Cassini Ultraviolet Imaging Spectrograph
UVIS HSP

Ring Stellar Occultation Atlas

Volume 4: Rev 060 – Rev 090

Version: 1.3
May 31, 2018

Table of Contents

The table lists all occultations in this volume, including the star name, rev number, indication of ingress (I) or egress (E), date of the occultation, duration of the occultation, radial range coverage and elevation angle of the star.

Occultations are presented chronologically in the order they were observed. To keep the file size of this atlas manageable, it is presented in multiple volumes, each one covering a subset of the occultations.

Introduction

Over the course of the Cassini mission, the High Speed Photometer (HSP) of the Ultraviolet Imaging Spectrograph (UVIS) observed 170 occultations of stars by Saturn's rings. Details on the UVIS instrument can be found in Esposito et al. (1998, 2004). Information on the handling of HSP ring occultation data as well as a summary of data calibration and reduction techniques for the first part of the Cassini mission are in Colwell et al. (2010). This document provides a tabular and visual overview of these stellar occultations.

Description of Data Products in the Atlas

The HSP data consist of a time series of measured photon counts. With the exception of observations of some faint stars where the background signal dominates or is a significant contribution, the measured signal is primarily due to starlight transmitted through the rings. The HSP integration times are 1, 2, 4, or 8 msec. The majority of occultations used a 1 msec integration period, with most of the rest at 2 msec. In this atlas the data are binned to 1 second.

The data are shown in two plots: (1) a plot spanning the range of 70,000 km to 150,000 km from Saturn for all occultations to allow direct comparison of signal and coverage on a single distance scale; and (2) a plot that shows the data zoomed to the radial range of coverage of the occultation.

Two additional geometry plots are included for each occultation: (1) the radial ring plane resolution of the occultation (in the frame of Saturn, not accounting for ring particle motion or diffraction); and (2) the value of ϕ, an angle measured in the ring plane in the counterclockwise sense from the outward radial vector at the measurement point to the direction to the star projected into the ring plane. Thus, an observation where the look vector to the star is tangent to the rings has ϕ=90 degrees.

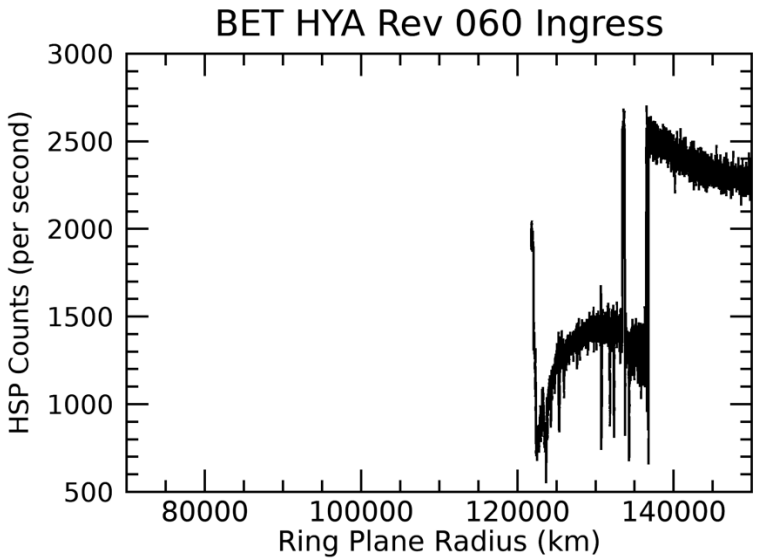
On the page following the data plots, a geometry visualization is shown at a time near the middle of the occultation. The position of the UVIS HSP field of view is labeled on each of these plots. Occultations that cut a chord across the rings, are presented here as separate "Ingress" and "Egress" occultations, referring to the portion of the occultation where the observation point is approaching or receding from Saturn, respectively. Some geometry visualizations are missing and will be included in the next revision of this volume.

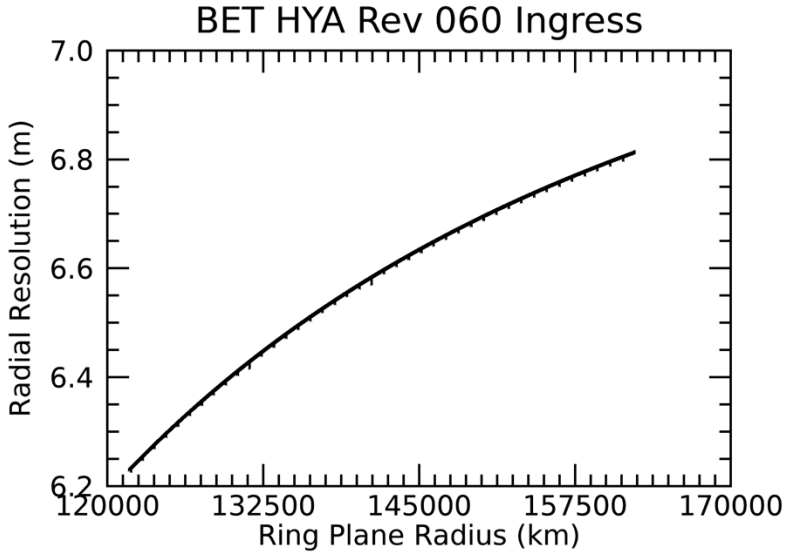
Document assembled by Joshua Colwell, UVIS Co-Investigator, University of Central Florida, with the assistance of Stephanie Eckert Grant, Richard Jerousek, and Tina Notrika, UCF.

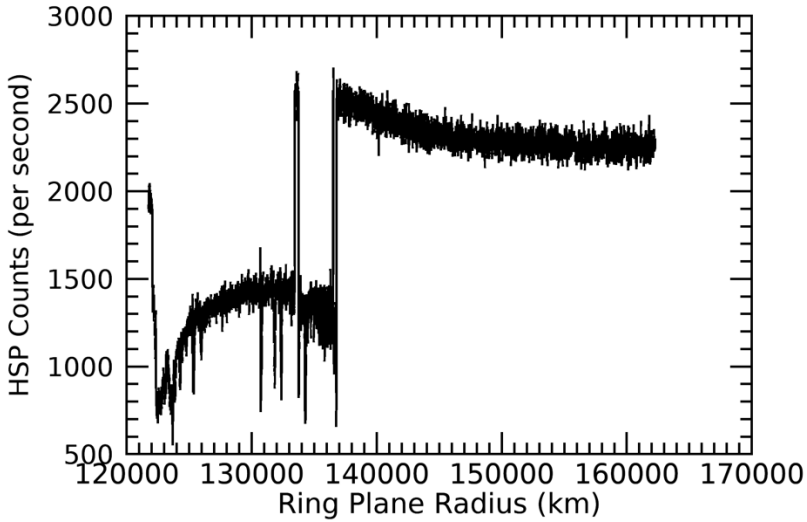
References

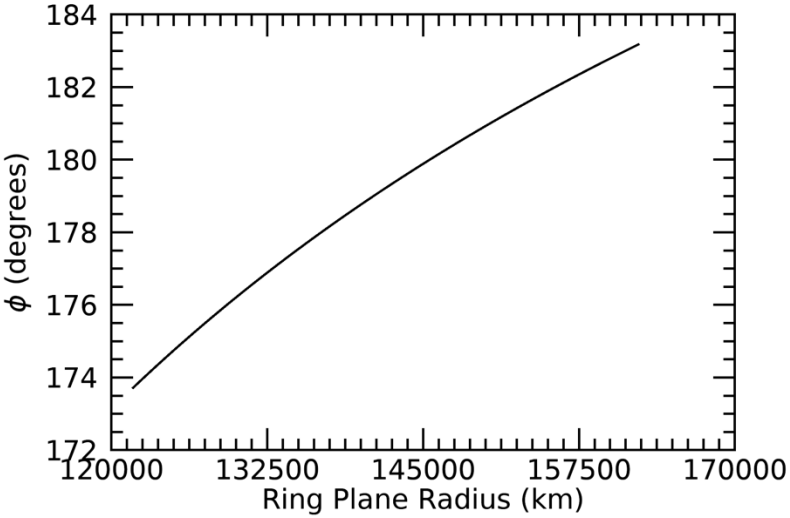
1. Colwell, J. E., L. W. Esposito, D. Pettis, M. Sremčević, R. G. Jerousek, E. T. Bradley 2010. Cassini UVIS Stellar Occultation Observations of Saturn's Rings. *Astron. J.* **140**, 1569-1578, doi:10.1088/0004-6256/140/6/1569.
2. Esposito, L. W., J. E. Colwell, and W. E. McClintock 1998. Cassini UVIS Observations of Saturn's Rings. *Planet. Space Sci.* **46**, 1221-1235.
3. Esposito, L. W., C. A. Barth, J. E. Colwell, G. M. Lawrence, W. E. McClintock, A. I. F. Stewart, H. U. Keller, , A. Korth, H. Lauche, M. Festou, A. L. Lane, C. J. Hansen, J. N. Maki, R. A. West, H. Jahn, R. Reulke, K. Warlich, D. E. Shemansky, and Y. L. Yung 2004. The Cassini Ultraviolet Imaging Spectrograph Investigation. *Space Sci. Rev.* **115**, 299-361.

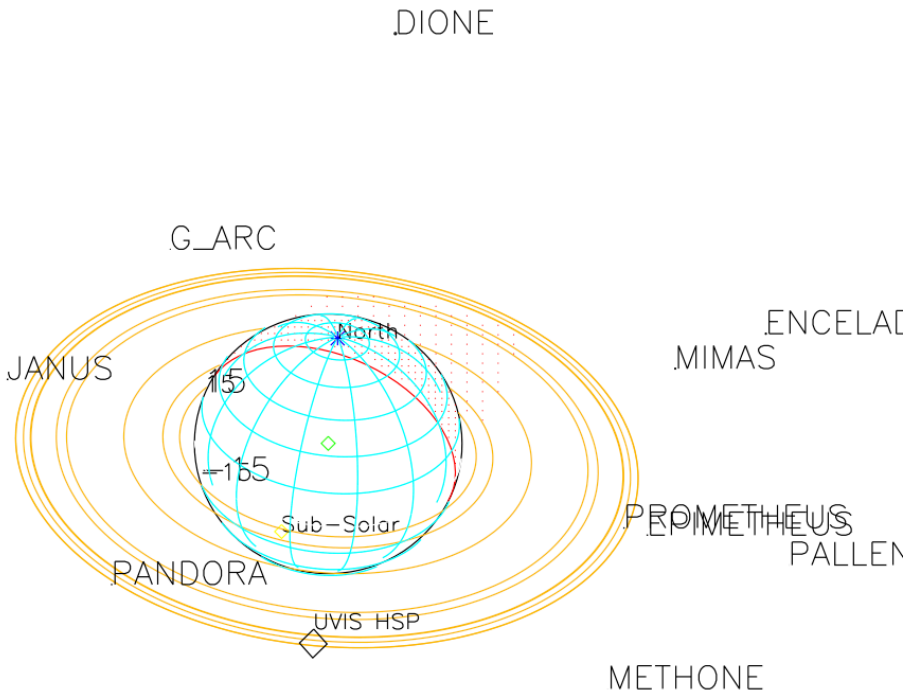
Star		Rev	Ing/Eg	Year/Day	B	ϕ	Radius	Duration (min)
β	HYA	60	I	2008-059	38.6	183.2-173.7	162266-121735	205.7
δ	PER	60	I	2008-062	-54	274.5-283.9	146216- 54973	126.2
ζ	CEN	60	I	2008-060	53.6	231.2-221.1	146506- 66647	288.7
ζ	CEN	62	E	2008-082	53.6	77.3- 67.0	63689-145087	297.2
α	ARA	63	E	2008-092	54.4	95.8-112.3	73260-141565	142.2
α	SEX	63	E	2008-095	2.7	271.2-337.4	90295-223682	55.6
α	SEX	63	I	2008-095	2.7	207.7-271.2	202539- 90295	49.3
β	CEN	64	E	2008-101	66.7	137.8- 89.7	84951-151166	344.8
δ	CEN	64	E	2008-100	55.6	117.2-107.9	131696-133387	78.6
δ	CEN	64	I	2008-100	55.6	127.9-117.2	133945-131696	90.7
γ	CAS	64	I	2008-102	-66.3	201.9-177.9	119600- 71732	73.5
α	ARA	65	E	2008-111	54.4	110.4-112.9	125009-143857	38.7
ε	CEN	65	I	2008-110	59.6	229.0-221.7	148191- 69866	262.2
δ	CEN	66	E	2008-119	55.6	117.4-110.6	130072-130974	56.9
δ	CEN	66	I	2008-119	55.6	142.4-117.4	143054-130072	220.9
δ	CEN	68	I	2008-137	55.6	203.4-201.9	150366-124550	78.8
θ	HYA	70	E	2008-156	-1.4	89.5-160.3	126499-384125	54.5
θ	HYA	70	I	2008-156	-1.4	17.9- 89.5	401040-126499	57.1
θ	HYA	71	E	2008-163	-1.4	89.5-153.9	124439-287670	39
θ	HYA	71	I	2008-163	-1.4	23.2- 89.5	310043-124439	42.7
β	CEN	75	I	2008-188	66.7	264.4-283.5	144447- 72426	160.2
γ	CNC	75	I	2008-190	-21.3	24.1- 79.8	130699- 71827	170.7
β	CEN	77	E	2008-203	66.7	34.6- 54.4	73267-143445	169.8
β	CEN	77	I	2008-203	66.7	264.4-282.9	144893- 73333	158
β	CEN	78	E	2008-210	66.7	23.7- 54.8	58469-145024	212.2
α	ARA	79	E	2008-217	54.4	49.5- 70.2	94195-100266	47.9
α	ARA	79	I	2008-217	54.4	354.2- 49.5	157552- 94195	177.1
β	CEN	81	I	2008-231	66.7	267.6-294.4	151691- 72828	203.2
γ	CRU	82	I	2008-238	62.3	225.5-240.6	154701- 54365	254.2
α	ARA	85	E	2008-261	54.4	49.7-106.4	93509-157486	181.2
α	ARA	85	I	2008-261	54.4	353.3- 49.7	160543- 93509	182
β	CEN	85	I	2008-261	66.7	269.5-295.3	143414- 73110	183.2
α	ARA	86	E	2008-268	54.4	49.8-107.2	93406-160105	186.2
α	ARA	86	I	2008-268	54.4	352.5- 49.8	163469- 93406	187
α	CRU	87	I	2008-275	68.2	194.9-190.2	92911- 74173	46.8
β	CEN	89	I	2008-290	66.7	269.8-296.4	141885- 71853	182.2
α	ARA	90	E	2008-298	54.4	49.7-106.7	92106-156651	180.2
α	ARA	90	I	2008-298	54.4	352.7- 49.7	160553- 92106	182.5


