.1	-1.565	-40.60	733.8		0.050	
1337	190	6	40	49.5	1567.8	-1.516	-23.03	1524.6		0.099	
1338	190	6	40	53.1	831.7	-1.038	-34.62	806.4		0.063	
1339	190	6	41	13.1	580.1	1.456	-41.18	561.8		0.049	
1340	190	6	41	18.7	949.8	-1.692	-46.75	921.4		0.040	
1341	190	6	41	25.3	835.4	-1.111	-28.63	810.0		0.080	
1342	190	6	42	40.1	641.2	0.953	-2.20	621.1		0.876	
1343	190	6	42	59.3	1528.1	-1.709	-28.86	1485.8		0.079	
1344	190	6	43	39.7	1529.1	-1.426	-26.32	1486.8		0.087	
1345	190	6	45	58.1	393.0	-1.353	-32.64	380.2		0.068	
1346	190	6	47	37.7	679.3	-0.017	-44.98	658.1		0.043	
1347	190	6	48	9.5	1495.0	1.101	-29.69	1453.5		0.077	
1348	190	6	48	54.3	821.1	0.776	-35.50	796.1		0.061	
1349	190	6	49	6.3	1546.7	-1.234	-30.73	1504.0		0.074	
1350	190	6	50	50.9	854.0	-1.110	-13.64	828.1		0.235	
1351	190	6	51	20.9	886.3	-0.359	-44.98	859.6		0.043	
1352	190	6	52	23.3	1719.6	-1.716	-34.54	1673.1		0.064	
1353	190	6	52	42.5	574.1	1.025	-25.49	555.9		0.090	
1354	190	6	55	50.7	578.4	1.097	-49.59	560.1		0.036	
1355	190	6	56	26.7	1457.7	1.156	-4.18	1416.9		0.697	
1356	190	6	56	46.9	864.1	-1.131	-6.85	837.9		0.513	
1357	190	6	58	1.5	952.9	0.736	-18.65	924.4		0.132	
1358	190	6	58	5.9	955.8	0.967	-42.59	927.2		0.047	
1359	190	6	58	32.9	1532.6	-1.486	-14.09	1490.2		0.223	
1360	190	7	0	10.5	1462.8	-1.241	-26.20	1422.0		0.088	
1361	190	7	0	45.5	1366.1	-1.426	-36.14	1327.5		0.060	
1362	190	7	1	0.7	1062.8	-1.235	-36.58	1031.5		0.059	
1363	190	7	1	54.1	772.0	-1.073	-48.80	748.3		0.037	
1364	190	7	2	21.5	1198.9	-1.537	-16.62	1164.3		0.167	
1365	190	7	2	49.7	1519.4	-1.347	2.90	1477.3		1.576	
1366	190	7	4	17.5	1002.6	0.721	1.22	972.8		1.298	
1367	190	7	4	40.7	1512.7	1.246	-28.11	1470.7		0.081	
1368	190	7	6	34.3	671.1	1.258	2.80	650.2		1.558	
1369	190	7	6	56.7	1123.8	-1.565	-29.36	1091.0		0.078	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1370	190	7	8	0.1	1143.7	-1.434	-19.55	1110.4		0.119	
1371	190	7	8	1.9	636.3	-1.013	2.52	616.3		1.508	
1372	190	7	8	9.7	1508.2	-1.337	-29.52	1466.3		0.077	
1373	190	7	8	30.5	1574.7	-1.370	-18.86	1531.4		0.129	
1374	190	7	10	2.9	752.4	0.681	-33.50	729.2		0.066	
1375	190	7	14	30.3	1402.1	-1.609	-24.98	1362.7		0.092	
1376	190	7	14	40.9	906.8	-0.964	-41.60	879.6		0.049	
1377	190	7	16	58.7	1054.5	1.139	9.11	1023.4		3.222	
1378	190	7	17	3.5	1060.4	1.338	-22.15	1029.2		0.102	
1379	190	7	17	4.1	1410.2	-1.568	-24.36	1370.6		0.094	
1380	190	7	17	31.5	826.5	-1.469	-6.79	801.4		0.516	
1381	190	7	17	45.3	853.6	-1.123	-45.60	827.7		0.042	
1382	190	7	18	6.1	1465.0	1.292	-29.49	1424.1		0.077	
1383	190	7	18	16.5	941.0	-1.074	-29.63	912.8		0.077	
1384	190	7	18	20.3	625.7	-1.211	-28.96	606.1		0.079	
1385	190	7	18	33.9	963.0	0.152	-24.47	934.2		0.094	
1386	190	7	18	36.9	1590.7	-1.404	-35.29	1547.1		0.062	
1387	190	7	19	4.7	920.2	-1.135	-38.71	892.6		0.054	
1388	190	7	19	50.5	1497.0	1.139	-3.05	1455.4		0.795	
1389	190	7	19	56.9	1894.6	-1.665	-24.11	1844.5		0.095	
1390	190	7	19	58.3	1892.3	-1.638	-24.33	1842.2		0.094	
1391	190	7	19	58.9	742.7	-0.882	-42.26	719.8		0.047	
1392	190	7	20	25.3	802.7	-1.153	-39.44	778.2		0.053	
1393	190	7	20	46.1	1085.4	-1.529	-37.49	1053.6		0.057	
1394	190	7	20	50.7	757.9	-1.095	-15.05	734.6		0.199	
1395	190	7	21	8.1	870.5	-1.091	-39.05	844.2		0.054	
1396	190	7	21	57.5	878.4	-1.126	1.66	851.8		1.366	
1397	190	7	22	22.7	831.7	-1.455	-8.14	806.4		0.442	
1398	190	7	22	41.7	848.5	-1.445	-44.26	822.8		0.044	
1399	190	7	23	30.5	1451.4	1.051	-32.83	1410.8		0.068	
1400	190	7	24	6.1	1536.2	-1.440	-30.49	1493.7		0.074	
1401	190	7	25	2.7	1650.4	-1.434	-32.34	1605.4		0.069	
1402	190	7	25	24.9	862.5	-1.066	-22.88	836.4		0.100	
1403	190	7	27	57.3	1109.2	0.518	-39.29	1076.7		0.053	
1404	190	7	29	12.9	862.4	-1.093	-11.86	836.2		0.288	
1405	190	7	30	46.7	1553.8	-1.405	-28.17	1511.0		0.081	
1406	190	7	30	49.3	992.8	1.246	-39.29	963.2		0.053	
1407	190	7	31	21.1	728.6	-1.018	-48.73	706.1		0.037	
1408	190	7	32	6.7	1014.7	-0.769	-37.35	984.7		0.057	
1409	190	7	32	19.7	1598.3	-1.706	-36.67	1554.4		0.059	
1410	190	7	35	56.9	1459.5	1.288	-27.51	1418.7		0.083	
1411	190	7	36	3.3	662.1	1.416	-47.35	641.4		0.039	
1412	190	7	36	25.7	1463.6	-1.630	-18.85	1422.7		0.129	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1413	190	7	36	50.9	1022.0	-1.138	-27.57	991.7		0.083	
1414	190	7	37	4.9	1380.7	-1.448	-23.92	1341.7		0.096	
1415	190	7	37	7.1	866.7	-1.038	-32.42	840.4		0.069	
1416	190	7	38	42.7	781.9	1.098	-36.67	758.0		0.059	
1417	190	7	39	16.5	663.7	-1.271	-29.42	643.0		0.077	
1418	190	7	39	50.7	1057.8	-0.962	-30.38	1026.6		0.075	
1419	190	7	39	52.1	788.8	-1.594	-12.03	764.6		0.283	
1420	190	7	40	39.7	789.6	-1.558	-24.67	765.4		0.093	
1421	190	7	40	44.7	868.8	-1.094	-31.74	842.5		0.071	
1422	190	7	42	20.7	1467.0	1.159	-7.09	1426.1		0.499	
1423	190	7	43	40.1	868.7	-1.108	-44.08	842.4		0.044	
1424	190	7	43	51.7	781.6	-0.959	-40.14	757.7		0.051	
1425	190	7	44	9.9	1037.1	0.836	-25.03	1006.5		0.092	
1426	190	7	45	19.5	915.6	0.741	-19.83	888.1		0.115	
1427	190	7	45	48.5	1387.9	-1.194	-38.61	1348.8		0.054	
1428	190	7	46	5.9	1540.9	-1.358	-32.42	1498.3		0.069	
1429	190	7	46	27.5	1500.4	-1.556	-36.06	1458.7		0.060	
1430	190	7	46	38.1	1469.5	1.138	-2.30	1428.5		0.866	
1431	190	7	48	25.3	1528.6	-1.567	-12.89	1486.3		0.256	
1432	190	7	48	51.7	957.4	-1.552	-33.18	928.8		0.067	
1433	190	7	49	4.5	871.8	-1.073	-30.63	845.4		0.074	
1434	190	7	50	5.5	613.4	1.344	-22.77	594.1		0.100	
1435	190	7	50	55.3	863.1	-1.074	-31.89	836.9		0.070	
1436	190	7	53	41.3	1475.3	1.194	-16.89	1434.2		0.161	
1437	190	7	53	51.9	580.0	-1.063	-34.70	561.7		0.063	
1438	190	7	54	7.7	1470.8	1.162	-12.59	1429.8		0.265	
1439	190	7	55	34.7	788.4	-1.650	-43.96	764.2		0.044	
1440	190	7	55	55.3	1669.4	-0.951	-21.93	1624.0		0.103	
1441	190	7	56	29.5	1767.3	-1.310	-17.27	1719.8		0.155	
1442	190	7	56	54.5	864.0	-1.005	-30.52	837.9		0.074	
1443	190	7	57	56.3	826.1	-1.305	-35.58	800.9		0.061	
1444	190	7	58	11.9	1026.7	0.814	-43.09	996.3		0.046	
1445	190	7	58	26.5	659.6	1.243	-0.88	639.0		1.020	
1446	190	8	1	1.5	912.7	-1.131	-20.24	885.2		0.110	
1447	190	8	4	38.4	997.4	1.183	-42.64	967.8		0.047	
1448	190	8	5	39.0	1163.5	-1.468	-13.73	1129.7		0.232	
1449	190	8	10	16.0	1472.8	-1.332	-33.57	1431.7		0.066	
1450	190	8	10	51.2	2242.0	-0.463	-23.33	2185.1		0.098	
1451	190	8	10	53.8	1457.8	-1.406	2.32	1417.1		1.473	
1452	190	8	14	22.2	1096.2	-1.507	-21.57	1064.0		0.105	
1453	190	8	15	23.4	956.2	-1.161	-27.89	927.6		0.082	
1454	190	8	17	10.8	1523.2	-1.534	-24.72	1481.0		0.093	
1455	190	8	17	34.0	1068.4	-1.109	-19.36	1037.0		0.122	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1456	190	8	17	41.8	746.7	-1.394	-48.80	723.7		0.037	
1457	190	8	17	48.4	1721.3	0.330	-31.31	1674.8		0.072	
1458	190	8	19	28.6	1548.4	-1.478	-33.38	1505.7		0.067	
1459	190	8	20	22.8	1240.1	1.057	-35.71	1204.5		0.061	
1460	190	8	20	43.2	1592.7	-1.440	-32.38	1548.9		0.069	
1461	190	8	21	3.2	1431.5	-1.663	-14.54	1391.4		0.212	
1462	190	8	21	11.6	1561.8	-1.488	-2.83	1518.8		0.815	
1463	190	8	22	14.0	904.2	-1.060	-39.84	877.0		0.052	
1464	190	8	23	12.4	599.7	0.946	-30.91	580.8		0.073	
1465	190	8	25	4.2	1447.2	-1.557	-24.75	1406.7		0.093	
1466	190	8	28	15.6	656.0	-0.998	-42.04	635.5		0.048	
1467	190	8	28	41.4	1465.7	1.126	-5.75	1424.8		0.582	
1468	190	8	30	49.6	1752.1	-1.515	-19.99	1705.0		0.113	
1469	190	8	31	17.2	840.6	-1.115	-43.50	815.1		0.045	
1470	190	8	36	52.8	1569.3	-0.991	-34.50	1526.1		0.064	
1471	190	8	39	26.0	1470.7	1.127	-32.80	1429.7		0.068	
1472	190	8	39	52.6	1019.4	1.218	-15.69	989.2		0.185	
1473	190	8	41	6.4	1532.9	-1.526	-1.33	1490.5		0.968	
1474	190	8	42	31.0	1266.5	-1.270	-35.08	1230.2		0.062	
1475	190	8	43	49.8	1546.9	-1.432	-37.26	1504.2		0.057	
1476	190	8	44	39.4	724.2	-1.753	-22.69	701.9		0.100	
1477	190	8	44	55.6	1280.7	-1.457	-34.74	1244.1		0.063	
1478	190	8	46	44.4	1934.3	-1.817	-32.83	1883.4		0.068	
1479	190	8	49	13.4	1364.2	-1.489	-28.11	1325.6		0.081	
1480	190	8	49	48.4	1042.0	1.188	-37.44	1011.2		0.057	
1481	190	8	50	32.6	1051.9	0.721	-6.51	1020.9		0.533	
1482	190	8	50	45.2	1430.9	0.709	-31.82	1390.8		0.071	
1483	190	8	50	45.2	1430.9	0.708	-31.82	1390.8		0.071	
1484	190	8	50	48.2	706.1	-0.896	-10.47	684.3		0.338	
1485	190	8	51	19.0	1455.8	-1.580	-30.98	1415.1		0.073	
1486	190	8	51	54.6	1534.3	-1.490	-15.62	1491.9		0.187	
1487	190	8	52	4.0	906.4	1.390	-32.42	879.1		0.069	
1488	190	8	53	18.4	1064.4	-1.095	8.55	1033.1		3.019	
1489	190	8	53	29.2	1053.9	-0.610	-42.42	1022.8		0.047	
1490	190	8	53	30.0	745.5	-0.665	-48.10	722.5		0.038	
1491	190	8	53	30.0	745.1	-0.676	-48.10	722.2		0.038	
1492	190	8	55	53.0	1515.7	-1.506	-5.77	1473.7		0.581	
1493	190	8	55	53.8	928.2	-1.565	-20.06	900.4		0.112	
1494	190	8	55	54.2	1513.9	-1.483	-9.76	1472.0		0.367	
1495	190	8	55	57.8	922.1	-1.345	-45.35	894.5		0.042	
1496	190	8	56	0.2	1505.6	-1.319	-26.26	1463.8		0.087	
1497	190	8	58	26.0	1109.7	-1.291	-32.83	1077.3		0.068	
1498	190	8	58	45.8	1037.2	1.125	-17.69	1006.5		0.147	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1499	190	8	58	54.4	1389.9	-1.127	-15.93	1350.7		0.180	
1500	190	8	59	1.8	1412.0	-1.659	-35.25	1372.4		0.062	
1501	190	8	59	46.8	929.0	-0.741	-38.47	901.1		0.055	
1502	190	0	1	22.9	1525.2	-1.531	-19.04	1483.0		0.126	
1503	190	0	8	22.7	1150.3	1.902	-36.19	1116.8		0.060	
1504	190	0	9	7.3	1031.6	1.017	-26.35	1001.0		0.087	
1505	190	0	9	27.7	1003.6	0.270	-45.10	973.8		0.042	
1506	190	0	10	25.5	1451.3	0.635	-17.19	1410.7		0.156	
1507	190	0	11	24.7	1305.4	0.811	-39.94	1268.2		0.052	
1508	190	0	12	5.1	1053.9	1.115	-42.20	1022.9		0.047	
1509	190	0	12	31.1	598.4	1.603	-51.48	579.6		0.033	
1510	190	0	12	57.9	529.9	1.592	-29.52	513.0		0.077	
1511	190	0	14	21.3	1440.1	0.528	-30.42	1399.8		0.075	
1512	190	0	14	22.5	708.1	1.287	-29.22	686.1		0.078	
1513	190	0	14	29.7	1445.5	0.768	-31.63	1405.0		0.071	
1514	190	0	14	35.5	819.0	-1.288	-45.04	794.1		0.043	
1515	190	0	14	51.7	1474.2	0.674	-31.38	1433.1		0.072	
1516	190	0	15	4.9	869.8	0.685	-45.17	843.5		0.042	
1517	190	0	15	31.7	729.2	-1.318	-45.66	706.7		0.042	
1518	190	0	17	10.5	1012.7	1.139	7.25	982.7		2.598	
1519	190	0	18	7.9	613.7	-0.472	-43.50	594.4		0.045	
1520	190	0	23	2.7	1368.8	-0.485	-29.59	1330.1		0.077	
1521	190	0	23	17.1	983.7	0.784	-37.90	954.4		0.056	
1522	190	0	23	23.7	1064.4	-1.167	-20.64	1033.1		0.108	
1523	190	0	23	29.5	1041.0	1.075	-41.02	1010.2		0.050	
1524	190	0	23	42.1	1017.9	0.718	-2.20	987.7		0.876	
1525	190	0	24	50.9	1282.2	-1.372	-36.50	1245.6		0.059	
1526	190	0	28	26.7	849.5	-1.521	-46.62	823.7		0.040	
1527	190	0	28	56.9	1603.3	-1.585	-14.91	1559.3		0.203	
1528	190	0	32	14.9	652.0	-0.770	-36.14	631.6		0.060	
1529	190	0	32	41.1	577.6	0.969	-6.87	559.4		0.511	
1530	190	0	34	48.1	1045.0	1.020	-30.88	1014.2		0.073	
1531	190	0	35	10.9	1465.0	0.597	-8.49	1424.1		0.425	
1532	190	0	37	55.9	812.0	0.716	-1.40	787.2		0.960	
1533	190	0	42	19.5	1450.6	0.660	-31.23	1410.0		0.072	
1534	190	0	42	57.3	1478.1	0.477	-19.29	1437.0		0.123	
1535	190	0	43	2.9	1193.1	-0.205	-7.16	1158.6		0.495	
1536	190	0	44	13.5	1038.0	1.465	-44.56	1007.3		0.043	
1537	190	0	44	28.3	992.7	1.091	-28.30	963.2		0.081	
1538	190	0	44	34.7	742.0	-1.446	-36.81	719.1		0.058	
1539	190	0	46	2.7	688.4	1.392	-45.79	667.0		0.041	
1540	190	0	47	26.7	1077.3	1.147	-28.66	1045.7		0.080	
1541	190	0	47	58.5	808.0	-1.431	-44.62	783.3		0.043	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1542	190	0	50	5.5	1051.0	-1.176	-16.34	1020.0		0.172	
1543	190	0	51	6.1	1461.0	0.465	-12.72	1420.2		0.261	
1544	190	0	51	47.7	982.0	0.262	-44.08	952.8		0.044	
1545	190	0	53	3.3	509.1	0.260	-28.01	492.9		0.082	
1546	190	0	53	36.9	507.8	0.201	-18.78	491.5		0.130	
1547	190	0	53	56.3	1564.0	-1.237	-35.76	1520.9		0.061	
1548	190	0	54	21.3	1424.3	-1.486	-29.66	1384.3		0.077	
1549	190	0	54	41.5	1137.4	-1.149	-7.61	1104.2		0.470	
1550	190	0	54	54.5	1541.2	-1.510	-31.38	1498.6		0.072	
1551	190	0	55	56.9	1557.8	0.462	-32.57	1514.8		0.069	
1552	190	0	56	13.5	1255.7	-1.194	-27.95	1219.7		0.082	
1553	190	1	0	50.7	569.6	1.454	-49.44	551.5		0.036	
1554	190	1	3	2.3	947.1	-1.393	1.14	918.7		1.287	
1555	190	1	3	59.5	890.6	0.736	-41.44	863.7		0.049	
1556	190	1	4	17.9	1557.4	-0.609	9.16	1514.4		3.238	
1557	190	1	5	22.1	569.6	-1.449	-40.55	551.6		0.051	
1558	190	1	5	54.3	1022.4	1.159	1.11	992.2		1.282	
1559	190	1	6	45.9	1487.1	0.760	-33.89	1445.7		0.065	
1560	190	1	8	1.9	1076.2	-1.478	-41.93	1044.6		0.048	
1561	190	1	9	34.1	1198.6	-0.997	-37.76	1164.0		0.056	
1562	190	1	10	8.3	1047.2	1.158	-22.96	1016.3		0.099	
1563	190	1	10	27.9	1347.3	-1.552	-38.90	1309.2		0.054	
1564	190	1	10	55.9	1465.2	0.609	3.80	1424.3		1.748	
1565	190	1	13	10.1	1199.1	0.795	-34.50	1164.5		0.064	
1566	190	1	13	28.1	1062.5	1.403	-43.38	1031.2		0.045	
1567	190	1	14	13.1	1079.1	1.223	-32.95	1047.4		0.068	
1568	190	1	14	19.3	1435.5	0.844	-33.03	1395.3		0.067	
1569	190	1	14	41.5	797.3	0.926	-43.50	772.9		0.045	
1570	190	1	15	28.1	1047.1	0.278	-18.80	1016.2		0.130	
1571	190	1	17	6.7	1093.7	-1.191	-17.34	1061.6		0.153	
1572	190	1	18	13.1	1465.4	0.611	-7.22	1424.5		0.491	
1573	190	1	19	42.5	830.5	0.973	-23.73	805.2		0.096	
1574	190	1	20	29.3	869.1	-1.284	-27.60	842.8		0.083	
1575	190	1	21	48.5	416.7	1.093	-43.96	403.1		0.044	
1576	190	1	24	18.3	1464.4	0.622	-7.78	1423.5		0.461	
1577	190	1	26	13.1	814.7	-1.361	-20.22	789.9		0.110	
1578	190	1	27	40.5	595.7	0.671	-31.63	576.9		0.071	
1579	190	1	28	59.1	1470.6	1.152	-5.60	1429.6		0.592	
1580	190	1	29	28.3	1024.4	1.069	-33.22	994.1		0.067	
1581	190	1	31	51.5	1037.1	-1.166	-42.64	1006.5		0.047	
1582	190	1	33	31.3	821.6	0.572	-28.30	796.6		0.081	
1583	190	1	34	24.1	660.8	1.533	-47.82	640.1		0.038	
1584	190	1	35	19.7	472.2	1.586	-50.10	457.0		0.035	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1585	190	1	40	0.7	1006.4	1.091	-44.74	976.6		0.043	
1586	190	1	44	20.5	1000.8	1.115	-18.37	971.1		0.136	
1587	190	1	44	41.7	1042.3	0.690	0.98	1011.5		1.263	
1588	190	1	44	58.7	1471.9	1.157	-21.62	1430.9		0.104	
1589	190	1	46	36.3	731.7	1.371	-18.61	709.2		0.132	
1590	190	1	48	35.9	1552.7	-1.421	-34.99	1509.8		0.063	
1591	190	1	49	54.3	924.7	0.967	-27.51	896.9		0.083	
1592	190	1	53	0.9	998.2	1.111	-25.70	968.6		0.089	
1593	190	1	53	17.7	1049.5	0.179	-31.82	1018.6		0.071	
1594	190	1	55	32.3	725.1	-1.719	-48.58	702.7		0.037	
1595	190	1	56	26.5	1556.8	1.053	-28.56	1513.9		0.080	
1596	190	1	56	31.9	765.3	-1.325	-38.80	741.8		0.054	
1597	190	1	57	8.9	1870.8	-1.240	-14.48	1821.2		0.213	
1598	190	1	59	59.1	1462.4	1.119	-12.65	1421.6		0.263	
1599	190	2	0	49.7	833.3	-1.383	-4.47	808.0		0.674	
1600	190	2	3	19.9	1017.8	1.176	4.46	987.6		1.885	
1601	190	2	4	35.3	1234.1	-1.621	-31.23	1198.6		0.072	
1602	190	2	6	36.7	1545.8	1.303	-33.85	1503.1		0.065	
1603	190	2	7	2.1	1472.9	1.151	-14.33	1431.9		0.217	
1604	190	2	7	25.7	1001.0	-1.558	-45.48	971.2		0.042	
1605	190	2	8	28.7	640.9	0.774	-40.97	620.8		0.050	
1606	190	2	10	20.1	1443.0	0.486	-24.95	1402.6		0.092	
1607	190	2	11	36.3	1538.5	1.163	-8.46	1496.0		0.426	
1608	190	2	11	40.7	1079.8	-1.546	-23.27	1048.1		0.098	
1609	190	2	11	43.7	1547.8	1.353	-31.13	1505.1		0.073	
1610	190	2	13	53.7	867.4	1.198	-36.63	841.1		0.059	
1611	190	2	16	34.5	754.1	-1.583	-3.43	730.9		0.761	
1612	190	2	18	11.7	812.9	-0.681	-40.55	788.1		0.051	
1613	190	2	19	1.1	797.5	-1.465	-43.67	773.1		0.045	
1614	190	2	20	43.3	1026.4	1.231	-42.09	996.1		0.048	
1615	190	2	25	28.5	892.5	1.049	2.94	865.6		1.584	
1616	190	2	25	32.9	1870.1	1.416	-31.23	1820.5		0.072	
1617	190	2	26	6.5	1056.8	1.208	-13.07	1025.6		0.251	
1618	190	2	26	22.1	665.3	1.336	-40.65	644.5		0.050	
1619	190	2	27	19.7	1481.7	1.075	-36.63	1440.4		0.059	
1620	190	2	27	21.1	696.8	-0.956	-45.35	675.2		0.042	
1621	190	2	27	27.7	1490.5	1.268	-36.58	1449.1		0.059	
1622	190	2	30	38.9	985.5	0.910	-25.64	956.2		0.090	
1623	190	2	31	20.3	657.5	1.070	-30.17	637.0		0.075	
1624	190	2	32	23.5	830.9	0.824	-47.35	805.6		0.039	
1625	190	2	34	2.3	1472.1	1.141	-3.91	1431.0		0.720	
1626	190	2	34	29.1	947.7	1.490	-19.62	919.4		0.118	
1627	190	2	35	48.9	1497.6	-1.527	-36.67	1456.0		0.059	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1628	190	2	37	8.9	1551.9	-1.422	-20.81	1509.0		0.108	
1629	190	2	38	6.3	678.5	-1.280	-34.46	657.4		0.064	
1630	190	2	38	18.1	1826.6	0.696	-25.09	1777.9		0.091	
1631	190	2	38	27.7	710.3	-1.093	-31.71	688.3		0.071	
1632	190	2	38	45.5	702.7	0.204	-48.87	680.9		0.037	
1633	190	2	38	47.3	839.5	-1.112	-41.76	814.0		0.048	
1634	190	2	39	7.5	946.2	-1.409	-20.06	917.8		0.112	
1635	190	2	39	46.9	964.0	-0.808	-44.38	935.2		0.044	
1636	190	2	41	35.9	814.5	0.707	-4.09	789.7		0.704	
1637	190	2	43	14.5	784.4	0.706	1.66	760.3		1.366	
1638	190	2	44	55.9	1531.6	1.137	-6.54	1489.2		0.532	
1639	190	2	45	11.1	998.9	0.736	-43.44	969.2		0.045	
1640	190	2	47	23.3	902.4	-0.978	-24.53	875.2		0.093	
1641	190	2	47	45.1	1529.7	1.161	-23.14	1487.3		0.099	
1642	190	2	48	18.3	710.1	-1.057	-0.33	688.1		1.086	
1643	190	2	49	42.1	1370.4	-1.022	-27.63	1331.7		0.083	
1644	190	2	52	33.1	1550.6	1.178	3.11	1507.8		1.614	
1645	190	2	53	20.3	1651.7	-1.517	-31.34	1606.7		0.072	
1646	190	2	54	52.5	1548.0	1.177	-17.98	1505.3		0.142	
1647	190	2	55	52.7	617.2	1.118	-49.95	597.8		0.035	
1648	190	2	55	59.5	1550.2	1.136	-27.70	1507.4		0.083	
1649	190	2	59	23.1	1473.9	-1.348	-10.76	1432.8		0.327	
1650	190	3	0	16.3	720.6	-1.056	-10.31	698.4		0.344	
1651	190	3	3	51.7	1946.8	-0.062	-33.07	1895.6		0.067	
1652	190	3	7	4.3	1456.5	0.795	-8.49	1415.9		0.425	
1653	190	3	7	36.7	1081.1	-1.362	-27.01	1049.3		0.085	
1654	190	3	8	0.1	1812.4	-1.079	-31.74	1764.0		0.071	
1655	190	3	8	15.1	1130.7	-0.252	-15.94	1097.8		0.180	
1656	190	3	9	9.9	1307.5	0.318	-24.64	1270.2		0.093	
1657	190	3	10	16.3	759.2	-1.179	-50.25	735.8		0.035	
1658	190	3	10	44.7	575.7	-2.017	-52.03	557.5		0.033	
1659	190	3	11	22.7	609.8	-0.915	-20.03	590.6		0.113	
1660	190	3	11	31.7	970.3	-0.788	-43.44	941.4		0.045	
1661	190	3	11	43.9	656.0	-0.779	-51.24	635.5		0.034	
1662	190	3	12	3.9	1907.2	-1.276	-19.69	1856.9		0.117	
1663	190	3	14	42.5	961.4	-0.781	-42.37	932.7		0.047	
1664	190	3	15	59.3	1224.4	-1.591	-25.46	1189.2		0.090	
1665	190	3	17	2.9	651.3	-0.693	-49.08	630.9		0.036	
1666	190	3	18	20.1	796.3	0.917	-46.24	772.0		0.041	
1667	190	3	19	21.1	1976.3	-0.784	-31.74	1924.6		0.071	
1668	190	3	21	19.3	1872.2	-1.263	-15.05	1822.6		0.200	
1669	190	3	22	50.9	1754.4	-1.496	-28.40	1707.2		0.081	
1670	190	3	24	5.9	520.4	1.512	-44.68	503.8		0.043	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1671	190	3	25	5.9	743.1	-1.003	-47.02	720.2		0.039	
1672	190	3	27	14.5	1142.9	-1.496	-26.50	1109.6		0.087	
1673	190	3	28	31.1	965.0	-0.245	-14.28	936.2		0.218	
1674	190	3	29	43.1	1004.9	1.371	-45.04	975.1		0.043	
1675	190	3	30	25.9	606.2	-0.768	-46.82	587.1		0.040	
1676	190	3	31	18.3	1445.5	1.201	-27.01	1405.0		0.085	
1677	190	3	33	14.7	1122.7	0.380	-34.62	1089.9		0.063	
1678	190	3	35	27.1	1314.3	0.280	-23.30	1276.9		0.098	
1679	190	3	40	18.5	888.7	1.536	-23.62	861.9		0.097	
1680	190	3	41	12.5	1027.5	1.007	-24.03	997.1		0.095	
1681	190	3	41	58.5	1561.0	-1.533	-35.25	1518.0		0.062	
1682	190	3	42	45.5	851.2	-1.278	-36.76	825.4		0.058	
1683	190	3	42	45.5	851.2	-1.191	-36.76	825.4		0.058	
1684	190	3	42	46.5	1007.0	0.394	-24.92	977.1		0.092	
1685	190	3	42	46.5	1007.0	0.391	-24.92	977.1		0.092	
1686	190	3	43	3.5	857.1	-1.239	-17.64	831.2		0.148	
1687	190	3	46	44.5	716.6	-1.514	-16.98	694.5		0.160	
1688	190	3	48	3.7	797.7	-1.207	-15.12	773.3		0.198	
1689	190	3	48	8.5	878.3	-1.223	-19.87	851.8		0.115	
1690	190	3	49	10.1	1313.7	0.263	-25.06	1276.3		0.092	
1691	190	3	50	12.1	1380.5	0.578	-38.75	1341.6		0.054	
1692	190	3	50	18.5	800.4	-1.459	-40.76	775.9		0.050	
1693	190	3	51	7.3	1596.7	-1.421	-34.79	1552.9		0.063	
1694	190	3	51	46.9	1719.0	1.249	-21.28	1672.6		0.106	
1695	190	3	52	50.5	1314.7	0.301	-38.47	1277.3		0.055	
1696	190	3	54	46.9	1308.9	0.303	-28.50	1271.7		0.080	
1697	190	3	57	17.7	1929.3	-1.236	-25.64	1878.5		0.090	
1698	190	3	59	17.7	1307.8	0.270	-25.93	1270.5		0.089	
1699	190	4	0	41.7	851.1	-1.008	-42.53	825.3		0.047	
1700	190	4	0	48.9	1310.7	0.273	-36.28	1273.4		0.060	
1701	190	4	1	15.3	505.3	-0.790	-31.74	489.2		0.071	
1702	190	4	1	34.5	509.3	1.254	-52.60	493.0		0.032	
1703	190	4	1	45.3	1557.2	-0.927	-24.67	1514.2		0.093	
1704	190	4	3	53.1	1183.1	0.295	-34.58	1148.8		0.064	
1705	190	4	5	2.7	1334.8	0.243	-21.38	1296.9		0.105	
1706	190	4	5	33.5	1303.7	0.250	-21.57	1266.6		0.105	
1707	190	4	6	3.7	1154.3	0.359	-39.09	1120.8		0.053	
1708	190	4	6	29.9	730.8	1.095	-39.89	708.2		0.052	
1709	190	4	6	59.3	1322.1	0.253	-34.42	1284.5		0.064	
1710	190	4	7	9.3	670.0	0.931	-0.20	649.1		1.102	
1711	190	4	8	1.7	1309.6	0.250	-39.74	1272.3		0.052	
1712	190	4	8	21.1	916.6	-1.297	-41.39	889.1		0.049	
1713	190	4	9	5.1	1386.9	-1.413	-39.64	1347.8		0.052	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1714	190	4	10	17.3	1094.5	-0.646	-42.92	1062.4		0.046	
1715	190	4	10	26.7	1025.2	0.657	-42.81	994.8		0.046	
1716	190	4	11	24.3	2269.5	-1.033	-31.60	2212.1		0.071	
1717	190	4	12	19.7	1321.4	0.271	-28.05	1283.8		0.082	
1718	190	4	14	43.3	1061.4	-1.642	-32.95	1030.2		0.068	
1719	190	4	14	55.3	1314.0	0.274	-32.04	1276.6		0.070	
1720	190	4	15	19.1	996.3	-1.162	-37.95	966.7		0.056	
1721	190	4	16	9.7	1309.9	0.309	-25.70	1272.6		0.089	
1722	190	4	16	58.7	593.2	0.928	-48.58	574.5		0.037	
1723	190	4	17	28.7	1024.9	0.892	-32.68	994.6		0.068	
1724	190	4	17	45.7	793.9	-1.090	-33.42	769.6		0.066	
1725	190	4	17	58.3	648.2	-0.208	-14.16	628.0		0.221	
1726	190	4	19	50.9	1711.1	-1.314	-31.97	1664.8		0.070	
1727	190	4	20	26.7	1053.9	-1.487	-21.33	1022.9		0.106	
1728	190	4	20	30.9	1629.5	0.512	-24.50	1585.0		0.094	
1729	190	4	21	59.3	1484.6	-1.296	-27.01	1443.3		0.085	
1730	190	4	22	7.3	1337.5	-1.213	-27.23	1299.6		0.084	
1731	190	4	24	4.3	1317.1	0.268	-25.18	1279.6		0.091	
1732	190	4	24	4.9	1317.2	0.294	-24.89	1279.8		0.092	
1733	190	4	24	6.5	582.1	1.015	-8.82	563.7		0.409	
1734	190	4	24	48.9	1110.1	-0.973	-40.50	1077.6		0.051	
1735	190	4	25	16.3	810.8	-1.265	-48.87	786.0		0.037	
1736	190	4	26	40.5	808.5	0.763	-20.07	783.8		0.112	
1737	190	4	26	43.7	1705.8	-1.544	-34.66	1659.6		0.063	
1738	190	4	26	44.9	813.0	1.003	-46.36	788.2		0.040	
1739	190	4	26	48.7	966.3	-1.660	-43.90	937.5		0.044	
1740	190	4	28	36.1	686.4	0.880	-40.86	665.1		0.050	
1741	190	4	28	45.1	934.1	-1.429	-32.95	906.1		0.068	
1742	190	4	29	0.5	798.2	-1.154	-48.17	773.8		0.038	
1743	190	4	29	19.5	789.1	0.089	-47.96	764.9		0.038	
1744	190	4	29	24.1	790.4	0.348	-45.48	766.2		0.042	
1745	190	4	29	25.1	1575.9	-1.483	-18.57	1532.5		0.133	
1746	190	4	29	27.1	1573.0	-1.428	-16.06	1529.7		0.178	
1747	190	4	30	40.1	994.3	0.204	-42.76	964.7		0.046	
1748	190	4	31	9.3	1023.9	-1.062	-17.37	993.6		0.153	
1749	190	4	31	57.7	1310.7	0.279	-39.39	1273.3		0.053	
1750	190	4	33	55.1	1414.5	-1.165	-34.42	1374.8		0.064	
1751	190	4	35	14.7	829.4	-0.979	-22.41	804.2		0.101	
1752	190	4	37	4.9	1030.6	0.614	-30.63	1000.1		0.074	
1753	190	4	37	11.9	1039.9	0.950	-32.15	1009.2		0.070	
1754	190	4	37	11.9	1041.8	1.011	-32.15	1011.0		0.070	
1755	190	4	37	15.3	1075.1	1.504	-31.89	1043.5		0.070	
1756	190	4	37	19.3	1670.5	0.649	-25.99	1625.1		0.088	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1757	190	4	39	5.3	1046.0	-1.468	-5.93	1015.1		0.570	
1758	190	4	39	37.5	839.4	-1.394	-39.99	813.9		0.052	
1759	190	4	40	20.5	1025.9	-1.171	-31.49	995.5		0.072	
1760	190	4	40	53.7	1034.6	0.765	-42.09	1004.0		0.048	
1761	190	4	41	13.3	1516.9	-1.438	-37.86	1474.8		0.056	
1762	190	4	41	21.1	1257.9	1.271	-35.08	1221.8		0.062	
1763	190	4	45	10.3	1442.5	-1.446	-27.20	1402.2		0.084	
1764	190	4	45	11.3	1441.1	-1.397	-29.09	1400.7		0.078	
1765	190	4	45	14.5	816.8	0.722	-18.02	791.9		0.142	
1766	190	4	45	29.3	671.2	0.732	-49.81	650.3		0.035	
1767	190	4	45	57.1	763.2	-1.306	-25.52	739.7		0.090	
1768	190	4	47	12.5	1521.1	-1.067	-35.71	1479.0		0.061	
1769	190	4	47	29.9	904.5	-0.973	-45.17	877.3		0.042	
1770	190	4	50	34.9	611.9	0.837	-50.25	592.6		0.035	
1771	190	4	51	4.5	1473.3	-1.542	-11.53	1432.2		0.299	
1772	190	4	51	48.9	669.6	0.961	-49.59	648.7		0.036	
1773	190	4	52	33.5	1123.4	1.228	-25.78	1090.6		0.089	
1774	190	4	53	53.7	785.7	-1.292	-47.69	761.7		0.038	
1775	190	4	54	24.1	805.4	0.646	-46.36	780.8		0.040	
1776	190	4	55	14.5	1661.7	0.298	-28.46	1616.5		0.080	
1777	190	4	55	40.3	1601.3	-1.605	-12.73	1557.3		0.261	
1778	190	4	56	41.3	1017.5	1.193	5.33	987.4		2.083	
1779	190	4	57	3.1	1462.2	1.145	-3.55	1421.4		0.750	
1780	190	4	57	22.3	849.1	-0.977	-46.69	823.3		0.040	
1781	190	4	58	18.9	1117.4	-1.198	-42.04	1084.7		0.048	
1782	190	4	58	50.1	1747.4	-1.150	-31.23	1700.4		0.072	
1783	190	5	0	22.5	1510.3	-1.273	-33.50	1468.4		0.066	
1784	190	5	1	47.7	1538.9	-0.894	-32.08	1496.4		0.070	
1785	190	5	3	25.9	1131.3	-1.482	-25.41	1098.3		0.090	
1786	190	5	3	52.1	668.4	-1.050	-30.31	647.6		0.075	
1787	190	5	4	44.9	995.0	-1.158	-36.85	965.5		0.058	
1788	190	5	5	18.1	1476.6	-1.332	-35.16	1435.5		0.062	
1789	190	5	12	14.1	675.2	1.075	-26.74	654.1		0.086	
1790	190	5	13	40.9	1125.7	-1.185	-23.33	1092.9		0.098	
1791	190	5	16	57.3	2189.1	0.445	-24.33	2133.2		0.094	
1792	190	5	17	21.9	1048.1	-1.118	-32.34	1017.2		0.069	
1793	190	5	17	42.3	1672.9	-1.391	-22.08	1627.5		0.103	
1794	190	5	18	44.5	1082.1	-1.493	-34.95	1050.3		0.063	
1795	190	5	19	48.7	2056.5	-1.272	-28.05	2003.2		0.082	
1796	190	5	20	35.1	1926.1	-1.021	-30.17	1875.3		0.075	
1797	190	5	22	43.5	1604.9	-1.310	-25.58	1560.9		0.090	
1798	190	5	23	21.3	917.1	0.771	-41.60	889.6		0.049	
1799	190	5	25	3.7	622.9	-0.070	-53.77	603.4		0.030	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1800	190	5	25	35.1	1807.1	-1.306	-15.85	1758.8		0.182	
1801	190	5	26	2.5	1004.4	-0.753	-40.14	974.6		0.051	
1802	190	5	27	0.3	1143.2	-1.243	-27.66	1109.9		0.083	