BET HYA Rev 060 Ingress
HSP Counts (per second)
3000
2500
2000
1500
1000
500
80000
100000
120000
140000
Ring Plane Radius (km)


BET HYA Rev 060 Ingress
Radial Resolution (m)
7.0
6.8
6.6
6.4
6.2
120000
132500
145000
157500
170000
Ring Plane Radius (km)


HSP Counts (per second)
3000
2500
2000
1500
1000
500
120000
130000
140000
150000
160000
170000
Ring Plane Radius (km)


ϕ (degrees)
184
182
180
178
176
174
172
120000
132500
145000
157500
170000
Ring Plane Radius (km)

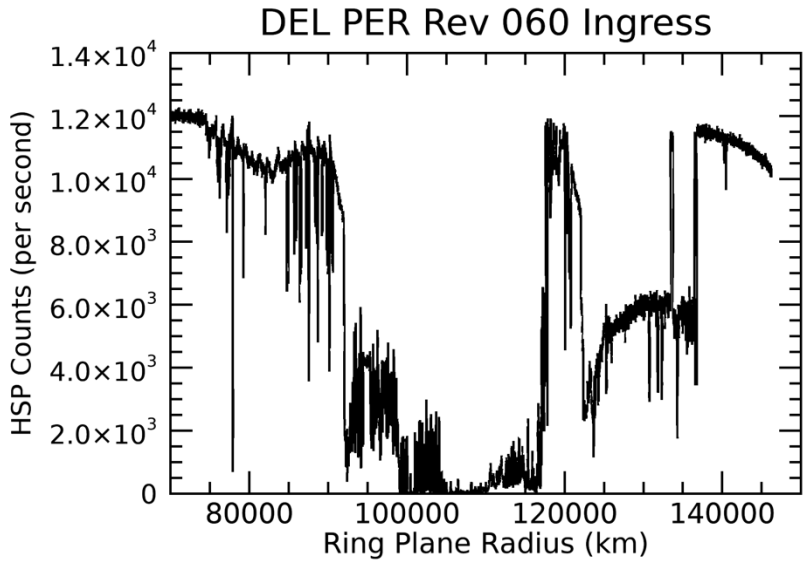


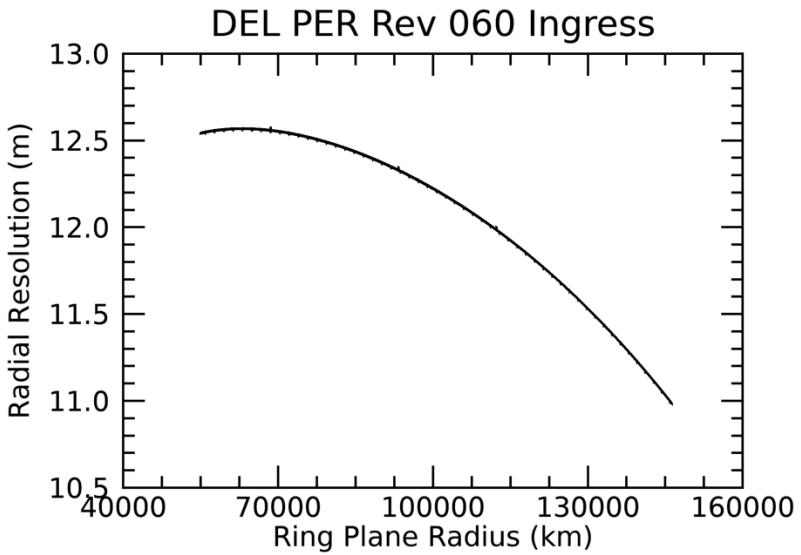
2008−058T23:25:00.000 1458114.4 km

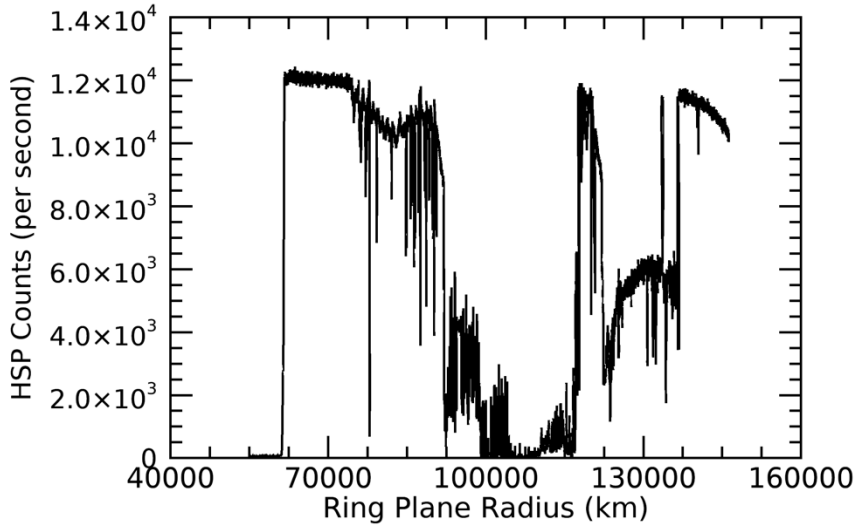
Target RA/dec: 177.92, −30.43

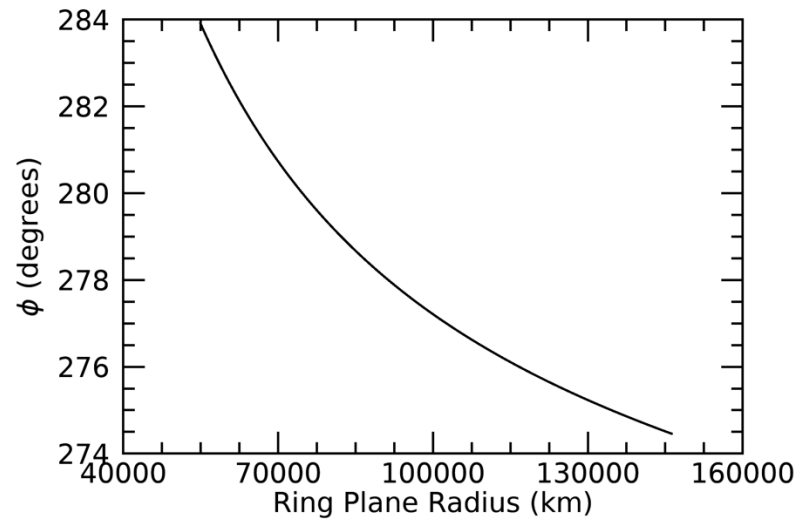
Subsolar lat/lon: −6.66, 27.82

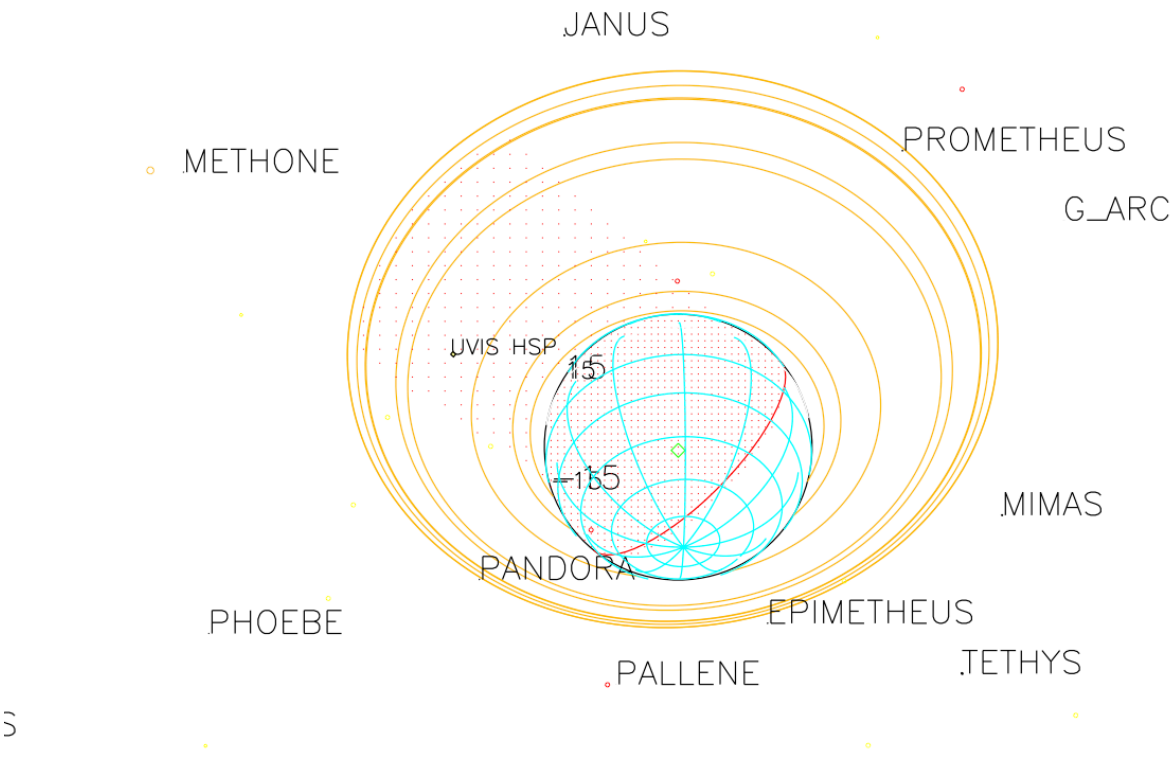
Sub−s/c lat/lon: 29.94, 44.25


DEL PER Rev 060 Ingress
HSP Counts (per second)
1.4×10^4
1.2×10^4
1.0×10^4
8.0×10^3
6.0×10^3
4.0×10^3
2.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


DEL PER Rev 060 Ingress
Radial Resolution (m)
13.0
12.5
12.0
11.5
11.0
10.5
40000
70000
100000
130000
160000
Ring Plane Radius (km)


HSP Counts (per second)
1.4×10^4
1.2×10^4
1.0×10^4
8.0×10^3
6.0×10^3
4.0×10^3
2.0×10^3
0
40000
70000
100000
130000
160000
Ring Plane Radius (km)


ϕ (degrees)
284
282
280
278
276
274
40000
70000
100000
130000
160000
Ring Plane Radius (km)

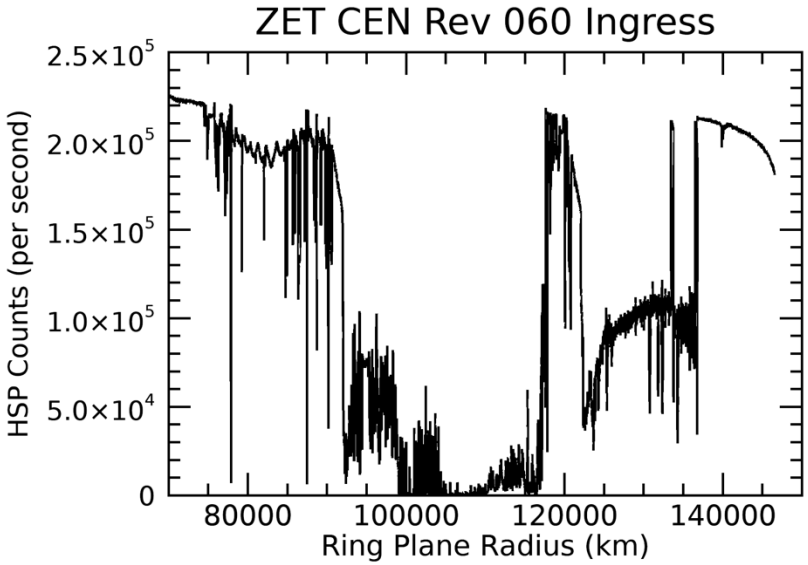


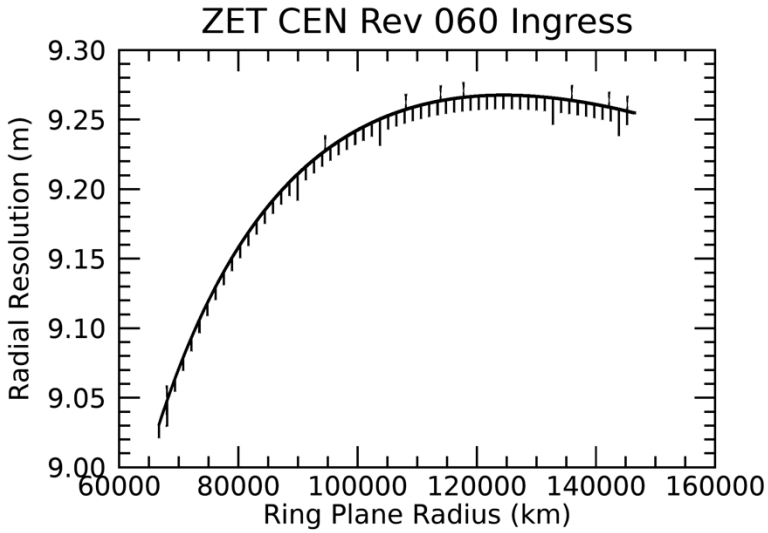
2008-062T07:42:00.000 249683.09 km

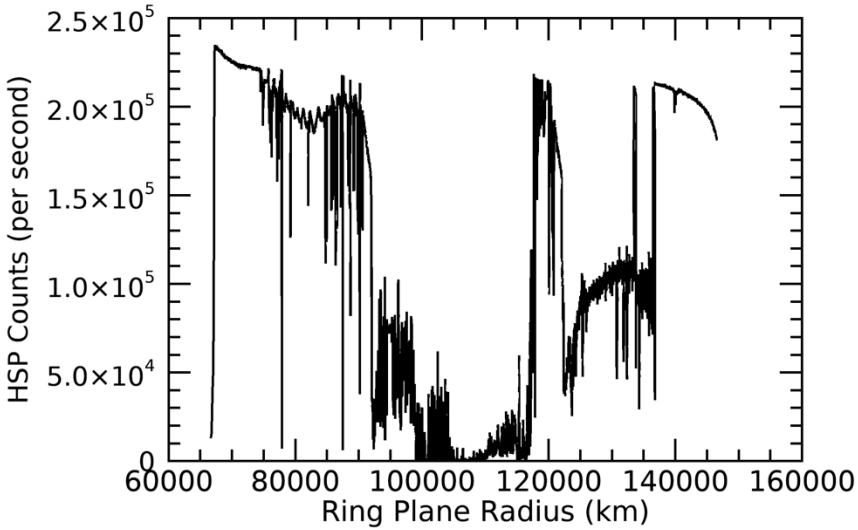
Target RA/dec: 21.28, 43.53

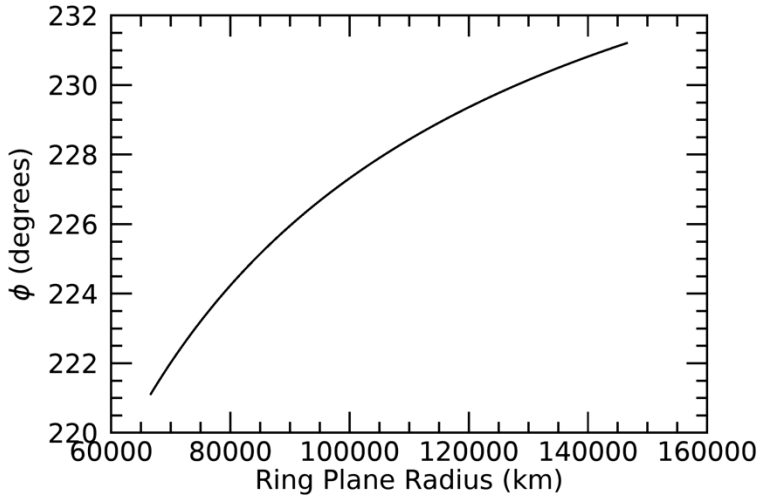
Subsolar lat/lon: -6.62, -164.33

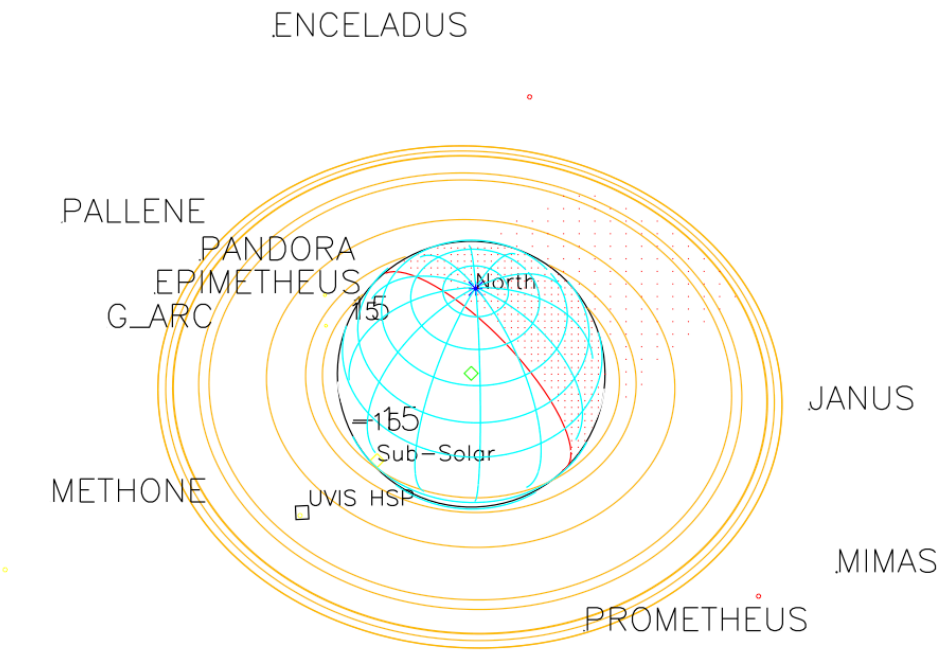
Sub-s/c lat/lon: -45.06, 55.86


ZET CEN Rev 060 Ingress
HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ZET CEN Rev 060 Ingress
Radial Resolution (m)
9.30
9.25
9.20
9.15
9.10
9.05
9.00
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
232
230
228
226
224
222
220
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)



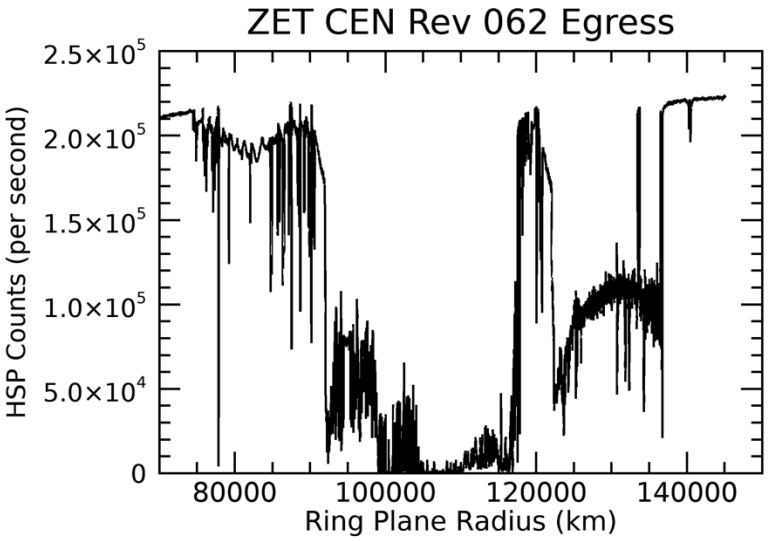
2008−060T18:29:00.000 958349.05 km

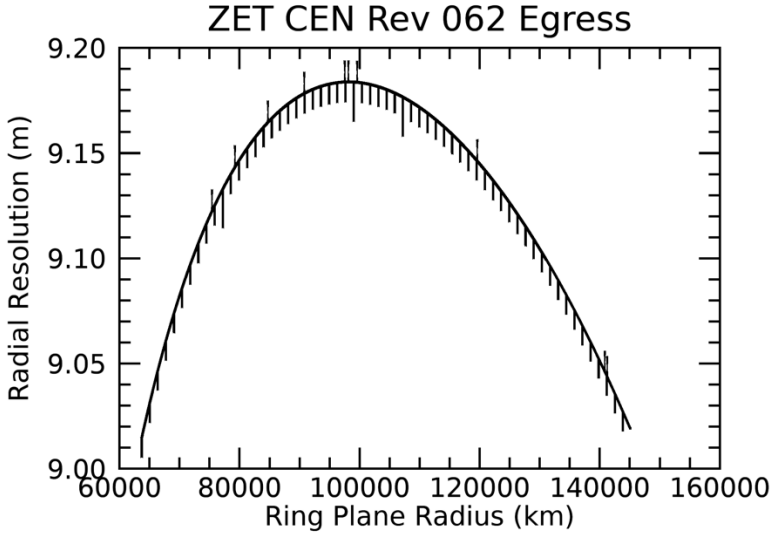
Target RA/dec: 202.10, −43.83

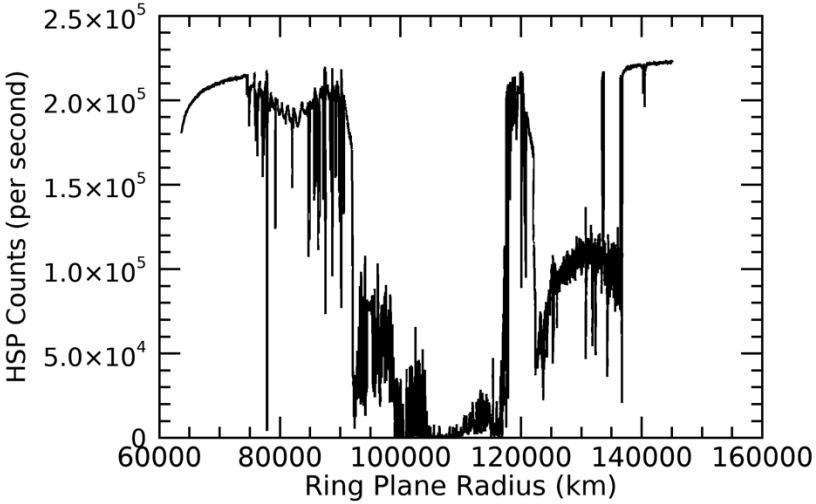
Subsolar lat/lon: −6.63, 12.93

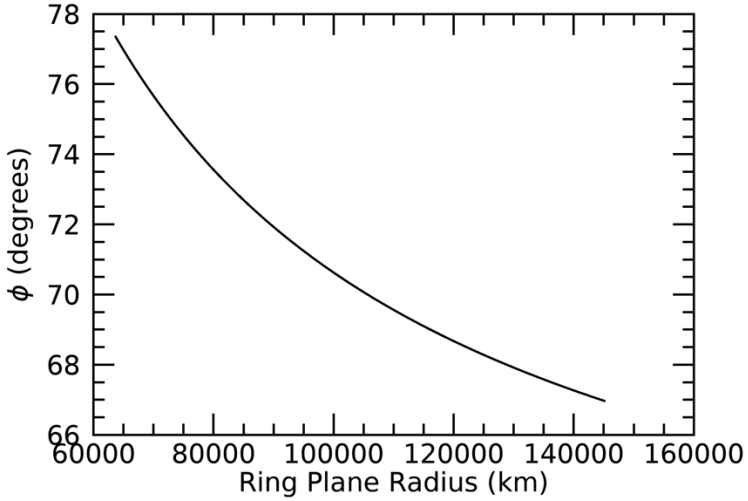
Sub−s/c lat/lon: 44.39, 54.07

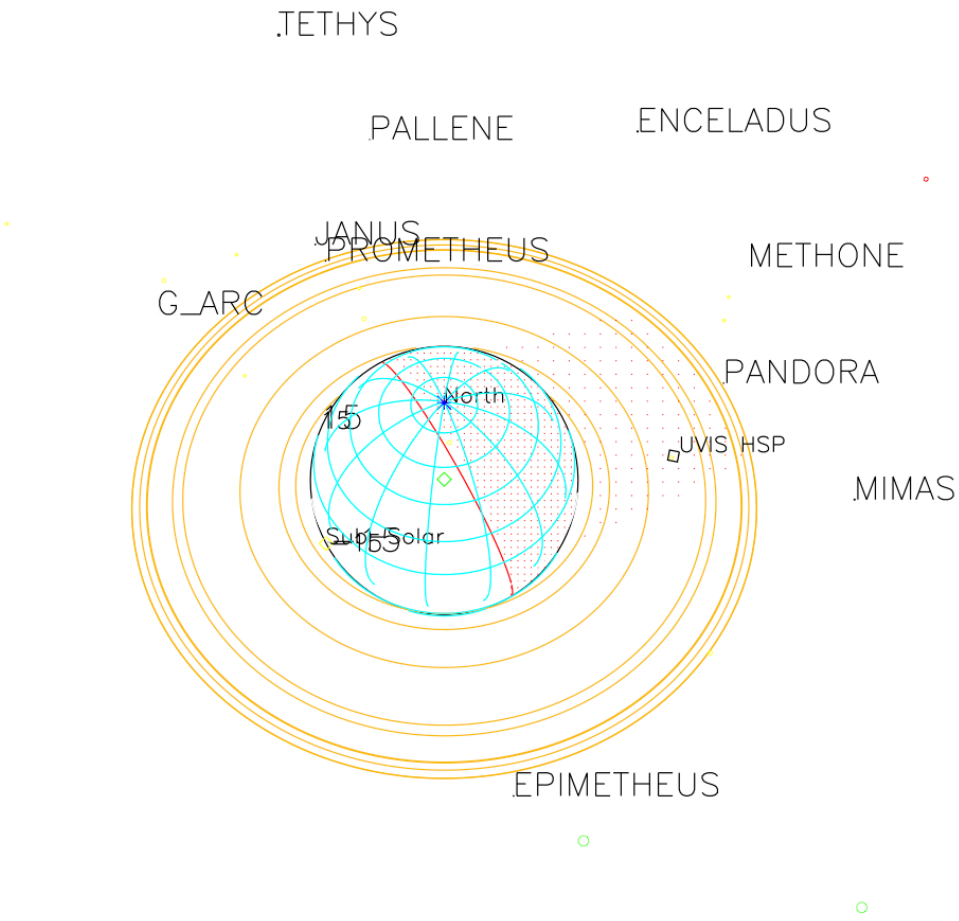
TETHYS


ZET CEN Rev 062 Egress
HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ZET CEN Rev 062 Egress
Radial Resolution (m)
9.20
9.15
9.10
9.05
9.00
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
78
76
74
72
70
68
66
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