1803	190	5	28	13.7	869.1	-1.542	-30.63	842.8		0.074	
1804	190	5	28	59.1	980.2	1.154	-31.34	951.0		0.072	
1805	190	5	30	38.3	1883.2	0.455	-19.52	1833.4		0.119	
1806	190	5	31	15.3	1895.1	1.576	-28.66	1845.0		0.080	
1807	190	5	33	20.3	594.3	-1.465	-8.09	575.5		0.445	
1808	190	5	36	1.7	829.3	-1.012	-22.67	804.1		0.100	
1809	190	5	36	31.5	1029.1	-1.120	-12.13	998.7		0.279	
1810	190	5	37	30.7	767.0	0.918	-35.25	743.4		0.062	
1811	190	5	40	52.3	1346.0	-1.613	-38.90	1307.9		0.054	
1812	190	5	41	6.3	1028.2	1.180	2.18	997.7		1.450	
1813	190	5	41	20.9	966.6	0.303	-24.11	937.7		0.095	
1814	190	5	44	20.1	563.7	1.463	-36.23	545.8		0.060	
1815	190	5	44	38.5	984.7	0.654	-32.38	955.3		0.069	
1816	190	5	46	2.5	518.4	1.301	-48.10	501.8		0.038	
1817	190	5	47	13.5	1125.0	-1.173	-32.68	1092.2		0.068	
1818	190	5	47	35.9	1394.1	-1.308	-31.13	1354.8		0.073	
1819	190	5	47	43.7	949.3	1.234	-43.09	920.9		0.046	
1820	190	5	47	48.9	989.3	1.257	-43.04	959.9		0.046	
1821	190	5	48	51.3	673.2	1.252	-24.17	652.3		0.095	
1822	190	5	50	43.9	467.5	1.224	-28.59	452.4		0.080	
1823	190	5	51	5.9	581.8	1.208	-31.63	563.4		0.071	
1824	190	5	51	22.1	1058.9	1.326	-23.95	1027.7		0.096	
1825	190	5	51	28.9	1089.1	-1.513	-23.95	1057.2		0.096	
1826	190	5	51	38.7	484.8	1.226	-40.76	469.2		0.050	
1827	190	5	51	55.9	519.8	1.273	-34.13	503.2		0.065	
1828	190	5	52	43.7	1566.1	0.504	-31.52	1523.0		0.071	
1829	190	5	53	32.5	497.3	1.235	-27.45	481.4		0.084	
1830	190	5	53	44.7	982.6	0.808	-39.59	953.3		0.052	
1831	190	5	53	53.5	629.6	1.228	-44.74	609.9		0.043	
1832	190	5	54	18.7	886.5	-1.085	-36.23	859.7		0.060	
1833	190	5	55	4.1	1020.5	0.555	-42.98	990.2		0.046	
1834	190	5	55	15.1	1533.4	-1.344	-21.40	1491.0		0.105	
1835	190	5	55	19.9	973.3	0.813	-35.50	944.3		0.061	
1836	190	5	55	20.3	1526.8	-1.207	-23.89	1484.6		0.096	
1837	190	5	55	23.3	625.2	1.161	-51.48	605.6		0.033	
1838	190	5	55	30.3	1516.4	-0.958	-35.20	1474.3		0.062	
1839	190	5	56	3.1	988.6	0.794	-44.92	959.2		0.043	
1840	190	5	56	34.7	988.3	0.804	-37.44	958.9		0.057	
1841	190	5	56	40.5	1016.8	0.580	-35.67	986.7		0.061	
1842	190	5	57	53.7	619.1	1.134	-44.92	599.6		0.043	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1843	190	5	58	19.5	489.3	1.191	-29.83	473.6		0.076	
1844	190	5	59	48.5	705.9	0.439	-50.86	684.0		0.034	
1845	190	6	2	0.3	1239.3	-1.076	-41.50	1203.7		0.049	
1846	190	6	2	7.5	1167.5	-0.232	-37.21	1133.6		0.057	
1847	190	6	3	6.5	876.8	-1.174	-33.61	850.3		0.066	
1848	190	6	3	38.5	997.8	1.172	-41.66	968.2		0.048	
1849	190	6	4	16.7	998.6	1.198	2.01	968.9		1.423	
1850	190	6	5	31.3	1137.8	-1.251	-24.69	1104.6		0.093	
1851	190	6	5	42.5	635.3	-1.434	-37.30	615.4		0.057	
1852	190	6	7	21.3	1446.6	1.137	-6.96	1406.1		0.506	
1853	190	6	8	13.7	713.3	-1.018	-44.86	691.3		0.043	
1854	190	6	8	44.9	740.2	-1.278	-48.24	717.4		0.038	
1855	190	6	9	53.3	934.9	-0.881	-44.02	906.9		0.044	
1856	190	6	10	9.9	892.4	-1.040	-26.77	865.5		0.086	
1857	190	6	10	53.3	1440.6	-1.313	-34.09	1400.3		0.065	
1858	190	6	11	37.1	674.8	-1.594	-26.56	653.8		0.086	
1859	190	6	11	41.5	1132.8	-1.459	-37.03	1099.7		0.058	
1860	190	6	12	11.9	369.2	0.201	-51.48	357.2		0.033	
1861	190	6	15	1.1	887.9	-0.935	-42.92	861.1		0.046	
1862	190	6	15	15.7	1477.5	-1.465	-37.90	1436.3		0.056	
1863	190	6	16	10.3	884.1	-1.117	-46.49	857.4		0.040	
1864	190	6	17	9.5	860.9	-1.345	-19.11	834.8		0.125	
1865	190	6	17	40.1	1167.4	-1.285	-37.81	1133.5		0.056	
1866	190	6	19	31.5	1229.9	0.784	-15.85	1194.5		0.182	
1867	190	6	20	4.7	786.9	1.412	-36.67	762.9		0.059	
1868	190	6	20	17.7	1231.4	-1.534	-41.50	1195.9		0.049	
1869	190	6	22	17.5	1461.5	-1.442	-30.88	1420.7		0.073	
1870	190	6	23	36.9	716.4	-1.364	-21.98	694.2		0.103	
1871	190	6	24	14.9	717.1	-1.111	-29.19	694.9		0.078	
1872	190	6	24	41.3	908.3	-1.556	-26.59	881.0		0.086	
1873	190	6	24	50.3	1346.4	-0.558	-29.19	1308.3		0.078	
1874	190	6	24	54.7	844.2	1.148	-23.86	818.6		0.096	
1875	190	6	25	39.1	1678.9	-1.497	-14.99	1633.3		0.201	
1876	190	6	26	49.9	575.0	0.177	-51.17	556.8		0.034	
1877	190	6	27	25.5	602.8	2.004	-49.44	583.9		0.036	
1878	190	6	27	57.1	2086.8	-1.425	-27.85	2032.9		0.082	
1879	190	6	28	12.7	460.7	1.443	-6.40	445.8		0.540	
1880	190	6	30	3.5	951.7	-0.983	-23.06	923.2		0.099	
1881	190	6	30	35.9	1499.3	-1.413	-38.28	1457.6		0.055	
1882	190	6	31	5.1	1133.5	-1.199	-33.50	1100.5		0.066	
1883	190	6	32	34.9	1444.1	-1.445	-27.57	1403.7		0.083	
1884	190	6	32	39.9	896.1	-1.005	-41.82	869.1		0.048	
1885	190	6	35	7.9	977.4	0.300	-44.62	948.3		0.043	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1886	190	6	36	29.5	487.5	0.216	-49.73	471.9		0.036	
1887	190	6	38	40.1	757.1	-1.565	-40.60	733.8		0.050	
1888	190	6	40	49.5	1567.8	-1.516	-23.03	1524.6		0.099	
1889	190	6	40	53.1	831.7	-1.038	-34.62	806.4		0.063	
1890	190	6	41	13.1	580.1	1.456	-41.18	561.8		0.049	
1891	190	6	41	18.7	949.8	-1.692	-46.75	921.4		0.040	
1892	190	6	41	25.3	835.4	-1.111	-28.63	810.0		0.080	
1893	190	6	42	40.1	641.2	0.953	-2.20	621.1		0.876	
1894	190	6	42	59.3	1528.1	-1.709	-28.86	1485.8		0.079	
1895	190	6	43	39.7	1529.1	-1.426	-26.32	1486.8		0.087	
1896	190	6	45	58.1	393.0	-1.353	-32.64	380.2		0.068	
1897	190	6	47	37.7	679.3	-0.017	-44.98	658.1		0.043	
1898	190	6	48	9.5	1495.0	1.101	-29.69	1453.5		0.077	
1899	190	6	48	54.3	821.1	0.776	-35.50	796.1		0.061	
1900	190	6	49	6.3	1546.7	-1.234	-30.73	1504.0		0.074	
1901	190	6	50	50.9	854.0	-1.110	-13.64	828.1		0.235	
1902	190	6	51	20.9	886.3	-0.359	-44.98	859.6		0.043	
1903	190	6	52	23.3	1719.6	-1.716	-34.54	1673.1		0.064	
1904	190	6	52	42.5	574.1	1.025	-25.49	555.9		0.090	
1905	190	6	55	50.7	578.4	1.097	-49.59	560.1		0.036	
1906	190	6	56	26.7	1457.7	1.156	-4.18	1416.9		0.697	
1907	190	6	56	46.9	864.1	-1.131	-6.85	837.9		0.513	
1908	190	6	58	1.5	952.9	0.736	-18.65	924.4		0.132	
1909	190	6	58	5.9	955.8	0.967	-42.59	927.2		0.047	
1910	190	6	58	32.9	1532.6	-1.486	-14.09	1490.2		0.223	
1911	190	7	0	10.5	1462.8	-1.241	-26.20	1422.0		0.088	
1912	190	7	0	45.5	1366.1	-1.426	-36.14	1327.5		0.060	
1913	190	7	1	0.7	1062.8	-1.235	-36.58	1031.5		0.059	
1914	190	7	1	54.1	772.0	-1.073	-48.80	748.3		0.037	
1915	190	7	2	21.5	1198.9	-1.537	-16.62	1164.3		0.167	
1916	190	7	2	49.7	1519.4	-1.347	2.90	1477.3		1.576	
1917	190	7	4	17.5	1002.6	0.721	1.22	972.8		1.298	
1918	190	7	4	40.7	1512.7	1.246	-28.11	1470.7		0.081	
1919	190	7	6	34.3	671.1	1.258	2.80	650.2		1.558	
1920	190	7	6	56.7	1123.8	-1.565	-29.36	1091.0		0.078	
1921	190	7	8	0.1	1143.7	-1.434	-19.55	1110.4		0.119	
1922	190	7	8	1.9	636.3	-1.013	2.52	616.3		1.508	
1923	190	7	8	9.7	1508.2	-1.337	-29.52	1466.3		0.077	
1924	190	7	8	30.5	1574.7	-1.370	-18.86	1531.4		0.129	
1925	190	7	10	2.9	752.4	0.681	-33.50	729.2		0.066	
1926	190	7	14	30.3	1402.1	-1.609	-24.98	1362.7		0.092	
1927	190	7	14	40.9	906.8	-0.964	-41.60	879.6		0.049	
1928	190	7	16	58.7	1054.5	1.139	9.11	1023.4		3.222	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1929	190	7	17	3.5	1060.4	1.338	-22.15	1029.2		0.102	
1930	190	7	17	4.1	1410.2	-1.568	-24.36	1370.6		0.094	
1931	190	7	17	31.5	826.5	-1.469	-6.79	801.4		0.516	
1932	190	7	17	45.3	853.6	-1.123	-45.60	827.7		0.042	
1933	190	7	18	6.1	1465.0	1.292	-29.49	1424.1		0.077	
1934	190	7	18	16.5	941.0	-1.074	-29.63	912.8		0.077	
1935	190	7	18	20.3	625.7	-1.211	-28.96	606.1		0.079	
1936	190	7	18	33.9	963.0	0.152	-24.47	934.2		0.094	
1937	190	7	18	36.9	1590.7	-1.404	-35.29	1547.1		0.062	
1938	190	7	19	4.7	920.2	-1.135	-38.71	892.6		0.054	
1939	190	7	19	50.5	1497.0	1.139	-3.05	1455.4		0.795	
1940	190	7	19	56.9	1894.6	-1.665	-24.11	1844.5		0.095	
1941	190	7	19	58.3	1892.3	-1.638	-24.33	1842.2		0.094	
1942	190	7	19	58.9	742.7	-0.882	-42.26	719.8		0.047	
1943	190	7	20	25.3	802.7	-1.153	-39.44	778.2		0.053	
1944	190	7	20	46.1	1085.4	-1.529	-37.49	1053.6		0.057	
1945	190	7	20	50.7	757.9	-1.095	-15.05	734.6		0.199	
1946	190	7	21	8.1	870.5	-1.091	-39.05	844.2		0.054	
1947	190	7	21	57.5	878.4	-1.126	1.66	851.8		1.366	
1948	190	7	22	22.7	831.7	-1.455	-8.14	806.4		0.442	
1949	190	7	22	41.7	848.5	-1.445	-44.26	822.8		0.044	
1950	190	7	23	30.5	1451.4	1.051	-32.83	1410.8		0.068	
1951	190	7	24	6.1	1536.2	-1.440	-30.49	1493.7		0.074	
1952	190	7	25	2.7	1650.4	-1.434	-32.34	1605.4		0.069	
1953	190	7	25	24.9	862.5	-1.066	-22.88	836.4		0.100	
1954	190	7	27	57.3	1109.2	0.518	-39.29	1076.7		0.053	
1955	190	7	29	12.9	862.4	-1.093	-11.86	836.2		0.288	
1956	190	7	30	46.7	1553.8	-1.405	-28.17	1511.0		0.081	
1957	190	7	30	49.3	992.8	1.246	-39.29	963.2		0.053	
1958	190	7	31	21.1	728.6	-1.018	-48.73	706.1		0.037	
1959	190	7	32	6.7	1014.7	-0.769	-37.35	984.7		0.057	
1960	190	7	32	19.7	1598.3	-1.706	-36.67	1554.4		0.059	
1961	190	7	35	56.9	1459.5	1.288	-27.51	1418.7		0.083	
1962	190	7	36	3.3	662.1	1.416	-47.35	641.4		0.039	
1963	190	7	36	25.7	1463.6	-1.630	-18.85	1422.7		0.129	
1964	190	7	36	50.9	1022.0	-1.138	-27.57	991.7		0.083	
1965	190	7	37	4.9	1380.7	-1.448	-23.92	1341.7		0.096	
1966	190	7	37	7.1	866.7	-1.038	-32.42	840.4		0.069	
1967	190	7	38	42.7	781.9	1.098	-36.67	758.0		0.059	
1968	190	7	39	16.5	663.7	-1.271	-29.42	643.0		0.077	
1969	190	7	39	50.7	1057.8	-0.962	-30.38	1026.6		0.075	
1970	190	7	39	52.1	788.8	-1.594	-12.03	764.6		0.283	
1971	190	7	40	39.7	789.6	-1.558	-24.67	765.4		0.093	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
1972	190	7	40	44.7	868.8	-1.094	-31.74	842.5		0.071	
1973	190	7	42	20.7	1467.0	1.159	-7.09	1426.1		0.499	
1974	190	7	43	40.1	868.7	-1.108	-44.08	842.4		0.044	
1975	190	7	43	51.7	781.6	-0.959	-40.14	757.7		0.051	
1976	190	7	44	9.9	1037.1	0.836	-25.03	1006.5		0.092	
1977	190	7	45	19.5	915.6	0.741	-19.83	888.1		0.115	
1978	190	7	45	48.5	1387.9	-1.194	-38.61	1348.8		0.054	
1979	190	7	46	5.9	1540.9	-1.358	-32.42	1498.3		0.069	
1980	190	7	46	27.5	1500.4	-1.556	-36.06	1458.7		0.060	
1981	190	7	46	38.1	1469.5	1.138	-2.30	1428.5		0.866	
1982	190	7	48	25.3	1528.6	-1.567	-12.89	1486.3		0.256	
1983	190	7	48	51.7	957.4	-1.552	-33.18	928.8		0.067	
1984	190	7	49	4.5	871.8	-1.073	-30.63	845.4		0.074	
1985	190	7	50	5.5	613.4	1.344	-22.77	594.1		0.100	
1986	190	7	50	55.3	863.1	-1.074	-31.89	836.9		0.070	
1987	190	7	53	41.3	1475.3	1.194	-16.89	1434.2		0.161	
1988	190	7	53	51.9	580.0	-1.063	-34.70	561.7		0.063	
1989	190	7	54	7.7	1470.8	1.162	-12.59	1429.8		0.265	
1990	190	7	55	34.7	788.4	-1.650	-43.96	764.2		0.044	
1991	190	7	55	55.3	1669.4	-0.951	-21.93	1624.0		0.103	
1992	190	7	56	29.5	1767.3	-1.310	-17.27	1719.8		0.155	
1993	190	7	56	54.5	864.0	-1.005	-30.52	837.9		0.074	
1994	190	7	57	56.3	826.1	-1.305	-35.58	800.9		0.061	
1995	190	7	58	11.9	1026.7	0.814	-43.09	996.3		0.046	
1996	190	7	58	26.5	659.6	1.243	-0.88	639.0		1.020	
1997	190	8	1	1.5	912.7	-1.131	-20.24	885.2		0.110	
1998	190	8	4	38.4	997.4	1.183	-42.64	967.8		0.047	
1999	190	8	5	39.0	1163.5	-1.468	-13.73	1129.7		0.232	
2000	190	8	10	16.0	1472.8	-1.332	-33.57	1431.7		0.066	
2001	190	8	10	51.2	2242.0	-0.463	-23.33	2185.1		0.098	
2002	190	8	10	53.8	1457.8	-1.406	2.32	1417.1		1.473	
2003	190	8	14	22.2	1096.2	-1.507	-21.57	1064.0		0.105	
2004	190	8	15	23.4	956.2	-1.161	-27.89	927.6		0.082	
2005	190	8	17	10.8	1523.2	-1.534	-24.72	1481.0		0.093	
2006	190	8	17	34.0	1068.4	-1.109	-19.36	1037.0		0.122	
2007	190	8	17	41.8	746.7	-1.394	-48.80	723.7		0.037	
2008	190	8	17	48.4	1721.3	0.330	-31.31	1674.8		0.072	
2009	190	8	19	28.6	1548.4	-1.478	-33.38	1505.7		0.067	
2010	190	8	20	22.8	1240.1	1.057	-35.71	1204.5		0.061	
2011	190	8	20	43.2	1592.7	-1.440	-32.38	1548.9		0.069	
2012	190	8	21	3.2	1431.5	-1.663	-14.54	1391.4		0.212	
2013	190	8	21	11.6	1561.8	-1.488	-2.83	1518.8		0.815	
2014	190	8	22	14.0	904.2	-1.060	-39.84	877.0		0.052	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2015	190	8	23	12.4	599.7	0.946	-30.91	580.8		0.073	
2016	190	8	25	4.2	1447.2	-1.557	-24.75	1406.7		0.093	
2017	190	8	28	15.6	656.0	-0.998	-42.04	635.5		0.048	
2018	190	8	28	41.4	1465.7	1.126	-5.75	1424.8		0.582	
2019	190	8	30	49.6	1752.1	-1.515	-19.99	1705.0		0.113	
2020	190	8	31	17.2	840.6	-1.115	-43.50	815.1		0.045	
2021	190	8	36	52.8	1569.3	-0.991	-34.50	1526.1		0.064	
2022	190	8	39	26.0	1470.7	1.127	-32.80	1429.7		0.068	
2023	190	8	39	52.6	1019.4	1.218	-15.69	989.2		0.185	
2024	190	8	41	6.4	1532.9	-1.526	-1.33	1490.5		0.968	
2025	190	8	42	31.0	1266.5	-1.270	-35.08	1230.2		0.062	
2026	190	8	43	49.8	1546.9	-1.432	-37.26	1504.2		0.057	
2027	190	8	44	39.4	724.2	-1.753	-22.69	701.9		0.100	
2028	190	8	44	55.6	1280.7	-1.457	-34.74	1244.1		0.063	
2029	190	8	46	44.4	1934.3	-1.817	-32.83	1883.4		0.068	
2030	190	8	49	13.4	1364.2	-1.489	-28.11	1325.6		0.081	
2031	190	8	49	48.4	1042.0	1.188	-37.44	1011.2		0.057	
2032	190	8	50	32.6	1051.9	0.721	-6.51	1020.9		0.533	
2033	190	8	50	45.2	1430.9	0.709	-31.82	1390.8		0.071	
2034	190	8	50	45.2	1430.9	0.708	-31.82	1390.8		0.071	
2035	190	8	50	48.2	706.1	-0.896	-10.47	684.3		0.338	
2036	190	8	51	19.0	1455.8	-1.580	-30.98	1415.1		0.073	