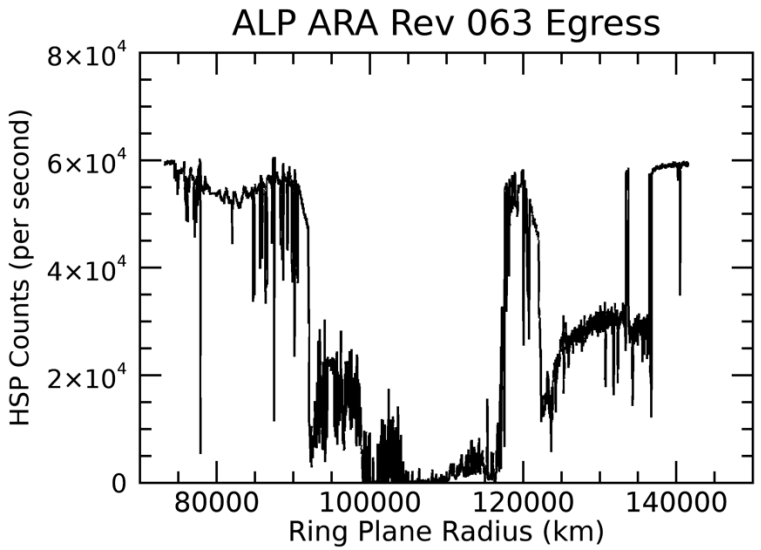


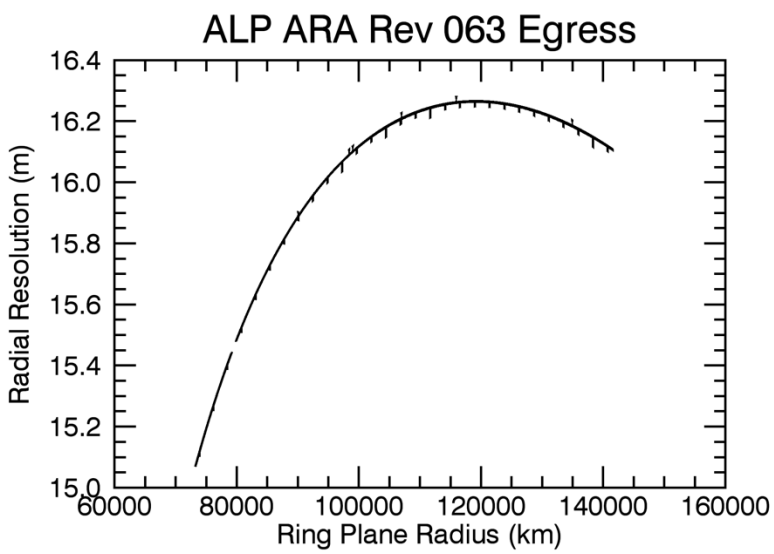
2008-082T13:43:00.000 728866.59 km

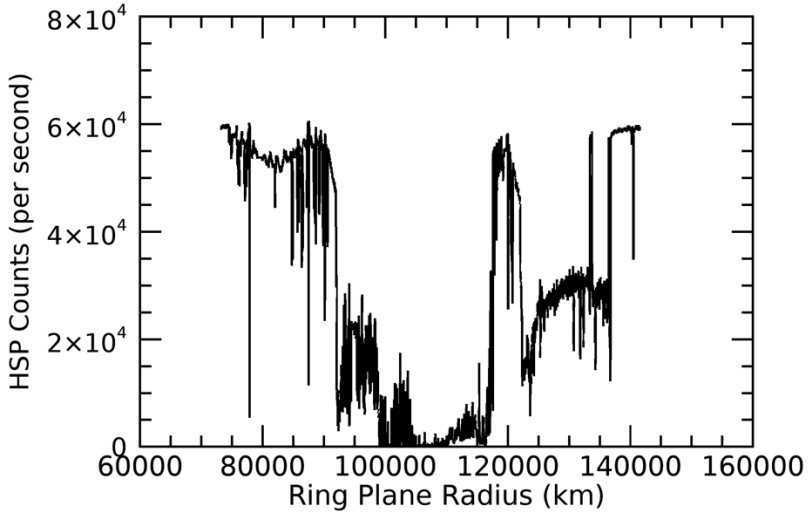
Target RA/dec: 220.75, -48.63

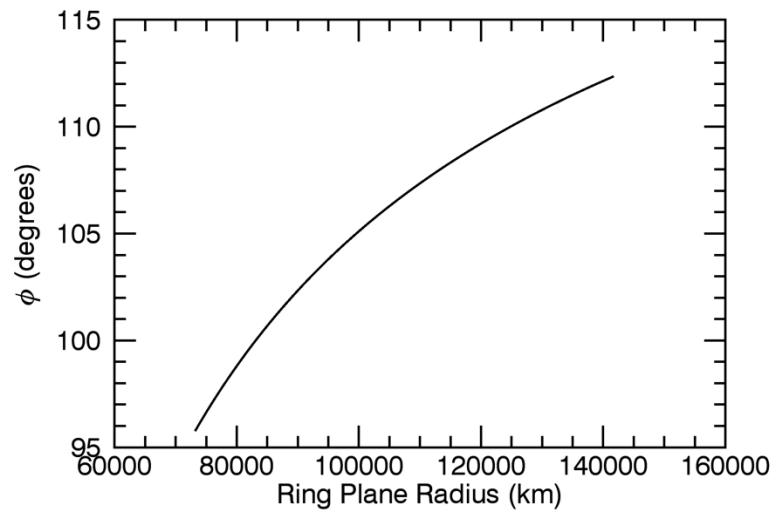
Subsolar lat/lon: -6.36, -22.81

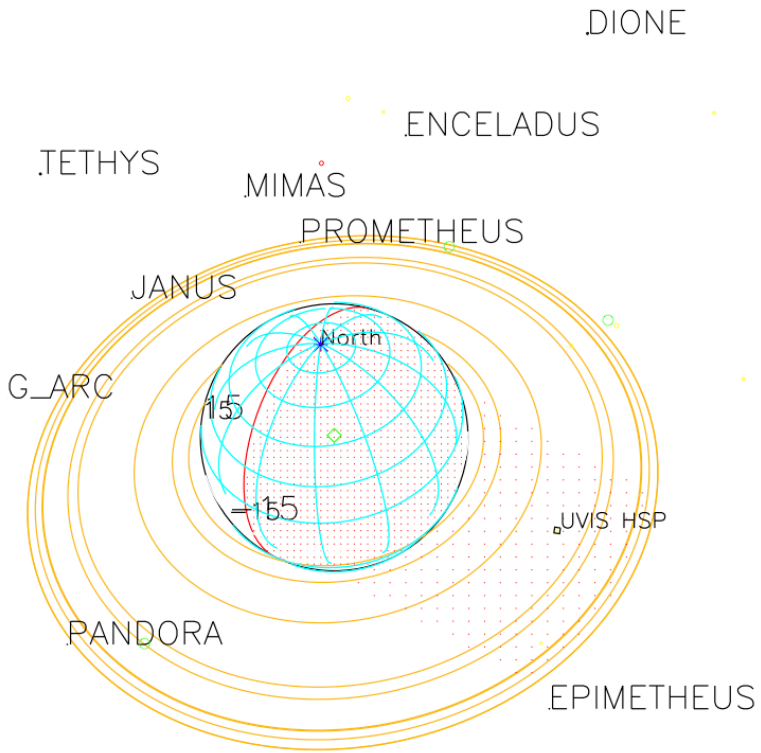
Sub-s/c lat/lon: 49.85, 38.62


ALP ARA Rev 063 Egress
HSP Counts (per second)
8×10^4
6×10^4
4×10^4
2×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 063 Egress
Radial Resolution (m)
16.4
16.2
16.0
15.8
15.6
15.4
15.2
15.0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
8×10^4
6×10^4
4×10^4
2×10^4
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
115
110
105
100
95
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

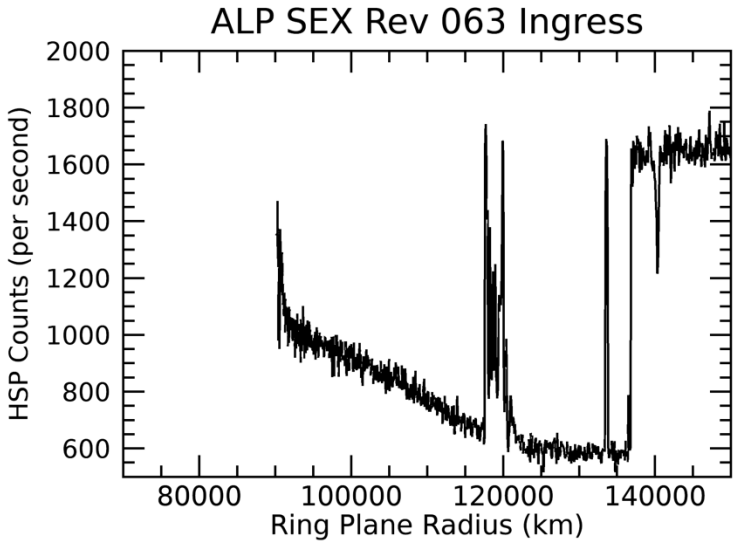


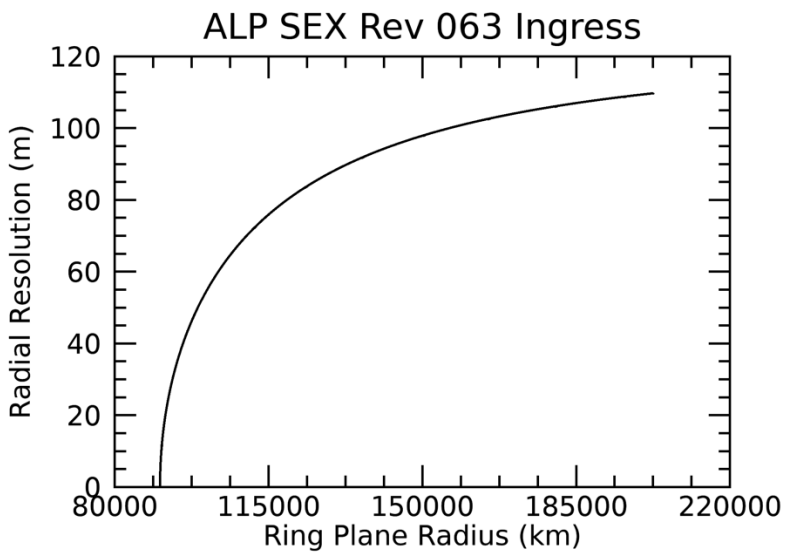
2008-092T11:01:00.000 407367.49 km

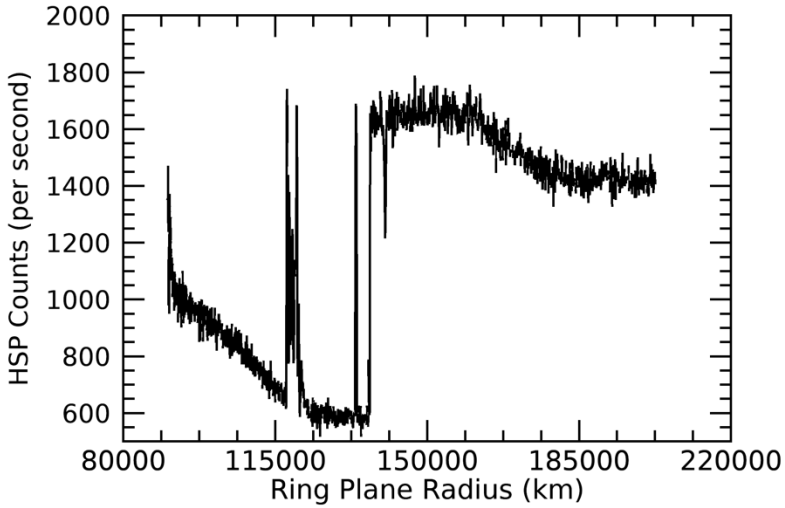
Target RA/dec: 284.75, -46.09

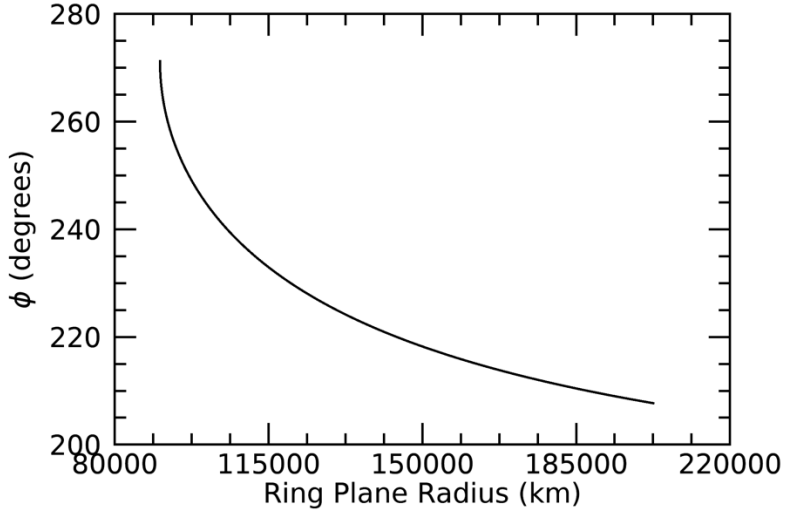
Subsolar lat/lon: -6.24, -119.23

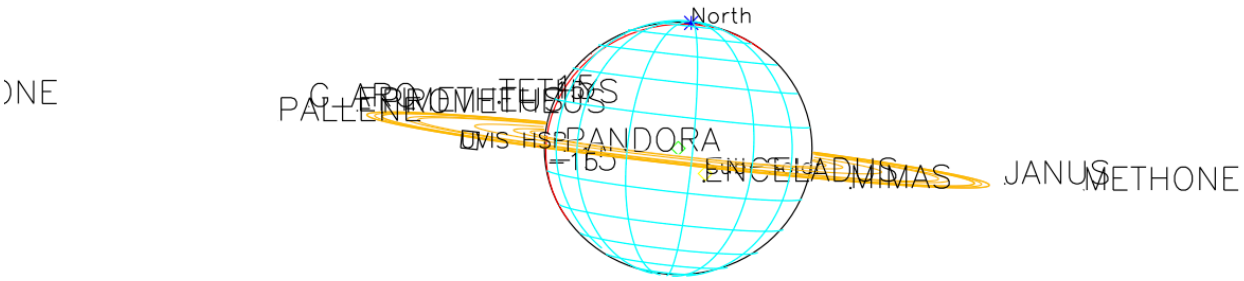
Sub-s/c lat/lon: 43.52, 12.35


ALP SEX Rev 063 Ingress
HSP Counts (per second)
2000
1800
1600
1400
1200
1000
800
600
80000
100000
120000
140000
Ring Plane Radius (km)


ALP SEX Rev 063 Ingress
Radial Resolution (m)
120
100
80
60
40
20
0
80000
115000
150000
185000
220000
Ring Plane Radius (km)


HSP Counts (per second)
2000
1800
1600
1400
1200
1000
800
600
80000
115000
150000
185000
220000
Ring Plane Radius (km)


ϕ (degrees)
280
260
240
220
200
80000
115000
150000
185000
220000
Ring Plane Radius (km)

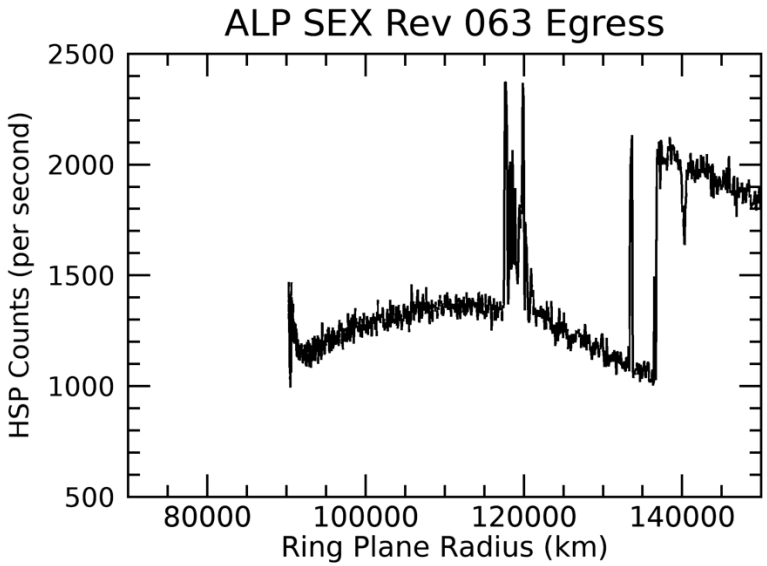


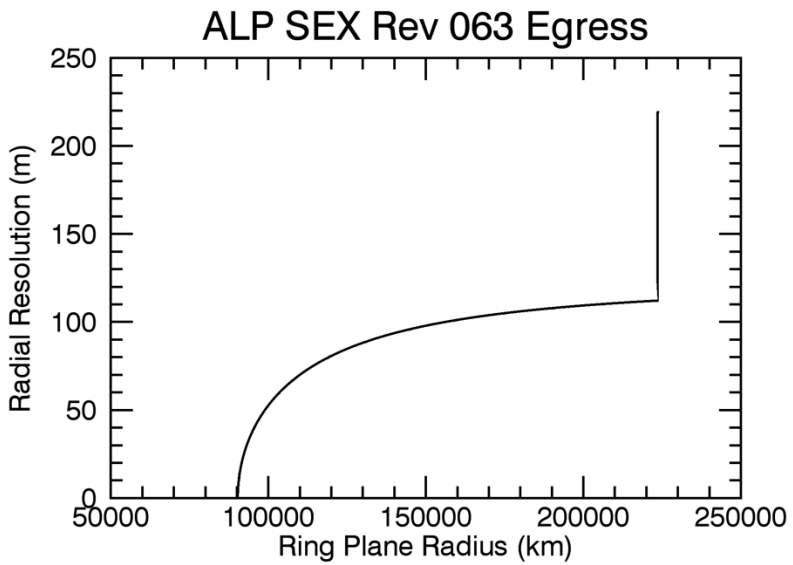
2008-095T09:55:00.000 1246634.0 km

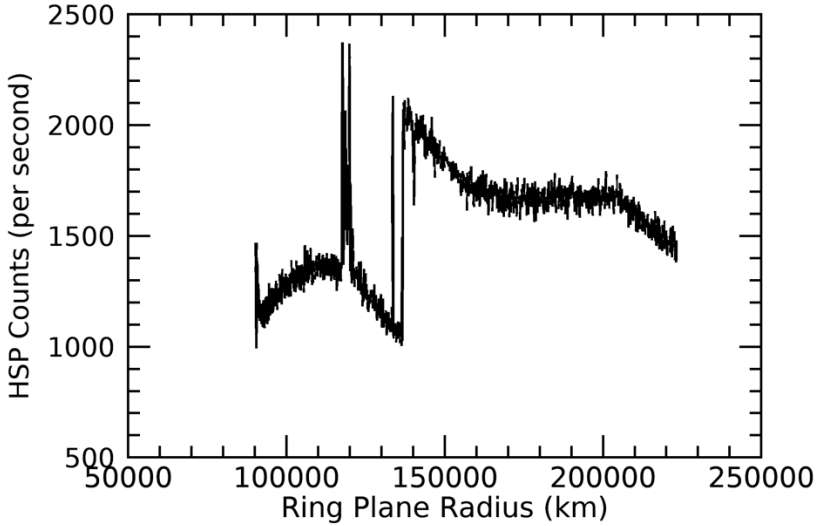
Target RA/dec: 147.74, -0.61

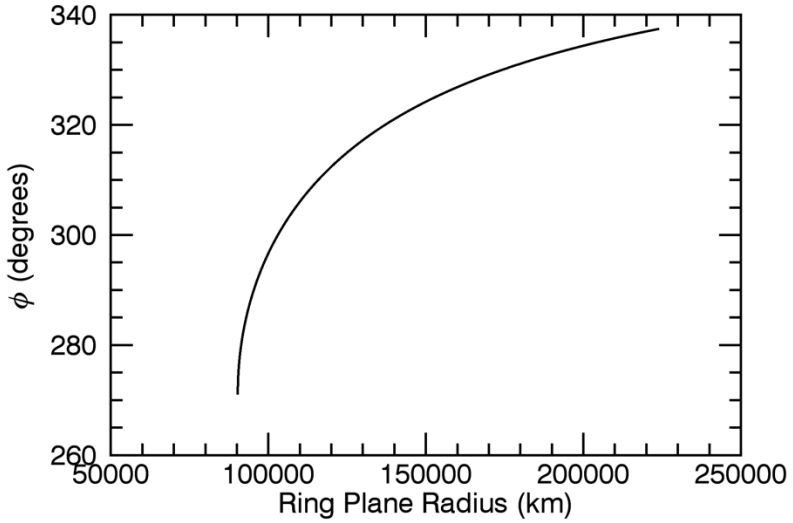
Subsolar lat/lon: -6.20, 5.68

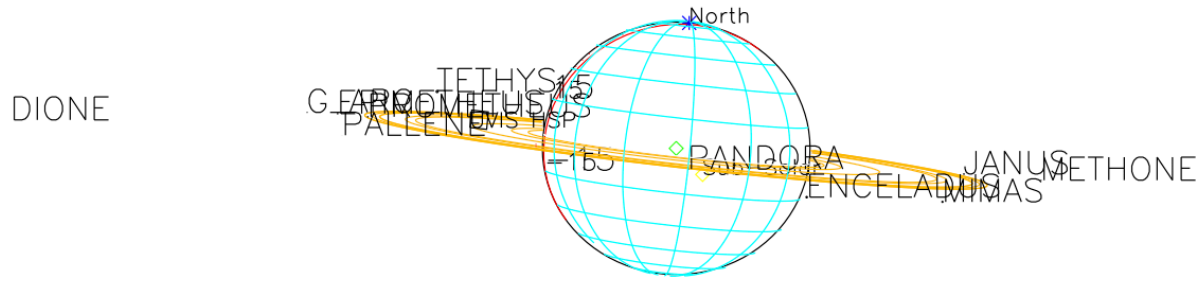
Sub-s/c lat/lon: 2.06, -6.51


ALP SEX Rev 063 Egress
HSP Counts (per second)
2500
2000
1500
1000
500
80000
100000
120000
140000
Ring Plane Radius (km)


ALP SEX Rev 063 Egress
Radial Resolution (m)
250
200
150
100
50
0
50000
100000
150000
200000
250000
Ring Plane Radius (km)


HSP Counts (per second)
2500
2000
1500
1000
500
50000
100000
150000
200000
250000
Ring Plane Radius (km)


ϕ (degrees)
340
320
300
280
260
50000
100000
150000
200000
250000
Ring Plane Radius (km)