2037	190	8	51	54.6	1534.3	-1.490	-15.62	1491.9		0.187	
2038	190	8	52	4.0	906.4	1.390	-32.42	879.1		0.069	
2039	190	8	53	18.4	1064.4	-1.095	8.55	1033.1		3.019	
2040	190	8	53	29.2	1053.9	-0.610	-42.42	1022.8		0.047	
2041	190	8	53	30.0	745.5	-0.665	-48.10	722.5		0.038	
2042	190	8	53	30.0	745.1	-0.676	-48.10	722.2		0.038	
2043	190	8	55	53.0	1515.7	-1.506	-5.77	1473.7		0.581	
2044	190	8	55	53.8	928.2	-1.565	-20.06	900.4		0.112	
2045	190	8	55	54.2	1513.9	-1.483	-9.76	1472.0		0.367	
2046	190	8	55	57.8	922.1	-1.345	-45.35	894.5		0.042	
2047	190	8	56	0.2	1505.6	-1.319	-26.26	1463.8		0.087	
2048	190	8	58	26.0	1109.7	-1.291	-32.83	1077.3		0.068	
2049	190	8	58	45.8	1037.2	1.125	-17.69	1006.5		0.147	
2050	190	8	58	54.4	1389.9	-1.127	-15.93	1350.7		0.180	
2051	190	8	59	1.8	1412.0	-1.659	-35.25	1372.4		0.062	
2052	190	8	59	46.8	929.0	-0.741	-38.47	901.1		0.055	
2053	190	9	1	23.8	843.2	-1.249	-30.49	817.6		0.074	
2054	190	9	2	44.6	914.8	1.316	-16.80	887.3		0.163	
2055	190	9	2	48.4	1553.8	-1.560	-27.70	1511.0		0.083	
2056	190	9	2	49.6	1552.0	-1.532	-27.63	1509.1		0.083	
2057	190	9	3	8.6	1519.4	-1.351	-36.85	1477.3		0.058	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2058	190	9	3	24.0	1042.6	0.710	-37.12	1011.8		0.058	
2059	190	9	5	2.6	768.5	0.685	-44.86	744.9		0.043	
2060	190	9	5	16.8	641.5	-0.947	-47.35	621.4		0.039	
2061	190	9	6	38.0	607.8	-1.246	-45.54	588.7		0.042	
2062	190	9	7	32.4	693.7	-0.243	-36.58	672.1		0.059	
2063	190	9	9	5.0	1895.2	-0.951	-25.87	1845.0		0.089	
2064	190	9	9	24.0	990.5	1.240	-12.40	961.1		0.271	
2065	190	9	9	34.4	794.8	-1.649	-45.79	770.5		0.041	
2066	190	9	10	15.8	632.9	-0.362	-49.08	613.0		0.036	
2067	190	9	12	37.0	941.3	0.452	-35.93	913.1		0.060	
2068	190	9	13	34.0	946.0	-1.146	8.47	917.7		2.993	
2069	190	9	15	26.4	1082.3	0.046	-40.86	1050.5		0.050	
2070	190	9	15	55.4	957.4	2.147	-41.33	928.8		0.049	
2071	190	9	16	11.8	698.0	-1.292	-49.95	676.4		0.035	
2072	190	9	16	40.8	1253.2	-1.264	-40.50	1217.2		0.051	
2073	190	9	18	56.4	1057.0	-1.231	-34.58	1025.9		0.064	
2074	190	9	21	34.8	854.0	-1.176	-30.56	828.1		0.074	
2075	190	9	21	46.0	995.7	-1.514	-21.88	966.1		0.103	
2076	190	9	21	49.0	1254.4	-1.513	-27.54	1218.5		0.083	
2077	190	9	22	36.0	537.7	1.144	-17.52	520.6		0.150	
2078	190	9	24	43.6	628.5	-0.747	-49.51	608.8		0.036	
2079	190	9	24	54.4	1001.4	0.724	2.88	971.7		1.571	
2080	190	9	25	19.6	946.3	0.932	-45.10	918.0		0.042	
2081	190	9	25	53.6	846.1	-1.756	-45.85	820.4		0.041	
2082	190	9	26	6.2	1070.8	1.088	-28.11	1039.3		0.081	
2083	190	9	26	15.8	979.5	0.890	-40.97	950.3		0.050	
2084	190	9	26	44.4	1455.6	1.006	-18.46	1414.9		0.135	
2085	190	9	27	13.8	1018.8	-1.234	-42.53	988.6		0.047	
2086	190	9	27	14.8	745.1	-1.110	-34.54	722.2		0.064	
2087	190	9	28	19.6	867.3	-1.043	-40.55	841.1		0.051	
2088	190	9	28	48.4	1117.4	-1.467	-26.80	1084.8		0.086	
2089	190	9	29	27.6	1153.1	0.262	-14.63	1119.5		0.209	
2090	190	9	29	59.2	1420.5	-1.612	-30.28	1380.6		0.075	
2091	190	9	31	47.6	898.6	-1.110	-31.20	871.6		0.072	
2092	190	9	32	45.2	977.7	1.213	5.01	948.6		2.009	
2093	190	9	33	15.2	1139.6	-1.603	-19.29	1106.4		0.123	
2094	190	9	35	2.0	568.8	0.824	-38.14	550.8		0.055	
2095	190	9	36	5.6	1430.0	-1.094	-21.45	1389.9		0.105	
2096	190	9	36	53.0	603.8	-1.395	12.27	584.8		4.634	
2097	190	9	37	36.8	758.1	-1.135	-34.87	734.8		0.063	
2098	190	9	40	10.8	988.5	0.975	-43.15	959.1		0.046	
2099	190	9	40	21.4	1060.9	-0.893	-20.06	1029.6		0.112	
2100	190	9	40	52.4	1027.1	-0.972	-40.09	996.8		0.051	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2101	190	9	44	29.0	856.6	-1.096	-21.57	830.6		0.105	
2102	190	9	44	47.0	1116.2	-1.510	-19.80	1083.6		0.115	
2103	190	9	46	7.2	673.7	1.174	-7.35	652.7		0.484	
2104	190	9	46	8.6	869.1	0.780	-15.07	842.8		0.199	
2105	190	9	46	10.4	677.0	1.516	-37.86	655.9		0.056	
2106	190	9	46	22.6	1037.9	0.673	-18.53	1007.3		0.134	
2107	190	9	47	9.0	995.7	1.228	-11.54	966.1		0.299	
2108	190	9	47	17.6	811.3	-1.055	-42.48	786.6		0.047	
2109	190	9	47	24.4	1043.1	0.584	-41.44	1012.3		0.049	
2110	190	9	47	36.0	801.1	-1.102	-30.31	776.6		0.075	
2111	190	9	47	50.4	978.7	-1.049	-25.18	949.6		0.091	
2112	190	9	49	45.8	600.1	-0.755	-42.92	581.2		0.046	
2113	190	9	50	41.4	885.7	-1.128	-19.57	859.0		0.119	
2114	190	9	51	21.2	667.0	1.406	-31.34	646.2		0.072	
2115	190	9	52	9.0	886.9	-1.593	-45.79	860.1		0.041	
2116	190	9	52	13.6	1494.7	-1.650	-15.94	1453.2		0.180	
2117	190	9	52	16.8	874.9	0.820	-28.56	848.5		0.080	
2118	190	9	52	21.6	1482.4	-1.433	8.16	1441.1		2.885	
2119	190	9	52	53.4	587.0	0.911	-49.44	568.5		0.036	
2120	190	9	53	0.6	994.8	0.741	-44.92	965.2		0.043	
2121	190	9	53	37.4	983.6	0.336	-42.48	954.3		0.047	
2122	190	9	54	49.6	1081.5	-0.338	-25.29	1049.8		0.091	
2123	190	9	55	15.4	2233.4	-1.265	-24.41	2176.7		0.094	
2124	190	9	55	18.6	899.4	-1.075	-42.76	872.3		0.046	
2125	190	9	55	38.0	1040.7	0.585	-19.27	1010.0		0.123	
2126	190	9	56	4.4	865.9	0.709	-36.58	839.7		0.059	
2127	190	9	56	57.4	2372.5	-0.762	-25.78	2313.2		0.089	
2128	190	9	57	9.2	1477.4	-1.244	-30.91	1436.2		0.073	
2129	190	9	57	27.0	1026.7	0.776	-39.89	996.3		0.052	
2130	190	9	57	40.0	1522.0	-1.475	-24.19	1479.9		0.095	
2131	190	9	59	25.8	1406.4	-1.557	-23.70	1366.9		0.096	
2132	190	9	59	47.8	651.9	0.253	-39.84	631.6		0.052	
2133	190	10	2	26.0	1472.1	-1.503	-32.42	1431.1		0.069	
2134	190	10	2	56.8	1462.0	-1.522	-3.33	1421.1		0.769	
2135	190	10	4	4.4	812.6	-1.119	-36.41	787.8		0.059	
2136	190	10	4	10.2	1028.1	0.665	-43.67	997.6		0.045	
2137	190	10	4	14.6	804.2	-0.511	-43.96	779.6		0.044	
2138	190	10	4	27.4	536.3	-2.440	-48.65	519.3		0.037	
2139	190	10	4	42.4	510.4	-0.967	-27.10	494.1		0.085	
2140	190	10	4	42.4	510.4	-0.967	-27.10	494.1		0.085	
2141	190	10	4	43.0	1012.2	0.744	-43.73	982.2		0.045	
2142	190	10	4	50.4	1019.8	1.074	-39.29	989.6		0.053	
2143	190	10	5	49.0	1574.1	-1.119	-28.59	1530.8		0.080	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2144	190	10	6	4.8	1652.7	-1.377	-30.59	1607.7		0.074	
2145	190	10	7	21.2	783.3	0.232	-41.87	759.3		0.048	
2146	190	10	7	41.0	832.1	0.973	-12.12	806.8		0.280	
2147	190	10	8	26.8	639.9	-0.898	-41.18	619.9		0.049	
2148	190	10	10	27.8	1160.1	0.419	-36.19	1126.4		0.060	
2149	190	10	11	52.4	1119.9	-1.654	-15.80	1087.2		0.183	
2150	190	10	12	32.4	705.8	-1.165	-42.64	683.9		0.047	
2151	190	10	13	24.4	1828.2	-1.440	-14.84	1779.5		0.205	
2152	190	10	13	28.0	808.5	-1.416	-36.63	783.8		0.059	
2153	190	10	13	33.8	801.3	-1.038	-23.86	776.9		0.096	
2154	190	10	14	29.6	979.6	1.089	-41.87	950.4		0.048	
2155	190	10	15	12.4	1514.5	-1.569	-28.66	1472.5		0.080	
2156	190	10	15	43.4	845.5	0.232	-43.96	819.8		0.044	
2157	190	10	16	33.2	1581.3	-1.374	-35.12	1537.8		0.062	
2158	190	10	17	22.8	924.8	1.307	-11.68	897.1		0.294	
2159	190	10	17	56.6	639.8	0.873	-49.37	619.8		0.036	
2160	190	10	18	55.8	584.4	-0.737	-49.59	565.9		0.036	
2161	190	10	20	2.4	1604.5	-1.302	-30.73	1560.5		0.074	
2162	190	10	20	11.0	1745.7	-1.053	-21.62	1698.7		0.104	
2163	190	10	20	27.2	1486.6	1.354	-5.67	1445.2		0.587	
2164	190	10	21	56.0	946.1	-1.129	-36.01	917.8		0.060	
2165	190	10	23	50.6	1069.5	-1.249	-31.38	1038.1		0.072	
2166	190	10	24	34.2	975.7	0.833	-29.69	946.6		0.077	
2167	190	10	24	47.0	1597.9	-1.595	-24.98	1554.1		0.092	
2168	190	10	25	5.6	1640.1	-1.444	-22.00	1595.3		0.103	
2169	190	10	25	25.4	1264.1	-1.477	-39.54	1227.9		0.053	
2170	190	10	25	55.4	909.9	0.275	-41.18	882.5		0.049	
2171	190	10	26	16.4	777.5	0.122	-47.69	753.6		0.038	
2172	190	10	27	3.8	705.6	-2.373	-46.82	683.7		0.040	
2173	190	10	27	13.0	1009.1	0.760	-41.66	979.1		0.048	
2174	190	10	27	23.0	672.0	-1.006	3.95	651.1		1.779	
2175	190	10	29	31.8	1004.3	-0.767	-33.93	974.5		0.065	
2176	190	10	29	58.2	650.9	-0.217	-51.01	630.5		0.034	
2177	190	10	30	5.8	1557.2	-1.501	-16.43	1514.3		0.170	
2178	190	10	30	9.6	1778.4	-1.671	-21.01	1730.7		0.107	
2179	190	10	30	12.0	655.9	0.892	-39.05	635.4		0.054	
2180	190	10	30	14.0	807.3	-1.049	-43.04	782.6		0.046	
2181	190	10	30	18.0	662.6	1.333	-45.54	641.9		0.042	
2182	190	10	31	55.2	1224.9	-1.250	-21.48	1189.6		0.105	
2183	190	10	32	8.4	930.3	-1.127	-30.98	902.4		0.073	
2184	190	10	32	48.8	830.9	-1.293	-38.00	805.6		0.056	
2185	190	10	33	33.4	822.2	0.174	-48.58	797.1		0.037	
2186	190	10	35	1.4	893.8	0.007	-39.05	866.9		0.054	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2187	190	10	35	30.4	803.0	-0.543	-29.63	778.4		0.077	
2188	190	10	38	42.8	1020.9	0.680	6.64	990.7		2.423	
2189	190	10	38	56.2	959.4	-0.840	-42.37	930.8		0.047	
2190	190	10	39	14.0	1540.9	-1.345	-36.72	1498.3		0.059	
2191	190	10	40	58.8	1522.4	-1.428	-29.86	1480.3		0.076	
2192	190	10	41	8.8	701.6	-0.942	-32.72	679.9		0.068	
2193	190	10	41	10.6	1507.4	-1.097	-29.42	1465.6		0.077	
2194	190	10	41	31.0	722.3	2.335	-47.96	700.0		0.038	
2195	190	10	42	19.0	1115.1	-1.498	-32.68	1082.5		0.068	
2196	190	10	42	43.0	808.3	0.192	-25.20	783.6		0.091	
2197	190	10	44	37.6	869.7	0.545	-30.59	843.4		0.074	
2198	190	10	45	29.2	833.9	1.068	-40.55	808.6		0.051	
2199	190	10	46	59.2	1022.8	0.662	13.75	992.5		5.493	
2200	190	10	49	36.0	736.1	0.269	-22.15	713.4		0.102	
2201	190	10	50	0.8	883.7	1.127	-32.53	857.0		0.069	
2202	190	10	50	19.8	842.6	-1.397	-3.06	817.0		0.793	
2203	190	10	50	48.2	1703.0	0.615	-34.99	1656.9		0.063	
2204	190	10	51	27.4	1030.1	-1.544	-19.57	999.6		0.119	
2205	190	10	51	38.4	513.7	-0.878	-33.26	497.3		0.067	
2206	190	10	51	44.4	1505.3	-1.384	-32.45	1463.5		0.069	
2207	190	10	52	11.2	1651.9	-1.334	-11.29	1606.9		0.308	
2208	190	10	52	22.4	1588.5	-1.327	-12.24	1544.8		0.276	
2209	190	10	53	54.8	742.0	-1.164	-25.96	719.1		0.088	
2210	190	10	54	9.6	1026.5	0.737	-37.35	996.1		0.057	
2211	190	10	54	33.2	1369.5	-1.418	-10.78	1330.8		0.326	
2212	190	10	54	51.4	843.3	-1.444	-37.30	817.7		0.057	
2213	190	10	55	36.0	1477.1	-1.227	-35.67	1435.9		0.061	
2214	190	10	55	57.6	1621.1	-1.302	-28.79	1576.7		0.079	
2215	190	10	56	18.6	781.9	-1.104	-40.39	757.9		0.051	
2216	190	10	56	26.6	736.4	-1.622	-40.29	713.7		0.051	
2217	190	11	0	8.2	1059.4	1.090	-7.15	1028.2		0.495	
2218	190	11	0	49.2	603.7	-1.006	-20.50	584.7		0.109	
2219	190	11	1	13.8	798.2	0.902	-48.24	773.8		0.038	
2220	190	11	1	22.2	1566.6	-1.311	-29.32	1523.4		0.078	
2221	190	11	1	56.8	985.4	-0.713	-37.58	956.0		0.057	
2222	190	11	3	47.4	946.9	-1.241	-33.97	918.6		0.065	
2223	190	11	4	41.2	1579.2	-1.414	-27.92	1535.7		0.082	
2224	190	11	6	53.0	1567.6	-1.347	-22.38	1524.4		0.101	
2225	190	11	7	29.4	1229.3	-1.433	-18.53	1193.9		0.134	
2226	190	11	7	53.8	930.1	-0.222	-42.81	902.2		0.046	
2227	190	11	8	50.2	933.4	-1.942	-36.14	905.4		0.060	
2228	190	11	10	5.4	1577.4	-1.456	-23.49	1534.0		0.097	
2229	190	11	10	34.4	1859.9	-1.175	-30.28	1810.5		0.075	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2230	190	11	11	53.6	527.9	-1.055	-26.95	511.1		0.085	
2231	190	11	12	24.0	517.2	1.193	-41.50	500.7		0.049	
2232	190	11	12	58.8	1613.3	-1.259	-29.22	1569.1		0.078	
2233	190	11	13	9.6	1568.2	-1.360	-30.52	1525.1		0.074	
2234	190	11	14	19.6	1553.9	-1.402	-18.09	1511.0		0.141	
2235	190	11	14	29.0	1583.2	-1.447	-33.10	1539.6		0.067	
2236	190	11	15	1.8	808.7	-0.669	-42.37	784.1		0.047	
2237	190	11	15	24.0	840.9	-1.506	-26.89	815.3		0.085	
2238	190	11	27	23.6	758.6	-1.527	-44.74	735.2		0.043	
2239	190	11	28	2.6	423.3	0.214	-47.02	409.5		0.039	
2240	190	11	28	5.2	946.1	-1.280	-29.86	917.7		0.076	
2241	190	11	28	8.8	1076.5	0.810	-39.29	1044.8		0.053	
2242	190	11	28	13.2	433.7	1.498	-48.58	419.7		0.037	
2243	190	11	28	14.2	435.2	1.700	-52.52	421.1		0.032	
2244	190	11	28	15.0	1592.1	-1.562	-32.23	1548.4		0.070	
2245	190	11	28	23.2	1580.0	-1.360	4.96	1536.5		1.998	
2246	190	11	28	58.8	1446.1	-1.816	-37.58	1405.6		0.057	
2247	190	11	29	5.8	1035.6	0.391	-39.05	1005.0		0.054	
2248	190	11	29	14.0	688.1	-1.867	-49.30	666.7		0.036	
2249	190	11	29	19.2	974.1	-0.789	-33.34	945.0		0.067	
2250	190	11	29	22.4	675.1	-1.271	-15.97	654.1		0.180	
2251	190	11	31	51.4	558.0	-1.084	-25.78	540.3		0.089	
2252	190	11	32	13.8	1656.9	-1.284	-31.71	1611.8		0.071	
2253	190	11	32	47.6	746.7	-0.338	-47.48	723.7		0.039	
2254	190	11	32	54.8	1500.0	-1.451	-27.04	1458.3		0.085	
2255	190	11	33	35.6	1327.5	1.521	2.39	1289.8		1.486	
2256	190	11	34	19.0	1213.4	-1.243	-24.92	1178.4		0.092	
2257	190	11	34	44.8	840.8	-0.308	-41.02	815.2		0.050	
2258	190	11	34	45.6	763.1	0.889	-29.83	739.7		0.076	
2259	190	11	35	14.6	1498.4	-1.510	-23.27	1456.8		0.098	
2260	190	11	35	17.8	1558.7	-1.458	-35.16	1515.7		0.062	
2261	190	11	36	8.4	450.1	1.284	-34.95	435.5		0.063	
2262	190	11	36	20.8	474.6	2.626	-46.95	459.4		0.040	
2263	190	11	36	46.4	1468.2	-1.426	-20.79	1427.3		0.108	
2264	190	11	37	7.4	1578.7	-1.364	-31.20	1535.3		0.072	
2265	190	11	37	43.8	1484.1	-1.422	-28.43	1442.7		0.080	
2266	190	11	37	57.8	1544.8	-1.314	-19.47	1502.1		0.120	
2267	190	11	38	29.8	2364.6	0.740	-0.35	2305.5		1.084	
2268	190	11	38	47.6	1302.0	0.838	-34.05	1264.9		0.065	