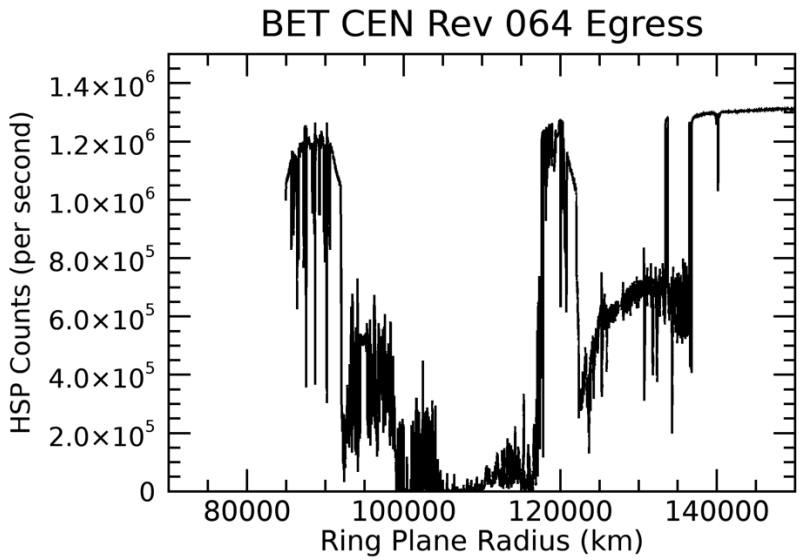


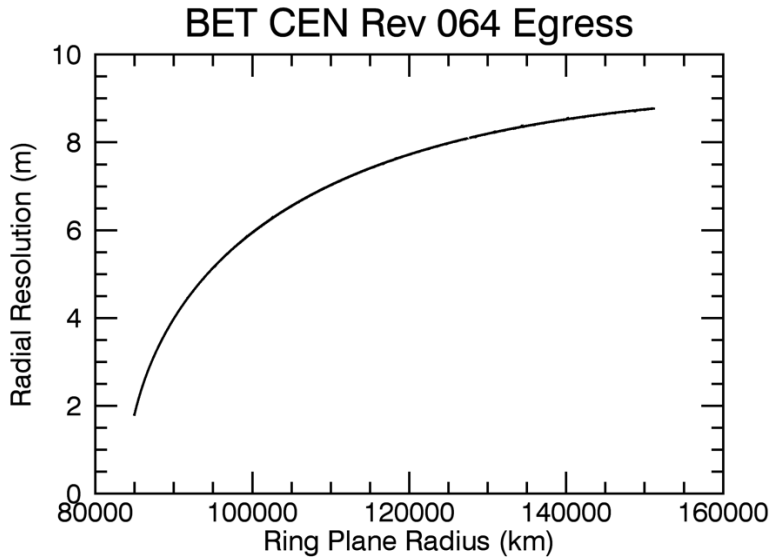
2008-095T10:48:00.000 1254639.3 km

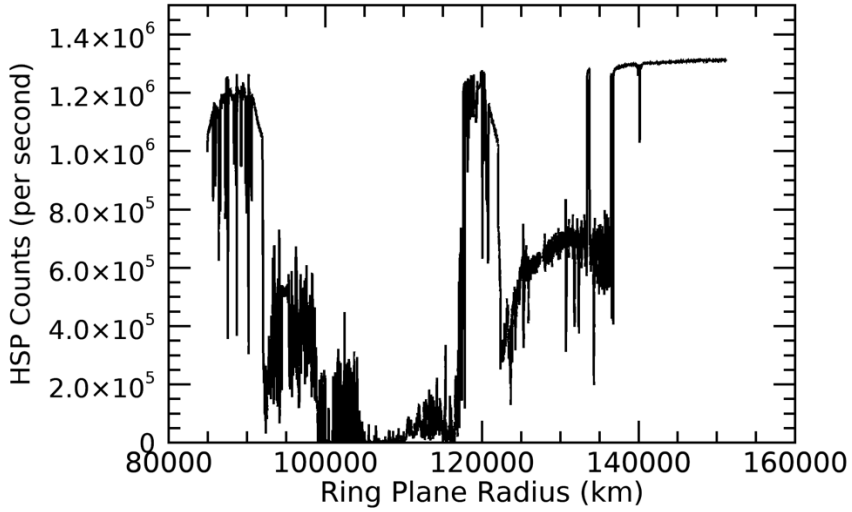
Target RA/dec: 148.00, -1.01

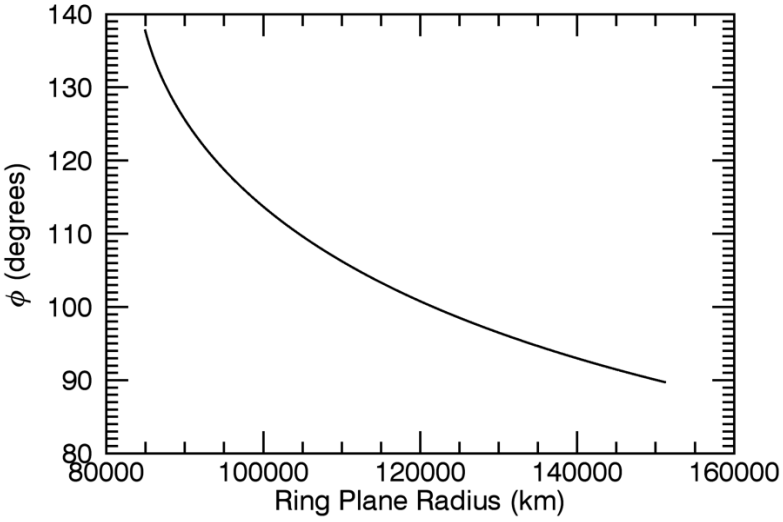
Subsolar lat/lon: -6.20, -24.16

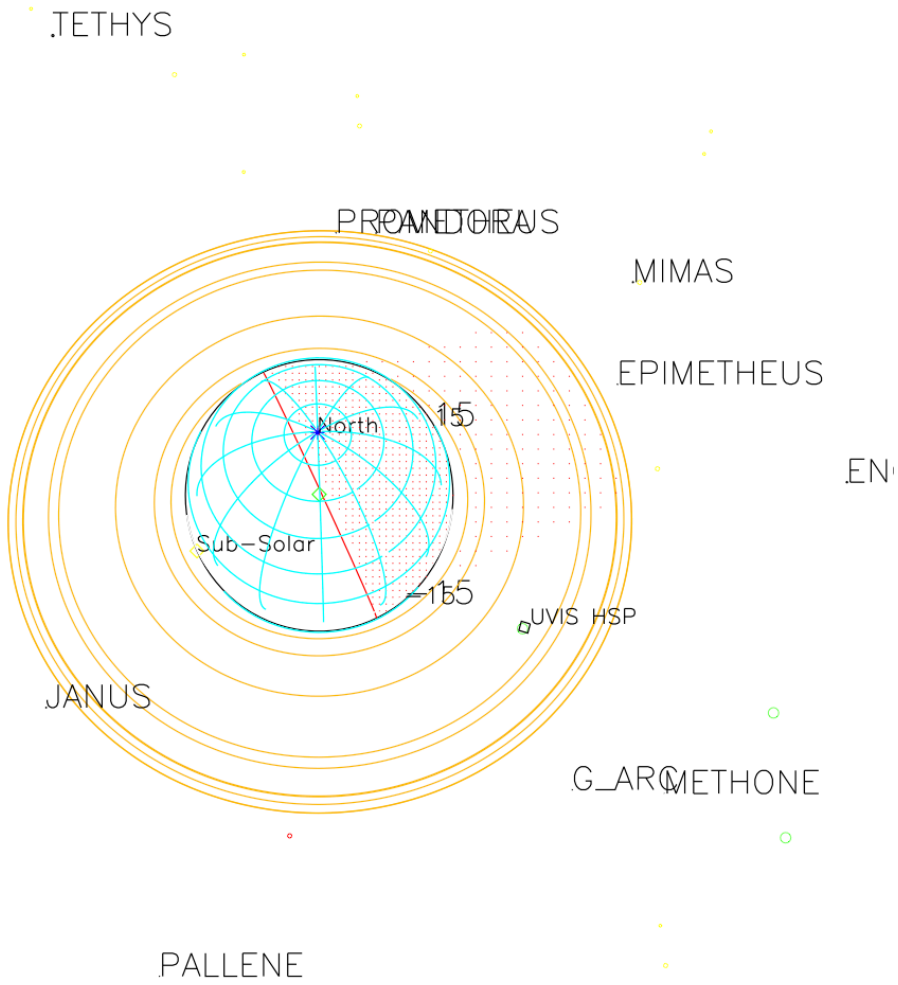
Sub-s/c lat/lon: 2.41, -36.14


BET CEN Rev 064 Egress
HSP Counts (per second)
1.4×10^6
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 064 Egress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
1.4×10^6
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


φ (degrees)
140
130
120
110
100
90
80
80000
100000
120000
140000
160000
Ring Plane Radius (km)

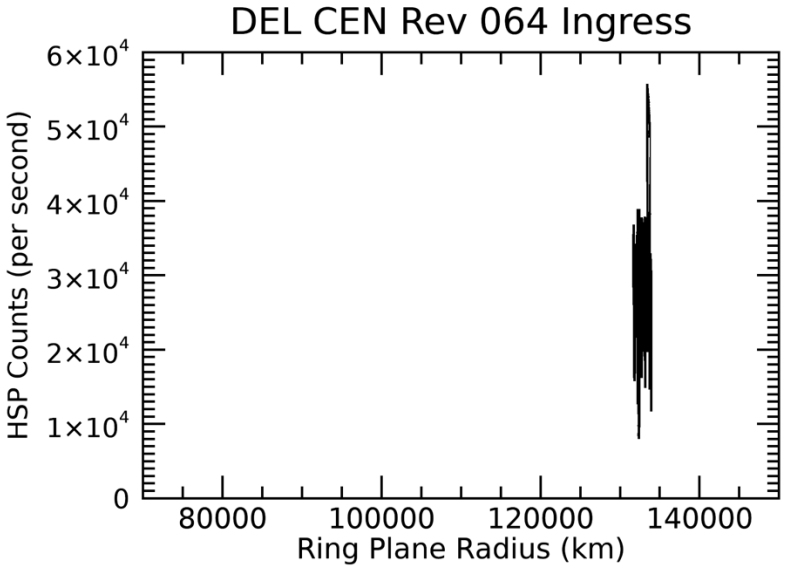


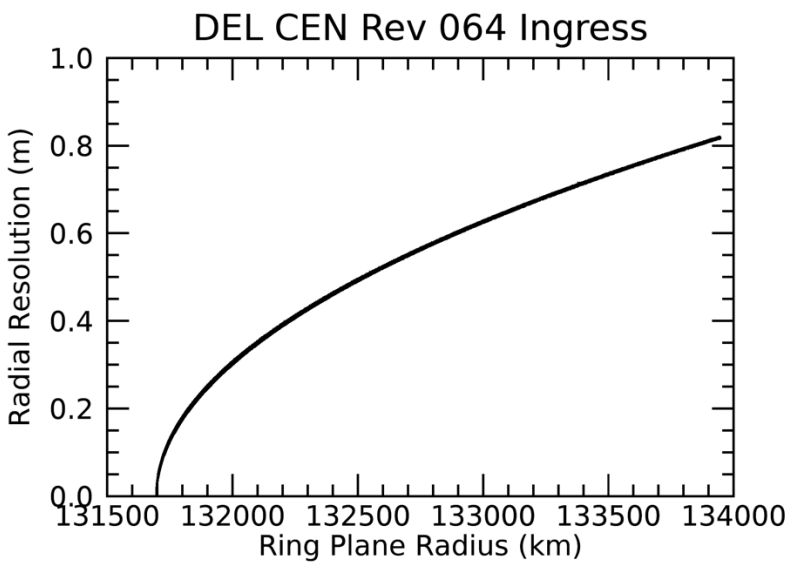
2008−101T12:52:00.000 676601.19 km

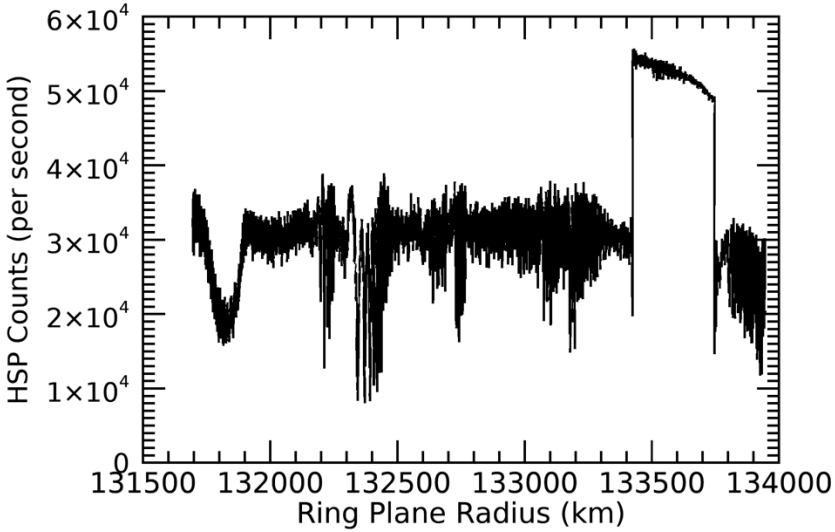
Target RA/dec: 226.69, −56.40

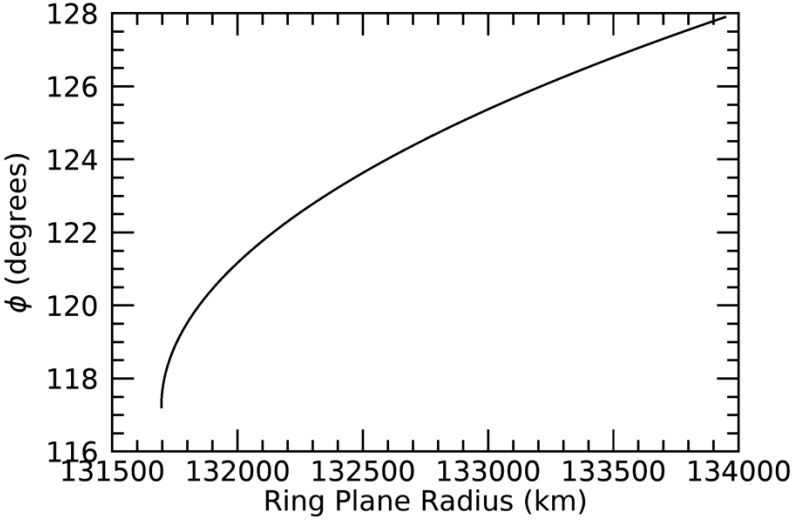
Subsolar lat/lon: −6.13, 81.43

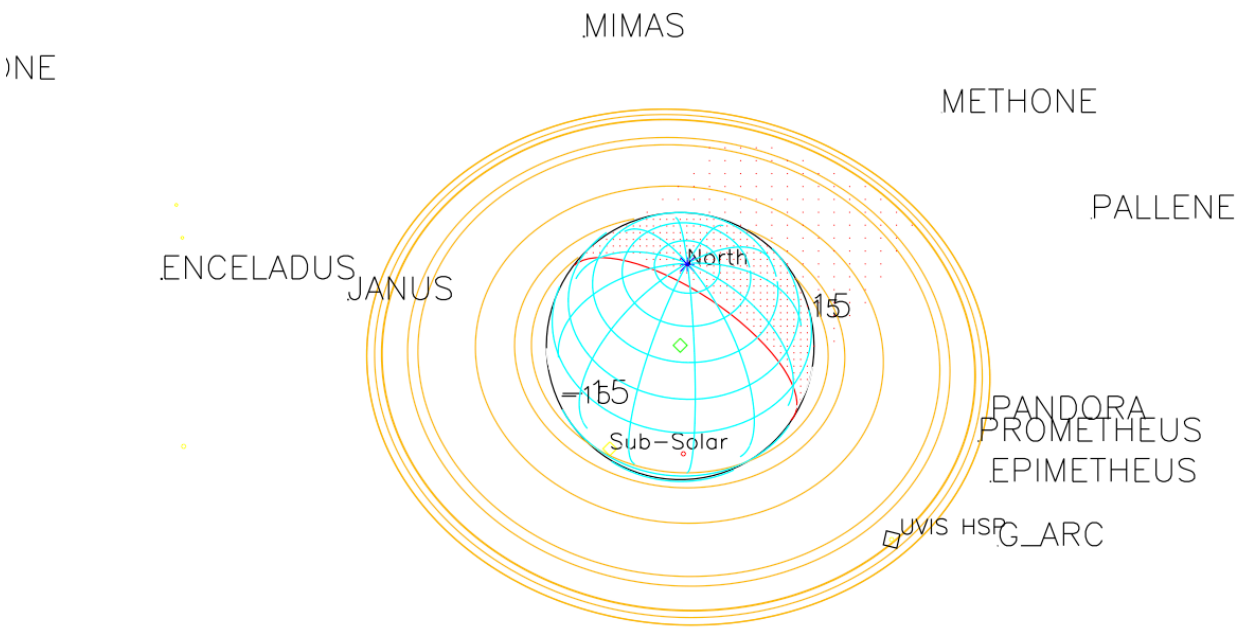
Sub−s/c lat/lon: 58.20, 149.47


DEL CEN Rev 064 Ingress
HSP Counts (per second)
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


DEL CEN Rev 064 Ingress
Radial Resolution (m)
1.0
0.8
0.6
0.4
0.2
0.0
131500
132000
132500
133000
133500
134000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
131500
132000
132500
133000
133500
134000
Ring Plane Radius (km)


ϕ (degrees)
128
126
124
122
120
118
116
131500
132000
132500
133000
133500
134000
Ring Plane Radius (km)