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Table D-2. Detections observed by the EISCAT radar using the match function method (FMF) during the 2006 campaign. - Cont.

fmf	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Doppler Inclination	Characteristic Length	Possible Correlation
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)	(m)	US SSN #
2269	190	11	40	6.8	1531.2	-1.298	-19.67	1488.8		0.117	
2270	190	11	40	26.8	892.7	-1.323	-26.08	865.8		0.088	
2271	190	11	41	52.2	1048.0	1.083	-21.11	1017.1		0.107	
2272	190	11	41	59.4	1584.5	-1.367	-27.35	1541.0		0.084	
2273	190	11	43	49.2	1552.2	-1.402	-23.22	1509.4		0.098	
2274	190	11	44	4.8	1427.9	-0.841	-25.23	1387.9		0.091	
2275	190	11	44	15.8	1474.0	-1.329	-28.08	1432.9		0.082	
2276	190	11	45	18.4	734.9	-1.066	-41.66	712.3		0.048	
2277	190	11	45	33.0	1467.3	-1.184	-38.04	1426.3		0.056	
2278	190	11	46	49.6	744.7	1.135	-24.44	721.8		0.094	
2279	190	11	47	39.8	792.9	0.603	-43.44	768.7		0.045	
2280	190	11	48	11.4	1635.8	-1.325	-21.80	1591.2		0.104	
2281	190	11	48	14.2	1093.0	0.255	-2.59	1061.0		0.838	
2282	190	11	48	54.2	977.5	0.759	-37.30	948.4		0.057	
2283	190	11	51	49.0	748.5	-1.357	-48.24	725.4		0.038	
2284	190	11	52	2.4	668.9	-0.776	-41.02	648.0		0.050	
2285	190	11	52	52.2	585.7	1.342	-49.88	567.2		0.035	
2286	190	11	53	9.6	929.3	0.174	-21.15	901.4		0.106	
2287	190	11	54	29.2	863.7	-2.239	-44.98	837.5		0.043	
2288	190	11	54	48.2	830.9	-1.174	-40.39	805.6		0.051	
2289	190	11	55	9.0	1024.0	-0.068	-44.44	993.7		0.044	
2290	190	11	55	17.4	822.5	0.586	-40.65	797.4		0.050	
2291	190	11	55	28.0	1030.0	0.744	7.28	999.5		2.610	
2292	190	11	55	30.4	1656.1	-1.303	-33.30	1611.0		0.067	
2293	190	11	56	18.4	1555.6	-1.224	-28.40	1512.7		0.081	
2294	190	11	57	34.2	868.3	-0.758	-41.18	842.0		0.049	
2295	190	11	58	6.2	1173.2	0.272	4.14	1139.2		1.817	
2296	190	11	59	10.2	921.6	1.359	-26.23	893.9		0.088	
2297	190	11	59	30.0	1533.8	-1.416	-25.70	1491.3		0.089	
2298	190	11	59	48.6	904.8	-1.077	-13.77	877.6		0.231	
2299	190	12	0	21.0	1565.9	-1.371	-34.62	1522.8		0.063	
2300	190	12	1	0.6	1558.4	-1.320	-17.26	1515.4		0.155	
2301	190	12	1	19.4	635.3	-0.257	-46.95	615.4		0.040	
2302	190	12	3	28.4	463.2	0.849	-48.94	448.3		0.037	
2303	190	12	4	10.6	1432.1	-1.519	-35.41	1392.0		0.062	
2304	190	12	5	25.2	1451.3	1.043	-22.03	1410.8		0.103	
2305	190	12	6	2.8	1590.3	-1.494	-19.44	1546.6		0.120	
2306	190	12	6	17.2	917.1	-1.133	-26.98	889.6		0.085	