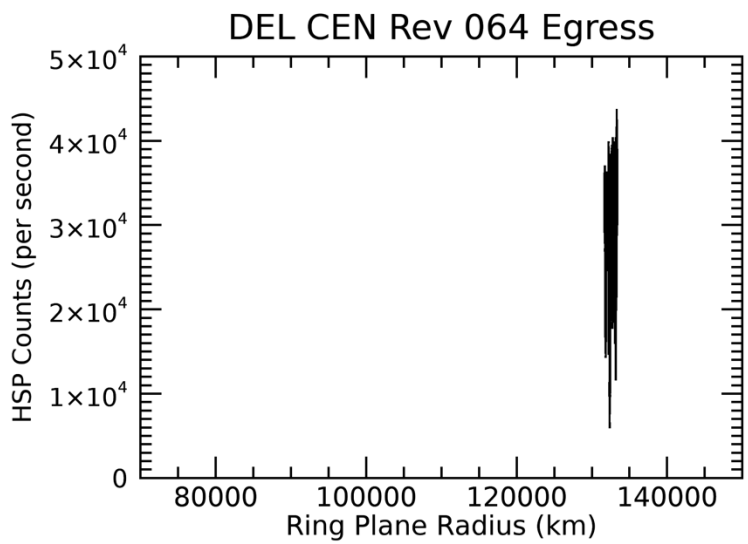


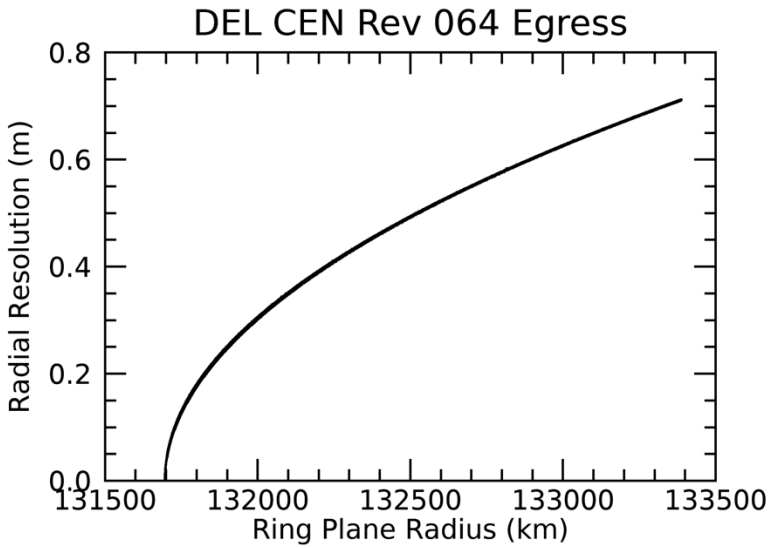
2008−100T16:23:00.000 1021707.9 km

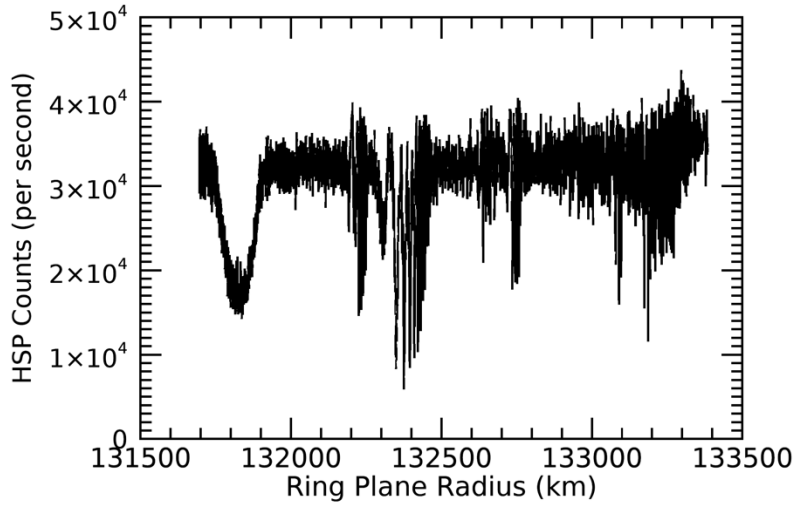
Target RA/dec: 190.50, −46.34

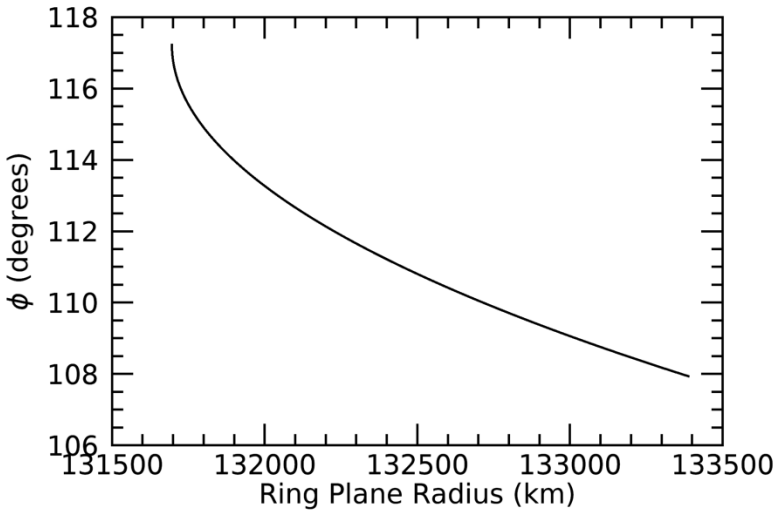
Subsolar lat/lon: −6.14, 53.40

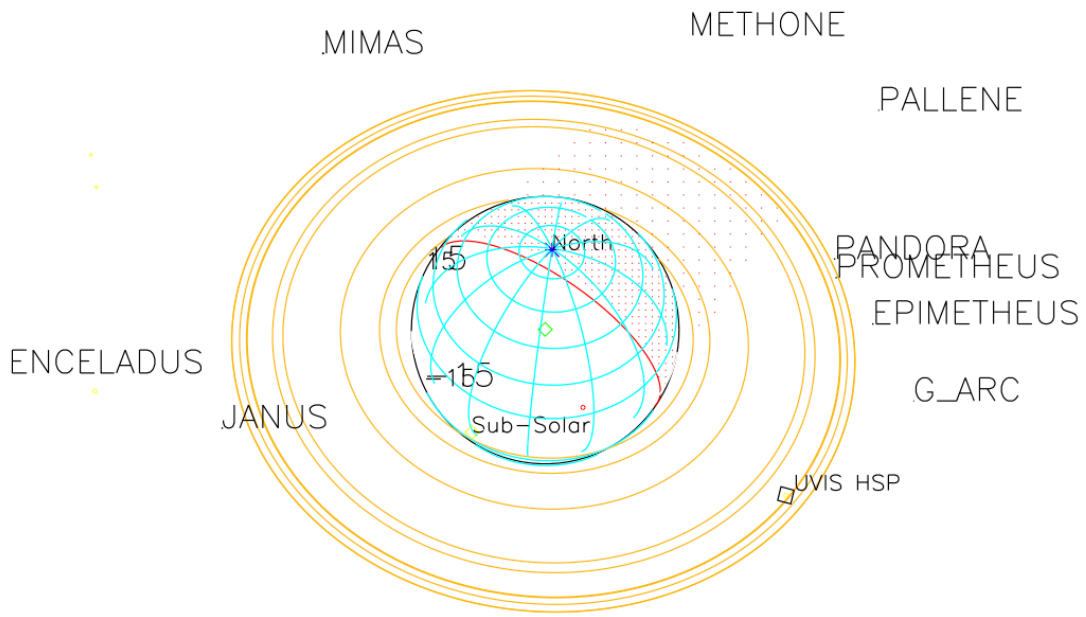
Sub−s/c lat/lon: 46.31, 80.02


DEL CEN Rev 064 Egress
HSP Counts (per second)
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


DEL CEN Rev 064 Egress
Radial Resolution (m)
0.8
0.6
0.4
0.2
0.0
131500
132000
132500
133000
133500
Ring Plane Radius (km)


HSP Counts (per second)
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
131500
132000
132500
133000
133500
Ring Plane Radius (km)


ϕ (degrees)
118
116
114
112
110
108
106
131500
132000
132500
133000
133500
Ring Plane Radius (km)

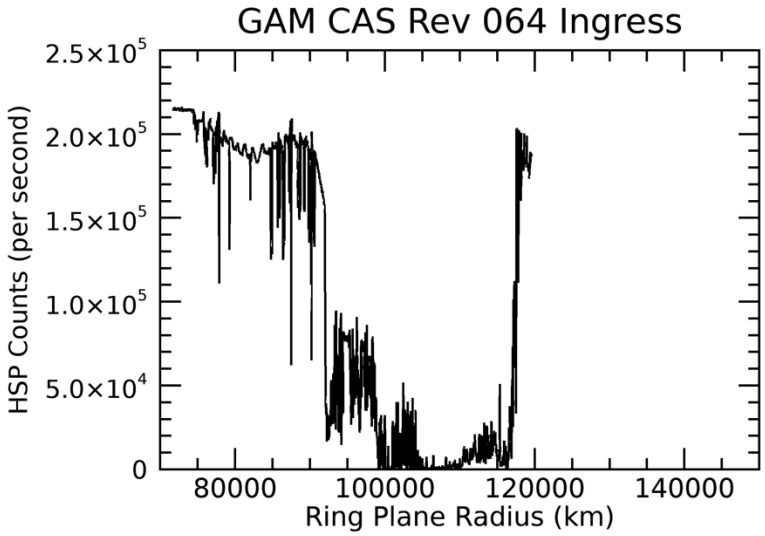


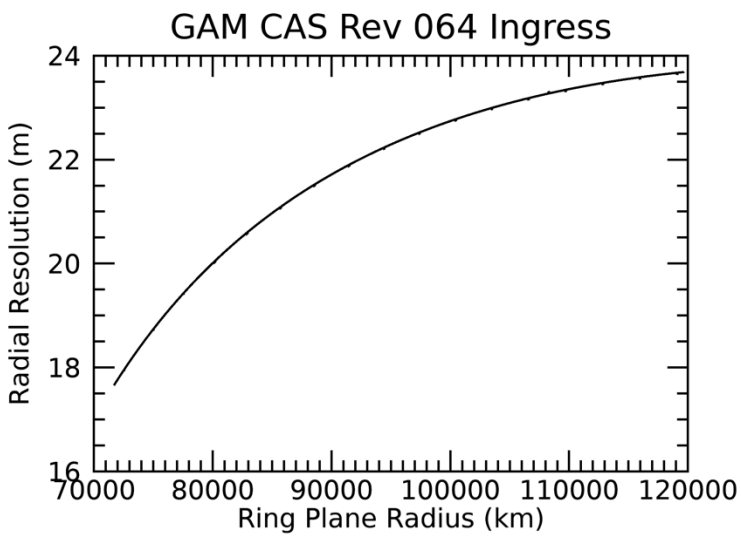
2008-100T17:48:00.000 1001958.0 km

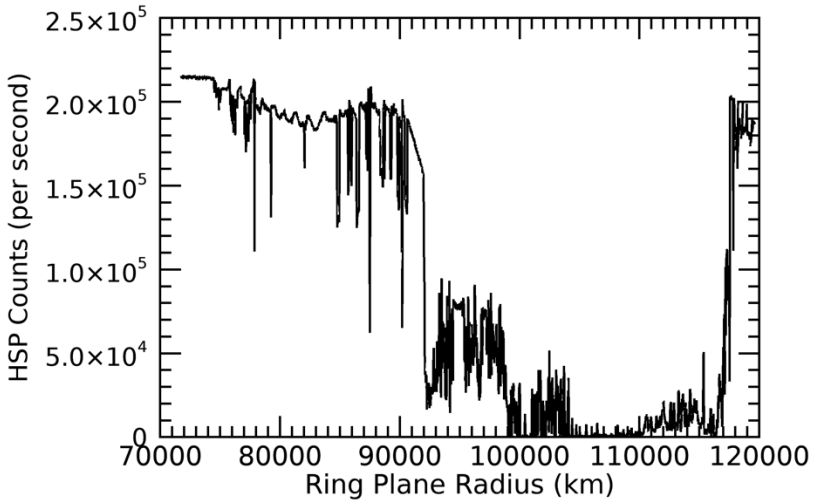
Target RA/dec: 191.86, -47.04

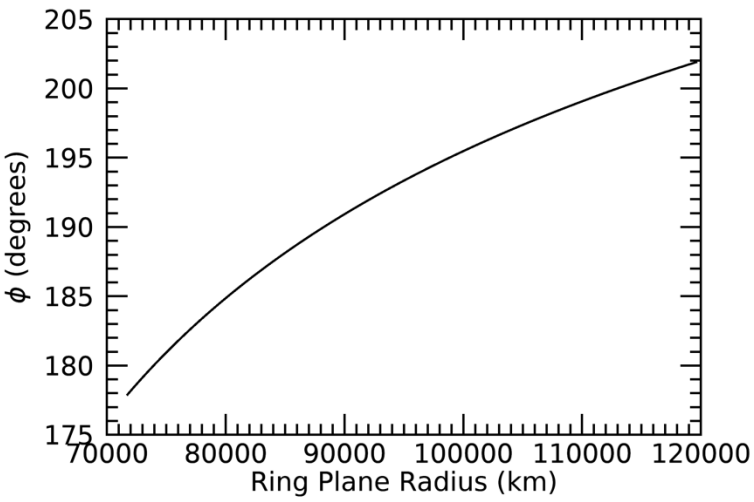
Subsolar lat/lon: -6.14, 5.55

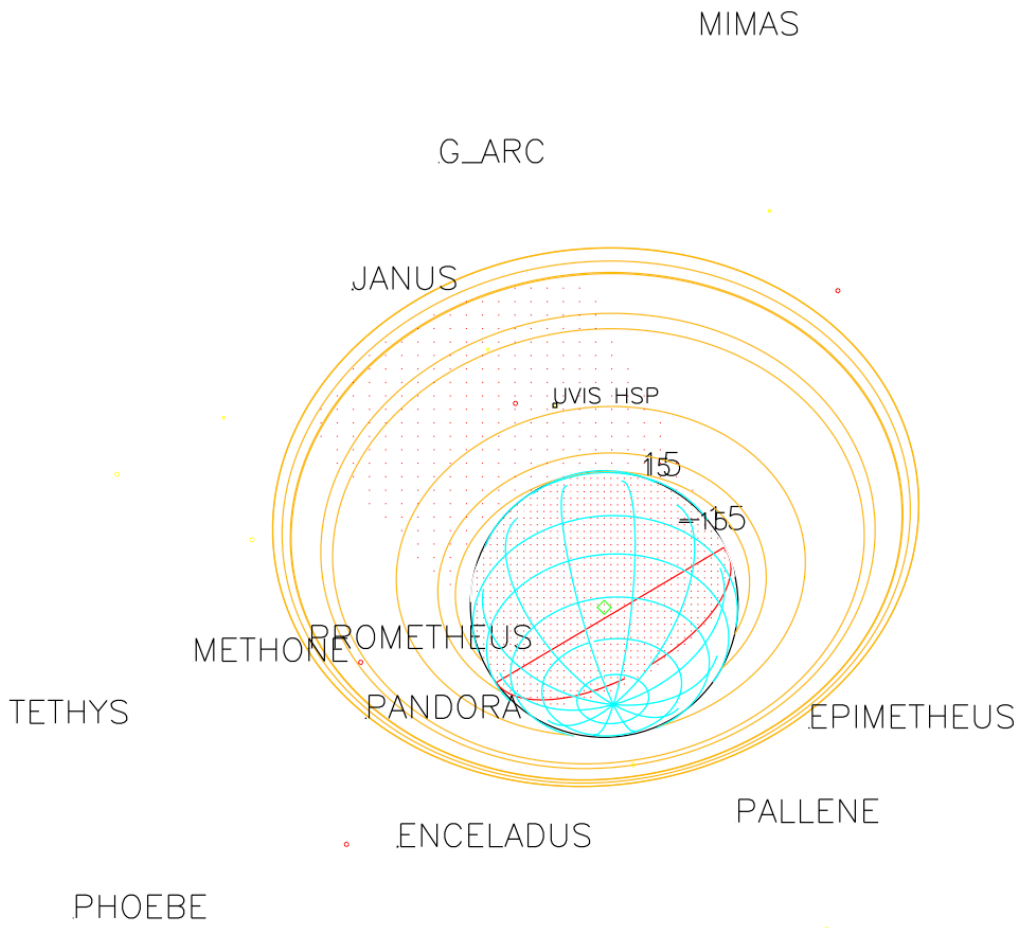
Sub-s/c lat/lon: 47.13, 33.57


GAM CAS Rev 064 Ingress
HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


GAM CAS Rev 064 Ingress
Radial Resolution (m)
24
22
20
18
16
70000
80000
90000
100000
110000
120000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
70000
80000
90000
100000
110000
120000
Ring Plane Radius (km)