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Appendix E

COBRA DANE Detection List

Detection List

Table E-1 provides the list of detections observed by the COBRA DANE radar during the 2006 campaign. In order to conserve radar resources for a leak-proof fence, only objects which did not correlate to the USSPACECOM catalog were tracked and recorded.

**Table E-1. Detections observed by the COBRA DANE radar
for the 2006 campaign.**

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
1	240	0	29	29.3	2211.7	-0.391	-19.72	1609.2	102.5	0.025	0.080
2	240	0	36	25.0	798.6	-2.055	-21.85	561.5	98.2	0.010	0.060
3	240	1	11	3.0	1195.3	0.664	-23.85	819.2	99.3	0.004	0.052
4	240	1	11	56.3	1774.8	-3.118	-18.62	1291.4	66.1	0.073	0.104
5	240	1	15	4.3	1441.5	5.213	-20.42	956.1	99.9	0.139	0.071
6	240	1	27	14.3	2255.3	-4.253	-15.99	1682.3	65.4	0.057	0.160
7	240	1	34	3.2	1204.6	-2.304	-17.57	855.6	82.9	0.001	0.123
8	240	1	34	15.3	2201.5	3.609	-16.89	1563.5	101.1	0.007	0.142
9	240	1	36	1.3	1431.6	-0.784	-16.61	1011.9	100.0	0.056	0.149
10	240	1	36	56.2	1442.4	1.172	-16.68	1005.0	99.9	0.055	0.147
11	240	1	39	41.3	1361.0	-1.870	-21.49	969.5	89.8	0.008	0.062
12	240	1	43	58.3	1872.6	4.519	-19.98	1289.7	104.1	0.068	0.077
13	240	1	48	57.3	865.5	-4.519	-20.52	634.9	63.3	0.029	0.070
14	240	1	51	8.3	1547.0	4.782	-20.47	1040.9	102.5	0.084	0.071
15	240	1	59	13.0	1340.7	-3.454	-21.44	972.7	67.9	0.085	0.062
16	240	2	9	42.3	1125.5	2.664	-22.95	752.0	98.1	0.003	0.055
17	240	2	9	45.0	1744.8	-0.317	-20.02	1238.4	82.7	0.027	0.076
18	240	2	21	1.0	1193.9	-3.787	-20.47	864.9	75.7	0.016	0.071
19	240	2	27	4.0	1355.5	-0.517	-19.54	948.7	80.9	0.023	0.084
20	240	2	30	6.3	1706.1	3.694	-19.23	1170.8	99.7	0.052	0.094
21	240	2	30	30.0	822.0	-3.576	-23.49	582.0	57.0	0.277	0.053
22	240	2	34	9.3	1154.6	-4.269	-21.45	844.4	75.8	0.019	0.062
23	240	2	34	26.3	1746.7	-3.567	-17.28	1275.7	66.0	0.030	0.134
24	240	2	36	55.3	2007.6	-3.826	-18.88	1485.0	73.5	0.003	0.100
25	240	2	37	22.0	1677.7	-3.970	-22.09	1232.3	55.7	0.017	0.059
26	240	2	39	20.3	1486.4	-3.823	-13.63	1084.6	82.2	0.035	0.217
27	240	2	40	10.3	1059.4	-2.093	-22.03	752.6	65.9	0.066	0.059
28	240	2	44	37.3	1793.7	3.870	-18.63	1239.8	102.5	0.080	0.103
29	240	2	46	5.3	1090.7	-2.573	-23.87	780.4	70.9	0.001	0.052
30	240	2	47	7.3	1227.6	3.529	-24.97	817.0	82.6	0.006	0.049
31	240	2	52	42.0	2088.3	3.992	-19.34	1466.5	102.1	0.004	0.091
32	240	2	57	3.3	1151.9	2.855	-25.27	772.1	81.2	0.003	0.048
33	240	3	2	25.3	2156.6	4.429	-17.18	1514.5	102.0	0.040	0.136
34	240	3	4	20.3	1391.6	-2.610	-20.02	999.1	83.0	0.003	0.076
35	240	3	8	16.2	1022.8	-3.628	-26.47	741.9	70.1	0.008	0.046
36	240	3	8	16.3	620.2	-4.113	-24.77	459.3	82.1	0.012	0.049

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**Table E-1. Detections observed by the COBRA DANE radar
for the 2006 campaign - Cont.**

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
37	240	3	12	1.0	2319.3	-2.274	-17.69	1715.4	82.1	0.006	0.121
38	240	3	12	17.3	1220.5	-2.863	-20.01	875.5	75.7	0.019	0.076
39	240	3	16	47.0	1287.5	-5.096	-24.68	930.8	56.9	0.285	0.050
40	240	3	17	4.3	1099.5	4.352	-22.67	712.5	100.8	0.004	0.056
41	240	3	21	59.0	2088.2	-3.631	-16.89	1537.6	63.0	0.240	0.142
42	240	3	29	31.0	1221.8	-4.602	-22.27	896.8	70.0	0.001	0.058
43	240	3	30	13.3	532.1	-4.909		400.5			
44	240	3	31	57.3	1419.2	2.445	-18.08	967.3	83.0	0.003	0.115
45	240	3	38	44.0	1330.0	-4.213	-24.78	971.8	65.1	0.006	0.049
46	240	3	48	4.0	1730.4	-1.039	-19.49	1243.4	99.4	0.058	0.084
47	240	3	54	50.0	1973.9	3.102	-18.46	1380.2	101.7	0.006	0.107
48	240	3	56	27.3	1190.6	-3.428	-23.98	856.9	82.6	0.001	0.051
49	240	4	0	18.0	1447.7	-1.749	-24.46	1031.9	90.3	0.022	0.050
50	240	4	4	27.3	1667.0	-4.499	-21.08	1225.8	65.7	0.074	0.065
51	240	4	11	38.3	1001.4	-2.064	-23.66	709.5	98.8	0.001	0.052
52	240	4	13	47.1	1792.5	0.329	-22.46	1272.0	90.1	0.004	0.057
53	240	4	14	40.1	1162.0	3.978	-21.67	765.1	90.2	0.005	0.061
54	240	4	19	48.0	1910.3	0.549	-18.96	1354.5	100.6	0.026	0.099
55	240	4	21	39.3	1138.8	1.263	-26.26	774.2	96.7	0.022	0.046
56	240	4	26	8.3	1667.1	2.627	-23.80	1155.5	83.1	0.014	0.052
57	240	4	26	25.3	1384.5	-1.709	-20.76	985.4	83.2	0.011	0.068
58	240	4	34	58.3	1053.9	-1.750	-22.38	741.2	98.0	0.002	0.057
59	240	4	47	49.0	1577.2	2.917	-21.94	1086.1	99.8	0.012	0.059
60	240	4	50	38.0	973.4	-1.771	-20.43	684.2	98.7	0.003	0.071
61	240	4	53	11.3	2031.3	-2.215	-18.56	1487.4	73.9	0.003	0.105
62	240	4	53	26.3	2017.5	4.115	-16.83	1409.7	101.8	0.008	0.144
63	240	4	54	2.3	1549.9	4.469	-25.17	1044.0	98.0	0.027	0.048
64	240	4	59	54.0	1137.2	4.753	-23.90	740.6	98.1	0.001	0.052
65	240	5	1	12.3	701.2	0.391	-18.78	474.3	82.5	0.006	0.101
66	240	5	5	0.3	1281.7	-0.218	-18.45	891.9	83.0	0.002	0.107
67	240	5	6	39.0	1573.6	2.833	-18.95	1083.7	82.1	0.013	0.099
68	240	5	9	23.3	1314.6	3.959	-22.88	873.5	89.7	0.002	0.055
69	240	5	13	15.0	1193.9	-4.416	-25.23	878.2	64.9	0.002	0.048
70	240	5	14	53.3	1504.1	-4.447	-25.11	1106.5	65.8	0.011	0.049
71	240	5	20	57.3	2012.3	-3.762	-17.30	1489.5	73.7	0.003	0.133
72	240	5	21	59.3	1437.8	-3.812	-21.01	1043.3	82.1	0.024	0.066
73	240	5	22	14.3	1522.4	-2.141	-21.32	1088.8	69.2	0.081	0.063
74	240	5	32	16.3	1389.9	3.892	-21.86	927.2	99.8	0.006	0.060
75	240	5	36	7.0	1472.1	-1.030	-22.68	1043.6	90.1	0.005	0.056
76	240	5	36	53.0	1430.5	-1.378	-22.37	1017.5	89.8	0.012	0.057
77	240	5	37	14.3	2064.5	-4.093	-20.08	1533.3	73.6	0.005	0.076
78	240	5	38	16.3	1405.7	-1.901	-23.56	1006.7	99.2	0.004	0.053
79	240	5	39	42.3	1506.1	-4.422	-18.05	1106.3	66.2	0.018	0.115
80	240	5	41	20.3	695.3	-4.952	-23.81	518.7	62.8	0.086	0.052
81	240	5	44	58.0	1098.0	3.743	-22.27	724.0	82.9	0.004	0.058
82	240	5	53	29.0	1395.4	2.459	-20.15	954.6	89.6	0.001	0.075
83	240	5	56	9.3	1276.2	5.082	-24.91	836.2	98.7	0.001	0.049
84	240	5	57	19.3	804.3	-5.061	-26.83	601.6	57.0	0.278	0.045
85	240	6	5	12.3	1228.2	3.901	-22.92	810.8	99.1	0.011	0.055
86	240	6	7	20.3	1626.9	4.931	-20.91	1098.4	99.5	0.054	0.066

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**Table E-1. Detections observed by the COBRA DANE radar
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NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
87	240	6	13	4.3	1249.7	-3.972	-24.78	909.2	82.6	0.002	0.049
88	240	6	14	28.3	1108.6	-4.256	-23.98	819.1	62.4	0.045	0.051
89	240	6	16	24.3	1377.8	4.990	-24.40	909.3	99.8	0.002	0.050
90	240	6	18	8.3	1887.4	-1.027	-10.96	1357.9	63.2	0.090	0.298
91	240	6	30	19.3	1177.6	-2.039	-19.86	836.3	100.1	0.005	0.078
92	240	6	37	20.0	1252.6	-3.421	-22.64	903.0	82.6	0.001	0.056
93	240	6	39	8.3	1103.5	0.373	-21.86	755.7	82.6	0.006	0.060
94	240	6	42	26.3	1164.0	3.011	-20.71	777.9	98.8	0.003	0.068
95	240	6	49	2.3	1092.8	-3.787	-22.92	798.8	65.7	0.081	0.055
96	240	6	53	38.3	1233.8	-3.612	-24.05	900.2	83.2	0.006	0.051
97	240	6	56	44.0	1302.1	-2.090	-19.24	926.4	82.6	0.002	0.093
98	240	7	3	31.3	829.5	-1.465	-25.27	581.6	98.7	0.001	0.048
99	240	7	8	55.3	1851.8	-2.771	-20.00	1351.1	82.5	0.005	0.077
100	240	7	12	56.3	1407.6	-3.822	-24.24	1029.8	83.1	0.009	0.051
101	240	7	18	13.3	1176.7	-3.919	-19.61	857.9	82.8	0.017	0.082
102	240	7	22	32.3	1082.1	-1.960	-22.26	766.5	71.1	0.009	0.058
103	240	7	24	7.3	1579.5	-1.838	-21.19	1131.9	82.8	0.014	0.064
104	240	7	37	25.3	1201.8	-4.073	-19.62	880.0	56.8	0.107	0.082
105	240	7	38	49.3	1503.4	4.116	-21.24	1017.2	101.8	0.015	0.064
106	240	7	45	28.3	1300.1	-5.017	-22.43	957.4	65.7	0.089	0.057
107	240	7	51	53.3	1591.1	3.403	-21.62	1087.1	82.7	0.042	0.061
108	240	7	56	45.3	1475.5	-1.847	-18.64	1054.8	100.1	0.001	0.103
109	240	8	0	43.3	1103.7	4.559	-25.74	712.3	98.2	0.008	0.047
110	240	8	4	23.0	1202.9	-0.841	-19.18	843.1	99.9	0.002	0.095
111	240	8	5	13.3	1592.3	-2.291	-19.05	1152.7	82.4	0.038	0.098
112	240	8	5	27.3	1235.1	1.806	-21.67	842.4	99.8	0.003	0.061
113	240	8	5	39.2	1516.9	-3.535	-19.78	1106.0	63.4	0.053	0.079
114	240	8	11	37.3	1363.1	3.955	-18.15	906.8	99.2	0.004	0.114
115	240	8	26	20.0	2112.5	4.212	-15.91	1490.8	102.0	0.007	0.162
116	240	8	30	30.0	2326.9	4.177	-16.79	1654.0	102.1	0.015	0.145
117	240	8	32	31.3	1314.5	4.822	-17.46	863.0	98.4	0.034	0.126
118	240	8	37	11.3	2097.7	-2.573	-17.53	1534.2	66.1	0.126	0.124
119	240	8	47	47.0	1436.9	-2.868	-23.84	1044.1	82.9	0.015	0.052
120	240	8	48	13.3	2062.6	3.959	-16.89	1445.0	101.5	0.003	0.142
121	240	8	51	21.3	826.2	0.275	-25.27	561.1	75.7	0.004	0.048
122	240	8	54	42.3	2280.8	3.439	-16.82	1618.0	102.1	0.008	0.144
123	240	8	59	11.3	1390.5	4.883	-23.95	917.9	100.3	0.005	0.052
124	240	8	59	13.3	2128.4	2.176	-19.87	1519.4	101.5	0.016	0.078
125	240	9	0	48.3	2140.0	3.582		1506.6			
126	240	9	6	22.3	1942.5	4.206	-18.20	1357.8	102.3	0.008	0.113
127	240	9	9	11.3	1617.3	-3.931	-22.37	1187.1	82.8	0.003	0.057
128	240	9	15	44.3	1973.1	-4.137	-19.71	1464.4	73.9	0.015	0.081
129	240	9	18	57.3	1293.4	-0.377	-17.90	906.6	63.0	0.059	0.118
130	240	9	20	59.3	1156.3	5.018	-24.04	748.3	98.5	0.004	0.051
131	240	9	25	30.3	812.1	-2.392	-27.69	586.4	57.0	0.285	0.044
132	240	9	27	57.3	1907.5	3.284	-16.88	1327.7	101.2	0.006	0.143
133	240	9	47	32.3	2045.5	-2.953	-16.48	1515.6	74.3	0.014	0.152
134	240	9	48	6.3	1490.9	3.266	-20.66	1013.6	89.6	0.003	0.069
135	240	9	49	15.3	1333.5	-3.416	-19.54	986.3	57.1	0.293	0.084
136	240	9	57	52.0	1309.0	1.503	-26.29	897.9	70.7	0.009	0.046

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**Table E-1. Detections observed by the COBRA DANE radar
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NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
137	240	9	59	10.3	1420.9	3.143	-21.95	964.5	82.5	0.002	0.059
138	240	10	11	9.3	1560.7	-1.372	-22.14	1110.9	82.1	0.036	0.058
139	240	10	14	6.3	1189.4	-2.728	-21.64	854.9	71.0	0.017	0.061
140	240	10	20	59.3	1124.6	-4.301	-16.98	830.8	63.1	0.050	0.140
141	240	10	22	23.0	986.9	4.624	-19.76	635.9	97.7	0.004	0.080
142	240	10	27	43.3	870.0	-1.670	-21.44	619.7	82.3	0.031	0.062
143	240	10	28	33.3	1296.5	2.878	-24.92	871.5	82.8	0.002	0.049
144	240	10	30	13.0	1129.7	0.831	-23.95	772.4	98.0	0.006	0.052
145	240	10	31	29.3	1500.5	-4.068	-20.05	1108.4	63.4	0.052	0.076
146	240	10	35	47.3	1389.4	2.655	-19.01	945.0	82.6	0.002	0.098
147	240	10	38	28.3	1335.3	2.551	-24.74	908.1	99.4	0.012	0.049
148	240	10	42	11.0	831.3	-3.385	-20.29	608.5	57.0	0.293	0.073
149	240	10	56	10.3	1338.0	-0.368	-24.37	934.1	100.1	0.073	0.050
150	240	10	56	45.3	1349.4	1.011	-22.02	926.0	100.1	0.073	0.059
151	240	10	58	27.3	1274.6	5.125	-22.84	834.1	99.3	0.004	0.055
152	240	11	13	3.0	983.2	-1.111	-24.42	685.0	75.6	0.009	0.050
153	240	11	14	14.2	957.5	3.031	-24.19	628.9	98.1	0.009	0.051
154	240	11	14	17.3	1034.2	2.394	-23.26	684.6	75.7	0.010	0.054
155	240	11	44	3.3	1955.4	2.400	-15.10	1371.3	82.3	0.025	0.176
156	240	11	45	6.3	810.3	-2.555	-17.53	579.4	56.9	0.288	0.124
157	240	11	47	46.0	802.2	-3.120	-21.08	584.0	56.9	0.291	0.065
158	240	11	50	3.3	1822.8	-5.343	-8.07	1328.7	62.4	0.182	0.450
159	240	11	56	48.3	1550.8	3.897	-17.56	1056.3	102.5	0.032	0.124
160	240	11	58	47.3	1065.8	1.868	-25.23	716.8	81.1	0.006	0.048
161	240	12	0	42.2	842.2	-1.356	-20.66	588.9	70.3	0.002	0.069
162	240	12	1	19.3	1685.6	-0.493		1205.2			
163	240	12	2	24.3	1705.0	1.078	-16.79	1203.9	81.5	0.015	0.145
164	240	12	3	29.3	2276.5	-3.050		1689.3			
165	240	12	6	55.3	579.6	-5.020	-22.77	432.9	60.7	0.060	0.056
166	240	12	10	32.3	1136.3	4.662	-23.76	734.3	98.9	0.003	0.052
167	240	12	13	38.3	1326.4	3.944	-25.08	885.8	89.8	0.012	0.049
168	240	12	20	17.3	1275.1	-1.376	-16.31	898.7	90.3	0.005	0.155
169	240	12	20	30.3	1233.7	1.783	-17.86	845.6	81.3	0.005	0.118
170	240	12	21	26.0	1747.0	-5.279	-13.52	1278.4	65.8	0.287	0.220
171	240	12	28	29.3	1037.5	-3.641	-17.05	767.1	56.9	0.295	0.139
172	240	12	35	25.3	1438.7	4.309	-21.83	968.8	99.8	0.002	0.060
173	240	12	39	21.3	1132.6	4.169	-25.23	738.4	98.8	0.009	0.048
174	240	12	48	9.3	2360.7	-2.697	-15.50	1745.1	62.2	0.079	0.171
175	240	12	50	6.3	1004.4	-4.367	-15.79	737.1	62.8	0.065	0.164
176	240	12	50	33.3	1393.6	4.663	-24.08	930.5	99.9	0.002	0.051
177	240	12	50	34.3	902.7	-3.964	-21.76	659.3	68.0	0.007	0.060
178	240	13	0	27.3	1125.5	-0.306	-23.40	782.3	83.1	0.004	0.053
179	240	13	3	15.0	1395.2	1.614	-21.74	963.0	82.5	0.002	0.061
180	240	13	6	20.3	1124.6	-4.031	-27.80	817.7	71.0	0.007	0.044
181	240	13	7	14.2	1383.3	0.232	-17.15	959.9	82.6	0.002	0.136
182	240	13	7	20.3	1986.3	2.528	-21.91	1406.3	82.6	0.009	0.060
183	240	13	10	55.3	990.0	-3.882	-22.56	717.4	80.6	0.068	0.056
184	240	13	29	40.3	1909.8	-3.428	-20.76	1400.3	82.5	0.005	0.068
185	240	13	34	51.3	1199.6	-3.264	-25.29	870.7	65.8	0.005	0.048
186	240	13	43	2.3	1027.1	-1.885	-26.71	729.5	63.4	0.044	0.046

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**Table E-1. Detections observed by the COBRA DANE radar
for the 2006 campaign - Cont.**

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
187	240	13	46	42.3	1405.3	-2.673	-20.26	1009.6	88.9	0.003	0.073
188	240	13	48	7.0	1744.1	4.539	-18.39	1192.0	100.9	0.081	0.109
189	240	13	49	2.3	1779.1	-0.503	-13.14	1266.8	82.5	0.020	0.230
190	240	13	49	22.3	943.2	-4.504	-19.71	708.5	56.8	0.290	0.081
191	240	13	49	42.2	1410.5	1.584	-24.64	970.9	83.0	0.001	0.050
192	240	13	49	46.3	1921.2	-0.903	-18.91	1383.6	99.9	0.053	0.099
193	240	13	50	41.3	1907.0	0.393	-18.73	1361.9	100.2	0.062	0.102
194	240	13	54	59.3	965.0	-4.216	-22.69	714.9	65.1	0.103	0.056
195	240	13	59	24.3	2000.2	2.251	-20.84	1413.6	82.2	0.058	0.067
196	240	14	3	45.3	2395.1	-1.852	-16.72	1750.5	85.3	0.244	0.146
197	240	14	4	25.3	2336.1	-1.090	-16.09	1700.3	85.5	0.246	0.158
198	240	14	10	10.0	1013.9	-0.956	-26.68	706.4	69.9	0.003	0.046
199	240	14	15	2.3	1905.3	-1.566	-18.04	1371.3	69.3	0.078	0.116
200	240	14	15	29.3	1422.2	-2.956	-18.74	1030.0	63.5	0.056	0.102
201	240	14	18	38.3	1084.8	3.825	-19.19	709.3	98.7	0.001	0.095
202	240	14	22	59.3	1103.9	-4.664	-19.94	809.1	65.7	0.163	0.077
203	240	14	24	56.0	1217.7	-2.297	-10.47	868.3	63.4	0.036	0.315
204	240	14	26	52.3	1326.5	-1.960	-23.66	945.5	99.2	0.014	0.052
205	240	14	28	52.0	1903.1	-2.470	-16.76	1389.0	82.1	0.013	0.145
206	240	14	29	50.3	2048.3	-2.464	-16.69	1503.4	82.2	0.004	0.147
207	240	14	43	48.0	843.1	-4.314	-20.71	618.1	71.0	0.004	0.068
208	240	14	50	4.3	1108.3	-4.224	-23.25	806.7	70.7	0.008	0.054
209	240	14	52	56.3	1094.0	4.597	-23.06	701.7	98.7	0.001	0.054
210	240	14	56	47.3	1739.0	-3.079	-21.41	1299.2	57.0	0.301	0.063
211	240	14	57	9.3	1710.9	3.846	-21.02	1170.2	100.2	0.014	0.066
212	240	14	57	51.3	1302.5	2.225	-23.79	886.9	98.7	0.017	0.052
213	240	14	58	35.3	1929.0	-2.810	-21.12	1409.5	82.5	0.005	0.065
214	240	15	0	46.0	1334.1	-3.528	-25.73	968.8	82.7	0.006	0.047
215	240	15	3	48.3	1545.6	2.904	-23.05	1058.2	82.9	0.017	0.054
216	240	15	14	58.3	1347.7	-2.475	-17.47	974.4	61.8	0.064	0.126
217	240	15	16	27.2	1143.3	-2.334	-21.07	818.4	82.8	0.004	0.065
218	240	15	23	23.0	2188.2	2.852	-17.97	1560.0	102.1	0.023	0.117
219	240	15	29	0.3	808.7	-4.005	-20.53	594.8	82.7	0.003	0.070
220	240	15	30	29.3	2208.2	-1.385	-16.54	1618.4	66.9	0.062	0.150
221	240	15	34	44.0	762.1	-3.889	-17.57	555.1	82.6	0.002	0.123
222	240	15	39	32.3	872.2	-2.410	-22.12	623.9	69.9	0.002	0.058
223	240	15	39	47.3	1725.9	4.592	-18.59	1177.7	100.7	0.019	0.104
224	240	15	41	29.3	1905.6	2.662	-20.28	1341.6	87.9	0.014	0.073
225	240	15	54	17.3	1056.7	-3.639	-25.41	762.9	62.8	0.088	0.048
226	240	15	55	12.0	2136.8	1.933	-18.83	1528.1	103.8	0.042	0.100
227	240	15	56	32.3	2099.6	4.357		1470.5			
228	240	15	59	36.0	2243.3	-5.499	-15.84	1661.0	56.8	0.256	0.163
229	240	16	3	17.3	1506.7	2.617	-23.71	1032.5	99.2	0.007	0.052
230	240	16	6	25.3	1653.9	-2.909	-17.43	1222.3	57.1	0.293	0.128
231	240	16	17	3.0	1073.6	-2.523	-19.82	764.7	90.3	0.005	0.079
232	240	16	18	40.3	1448.7	0.209	-24.52	1011.9	99.8	0.003	0.050
233	240	16	21	19.3	882.3	-2.718	-16.61	628.3	65.0	0.017	0.149
234	240	16	21	38.3	824.5	-0.839	-25.62	569.8	83.2	0.010	0.048
235	240	16	27	29.0	1006.0	2.522	-22.29	666.8	98.6	0.003	0.058
236	240	16	28	16.3	1882.5	-3.960	-20.05	1392.3	64.7	0.088	0.076

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**Table E-1. Detections observed by the COBRA DANE radar
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	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
237	240	16	48	51.3	1862.0	-2.656	-16.43	1384.3	57.0	0.303	0.153
238	240	16	59	44.3	1548.0	-4.421	-19.12	1145.9	69.1	0.076	0.097
239	240	17	2	13.3	1807.2	-5.798	-18.20	1326.6	56.8	0.269	0.113
240	240	17	2	53.3	1684.8	-5.384	-19.23	1233.6	56.8	0.245	0.094
241	240	17	12	12.3	1063.8	-3.279	-26.04	768.3	82.9	0.002	0.047
242	240	17	20	2.3	1110.9	-4.958	-22.28	817.4	65.7	0.162	0.058
243	240	17	20	19.3	1706.0	0.314	-20.10	1203.5	82.9	0.001	0.075
244	240	17	21	41.0	1518.0	-2.082	-20.27	1089.0	62.6	0.055	0.073
245	240	17	24	43.2	1479.0	3.081	-19.42	1009.5	100.0	0.000	0.086
246	240	17	27	31.3	1799.4	0.099	-19.21	1306.6	65.6	0.261	0.094
247	240	17	28	4.3	1418.2	-3.105	-20.54	1026.9	82.9	0.024	0.070
248	240	17	29	38.0	2305.4	3.513	-18.17	1637.6	100.0	0.041	0.114
249	240	17	38	16.3	2010.7	-2.477	-16.26	1509.8	57.0	0.295	0.156
250	240	17	40	32.3	1634.5	-1.448	-17.59	1170.4	100.5	0.005	0.123
251	240	17	46	21.3	2100.1	3.864		1470.3			
252	240	17	51	42.3	1056.5	1.092	-25.16	717.5	81.2	0.002	0.049
253	240	17	56	45.0	915.3	3.570	-23.21	593.3	98.7	0.008	0.054
254	240	18	0	25.3	1358.5	-4.576	-20.57	994.7	71.0	0.016	0.070
255	240	18	8	19.3	1249.7	-4.867	-18.10	914.9	65.9	0.074	0.115
256	240	18	11	11.0	1481.2	-4.130	-23.32	1083.5	66.8	0.027	0.054
257	240	18	14	37.3	1148.4	-1.543	-18.85	810.9	81.3	0.006	0.100
258	240	18	14	55.0	1999.6	4.569	-20.87	1394.0	102.9	0.009	0.067
259	240	18	19	23.3	1421.0	-5.791	-15.94	1036.2	56.9	0.259	0.161
260	240	18	21	12.0	1997.6	-1.072	-18.52	1446.2	103.0	0.027	0.106
261	240	18	22	54.3	2004.1	1.198	-18.02	1434.0	102.9	0.027	0.116
262	240	18	26	30.0	844.3	-4.251	-23.14	618.9	75.7	0.007	0.054
263	240	18	33	20.3	938.6	5.339	-18.43	587.1	98.6	0.003	0.108
264	240	18	35	39.0	2004.0	4.125	-18.00	1393.9	102.1	0.038	0.116
265	240	18	43	57.0	1585.5	4.698	-19.29	1068.9	105.9	0.086	0.092
266	240	18	44	14.2	1095.1	2.449	-23.85	732.0	98.1	0.004	0.052
267	240	18	44	24.3	1612.2	-3.180	-21.36	1178.6	61.5	0.067	0.063
268	240	18	48	0.3	1139.1	5.160	-28.15	743.1	120.4	0.167	0.043
269	240	18	53	10.0	994.5	-2.557	-21.21	708.1	81.2	0.004	0.064
270	240	18	54	36.3	1012.1	1.069	-28.64	697.0	65.6	0.195	0.043
271	240	18	57	55.3	1278.8	-1.975	-25.02	914.2	82.8	0.006	0.049
272	240	19	6	8.3	1128.6	4.418	-21.68	734.6	99.6	0.006	0.061
273	240	19	12	47.3	1149.1	-2.929	-26.79	828.9	82.9	0.002	0.045
274	240	19	15	10.3	1045.6	5.523	-26.09	660.2	102.7	0.003	0.047
275	240	19	15	43.3	2011.1	-2.964	-18.75	1473.5	74.3	0.014	0.102
276	240	19	17	55.3	1737.7	-0.237	-20.01	1241.5	81.9	0.019	0.076
277	240	19	23	40.0	1535.9	3.563	-21.49	1046.6	100.1	0.021	0.062
278	240	19	27	33.0	1396.6	-4.549	-21.30	1016.8	71.0	0.017	0.063
279	240	19	30	20.3	1880.9	2.998	-20.03	1317.3	101.3	0.015	0.076
280	240	19	33	33.1	1231.8	-4.811	-19.49	897.0	63.7	0.315	0.085
281	240	19	33	41.0	1312.8	-5.291	-17.19	948.4	56.9	0.289	0.135
282	240	19	37	52.0	1708.9	-3.246	-15.17	1245.8	80.4	0.021	0.176
283	240	19	42	42.3	1103.6	-1.538	-25.95	781.1	98.4	0.004	0.047
284	240	19	43	4.3	1714.0	-3.331	-19.45	1246.8	82.1	0.025	0.085
285	240	19	47	5.3	1049.5	-1.598	-22.67	736.3	99.1	0.010	0.056
286	240	19	51	33.0	1438.3	-4.237	-13.06	1052.8	63.3	0.036	0.232

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**Table E-1. Detections observed by the COBRA DANE radar
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	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
NO.	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
287	240	19	58	15.3	1545.1	1.999	-19.53	1070.5	83.0	0.011	0.084
288	240	19	59	57.3	2031.1	-2.031	-18.55	1483.4	73.5	0.005	0.105
289	240	20	1	38.3	794.9	-3.583	-19.71	578.9	83.1	0.000	0.081
290	240	20	3	26.3	1360.4	3.467	-22.74	914.3	82.5	0.000	0.056
291	240	20	7	31.0	1042.4	2.051	-20.70	701.5	83.2	0.001	0.068
292	240	20	16	7.3	1686.0	-1.290	-18.25	1208.3	82.5	0.035	0.112
293	240	20	22	22.0	1326.4	0.190	-17.62	918.8	82.6	0.002	0.122
294	240	20	30	30.3	1015.7	-5.457	-22.73	737.0	56.9	0.288	0.056
295	240	20	34	7.3	1554.8	-4.621	-21.58	1146.9	69.2	0.075	0.062
296	240	20	39	5.3	1594.8	1.971	-19.12	1108.6	99.6	0.052	0.097
297	240	20	39	29.3	1444.1	-0.473	-22.31	1023.4	83.3	0.008	0.057
298	240	20	41	4.0	1767.8	-3.977	-17.98	1299.2	66.0	0.065	0.116
299	240	20	41	39.3	1507.8	-2.958	-5.81	1086.3	63.4	0.034	0.578
300	240	20	52	47.0	940.1	-3.323	-20.98	690.6	62.6	0.100	0.066
301	240	20	57	11.3	1053.8	-1.245	-27.51	740.8	71.1	0.007	0.044
302	240	21	1	13.0	1114.5	-3.296	-24.09	804.2	73.5	0.060	0.051
303	240	21	2	33.3	2031.2	-3.300	-14.93	1496.4	82.2	0.034	0.185
304	240	21	6	58.3	2108.0	-3.315	-17.99	1564.5	56.6	0.097	0.116
305	240	21	18	24.3	888.5	-2.411	-23.90	633.3	90.0	0.001	0.052
306	240	21	20	24.0	1396.6	1.533	-20.54	964.9	83.2	0.006	0.070
307	240	21	22	21.3	934.2	-3.088	-28.28	673.5	89.7	0.003	0.043
308	240	21	29	20.3	1300.8	-4.061	-20.59	956.2	62.3	0.053	0.069
309	240	21	41	12.3	2025.3	-1.545	-15.35	1467.8	66.8	0.018	0.174
310	240	21	43	14.3	1809.6	-3.772	-15.60	1331.3	82.4	0.025	0.168
311	240	21	49	35.3	1372.6	-2.087	-22.15	980.0	100.0	0.002	0.058
312	240	21	51	2.0	1466.9	-4.991	-17.67	1062.7	56.8	0.204	0.122
313	240	21	55	22.0	767.4	-5.889	-21.10	574.6	63.9	0.364	0.065
314	240	21	56	2.3	1452.8	-1.569	-18.50	1035.0	74.8	0.017	0.106
315	240	21	57	46.3	1968.0	4.588	-20.05	1363.1	102.1	0.012	0.076
316	240	22	1	17.3	961.8	-4.939	-23.58	696.7	56.9	0.295	0.053
317	240	22	1	42.3	1401.1	1.997	-22.97	961.6	82.9	0.011	0.055
318	240	22	3	35.3	850.9	-4.306	-26.32	628.6	62.4	0.088	0.046
319	240	22	5	40.0	1487.1	-0.505	-20.29	1046.3	90.0	0.007	0.073
320	240	22	6	15.3	1488.9	0.605	-21.21	1047.5	90.1	0.007	0.064
321	240	22	11	50.3	1006.5	-2.489	-25.87	718.7	81.3	0.000	0.047
322	240	22	20	11.0	1796.7	-3.774	-20.52	1320.7	82.1	0.054	0.070
323	240	22	23	42.0	1954.9	-1.100	-18.29	1410.9	99.7	0.018	0.111
324	240	22	26	53.3	840.2	-4.711	-17.60	625.1	64.5	0.230	0.123
325	240	22	31	11.0	1414.5	-1.764	-22.81	1016.3	99.3	0.024	0.055
326	240	22	31	48.0	1200.4	-1.772	-23.98	857.8	63.0	0.073	0.051
327	240	22	35	18.3	1080.8	-1.070	-25.87	757.2	98.4	0.003	0.047
328	240	22	45	55.3	1445.7	-4.410	-18.75	1058.7	71.1	0.019	0.102
329	240	22	46	17.3	1420.0	2.851	-22.00	970.4	100.0	0.001	0.059
330	240	22	47	28.3	749.1	-4.758	-20.86	543.4	56.9	0.318	0.067
331	240	22	56	31.0	728.4	-3.994	-19.45	519.8	56.9	0.315	0.085
332	240	22	57	30.0	2232.8	-3.476	-17.45	1670.1	56.7	0.096	0.127
333	240	23	0	6.0	1776.8	2.690	-13.72	1234.1	103.2	0.015	0.215
334	240	23	13	20.0	1483.2	4.905	-21.90	981.7	100.6	0.029	0.060
335	240	23	15	36.3	1244.7	3.234	-22.79	832.4	81.2	0.004	0.055

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**Table E-1. Detections observed by the COBRA DANE radar
for the 2006 campaign - Cont.**

NO.	Epoch				Slant Range	Range Rate	Radar Cross Section	Altitude	Inclination	Eccentricity	Characteristic Length
	doy	hr	min	sec	(km)	(km/sec)	(dBsm)	(km)	(deg)		(m)
336	240	23	17	41.0	1687.2	-5.622	-21.73	1237.4	57.1	0.277	0.061
337	240	23	19	53.3	596.1	-3.998		443.7			
338	240	23	22	57.1	1441.3	3.044	-22.31	963.6	82.8	0.006	0.057
339	240	23	25	38.3	2072.1	-1.614	-16.03	1504.1	82.6	0.006	0.159
340	240	23	27	13.3	779.9	-1.426	-22.75	545.2	97.6	0.003	0.056
341	240	23	28	50.3	1027.2	-2.907	-21.93	737.9	81.2	0.001	0.059
342	240	23	31	33.3	1341.9	-2.069	-23.31	964.0	82.6	0.001	0.054
343	240	23	38	48.3	1507.7	2.961	-22.07	1032.2	99.7	0.001	0.059
344	240	23	40	30.3	1434.1	0.283	-24.73	1002.7	65.9	0.002	0.049
345	240	23	43	29.3	1376.4	-0.983	-19.34	970.9	82.6	0.003	0.090
346	240	23	46	2.3	1749.8	3.094	-18.62	1210.7	100.3	0.027	0.103
347	240	23	49	51.0	1118.8	-4.573	-22.25	814.5	62.7	0.036	0.058
348	240	23	52	53.3	1072.0	-2.056	-28.24	762.8	98.5	0.003	0.043
349	240	23	53	10.0	856.8	-3.784	-26.38	613.8	56.9	0.207	0.046
350	240	23	54	3.3	2071.4	1.626	-17.70	1480.6	81.7	0.020	0.121
351	241	0	3	29.3	1307.2	4.093	-22.27	869.9	90.3	0.005	0.058
352	241	0	3	41.3	781.9	-4.339	-16.11	577.0	65.2	0.148	0.158
353	241	0	4	51.3	1593.3	3.793	-21.88	1087.9	101.8	0.001	0.060
354	241	0	13	29.3	1164.7	-4.588		854.4			