ϕ (degrees)
205
200
195
190
185
180
175
70000
80000
90000
100000
110000
120000
Ring Plane Radius (km)

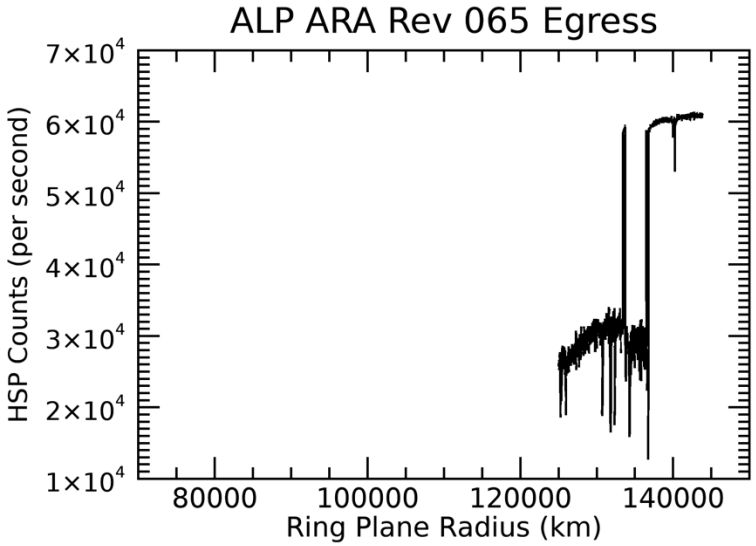


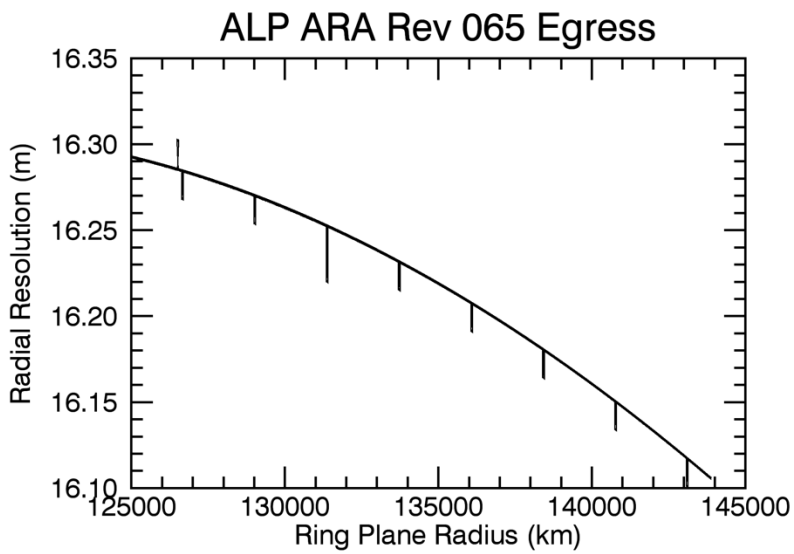
2008-102T12:48:00.000 276103.10 km

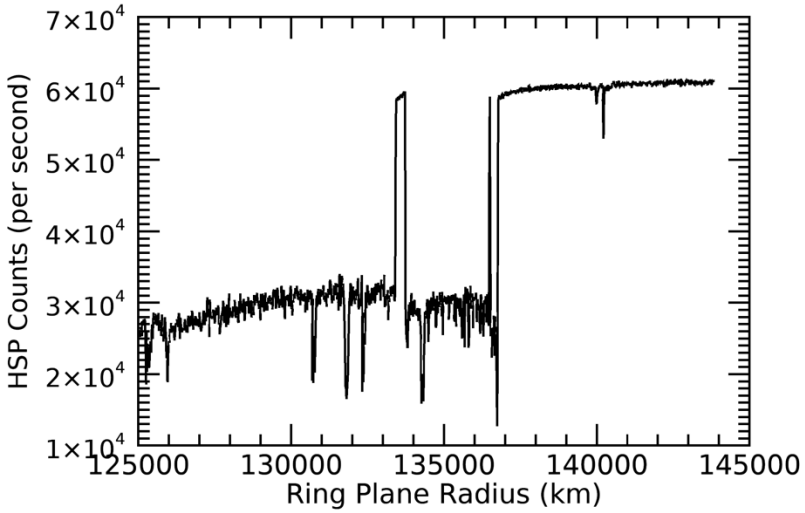
Target RA/dec: 5.15, 43.22

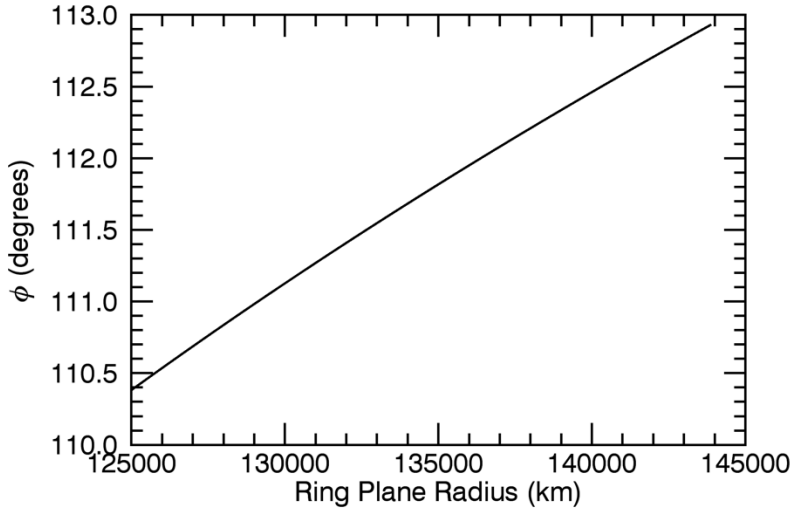
Subsolar lat/lon: -6.11, -7.09

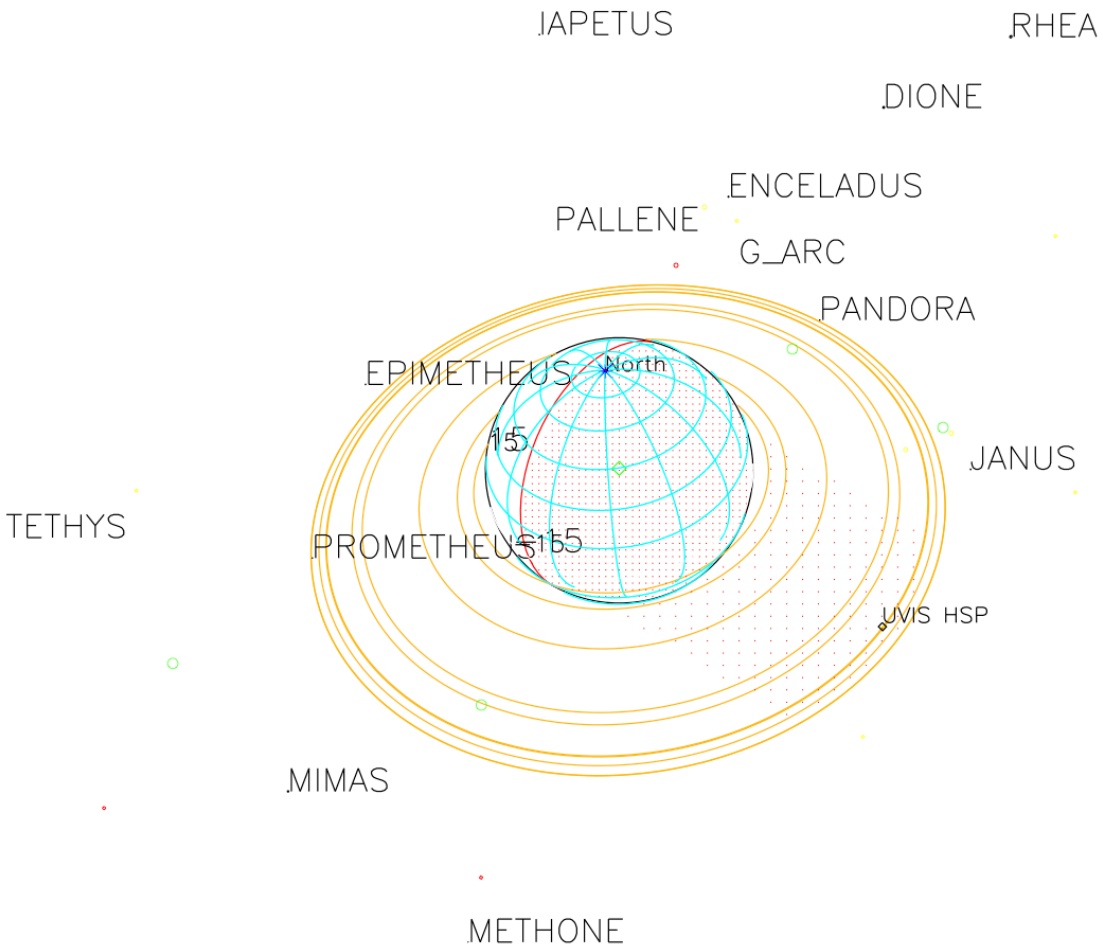
Sub-s/c lat/lon: -43.69, -165.97


ALP ARA Rev 065 Egress
HSP Counts (per second)
7×10^4
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 065 Egress
Radial Resolution (m)
16.35
16.30
16.25
16.20
16.15
16.10
125000
130000
135000
140000
145000
Ring Plane Radius (km)


HSP Counts (per second)
7×10^4
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
125000
130000
135000
140000
145000
Ring Plane Radius (km)


ϕ (degrees)
113.0
112.5
112.0
111.5
111.0
110.5
110.0
125000
130000
135000
140000
145000
Ring Plane Radius (km)

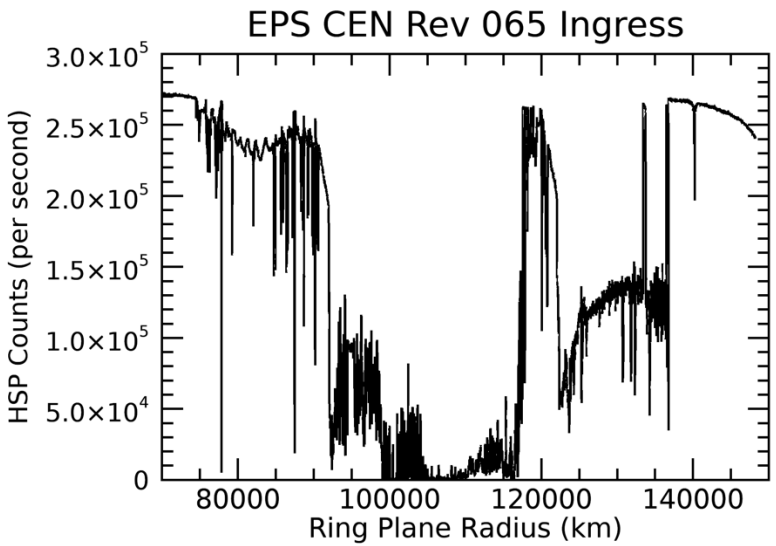


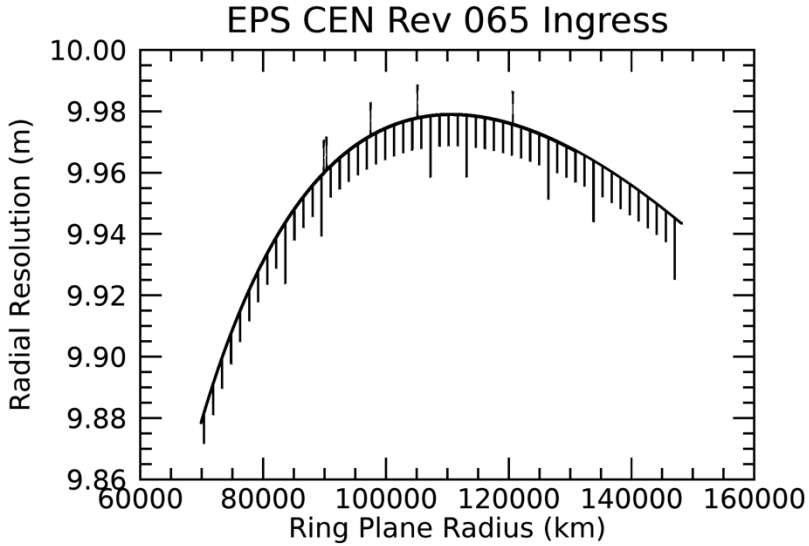
2008-111T15:19:00.000 385838.77 km

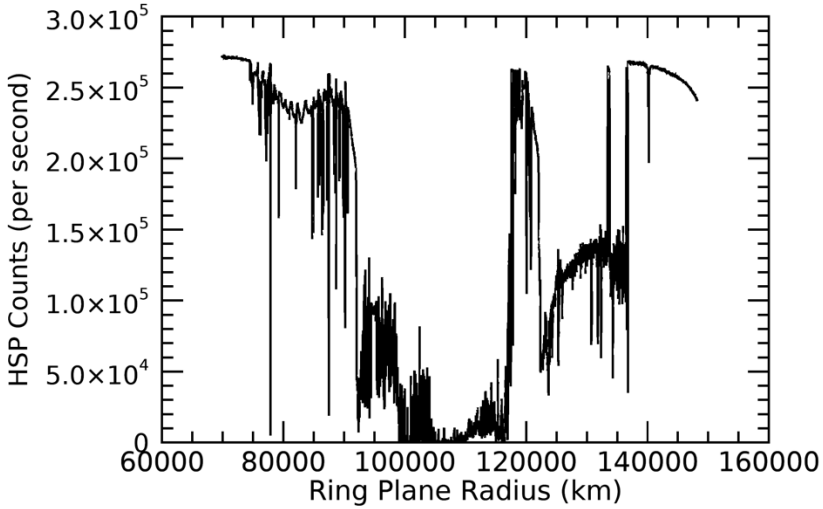
Target RA/dec: 289.96, -42.86

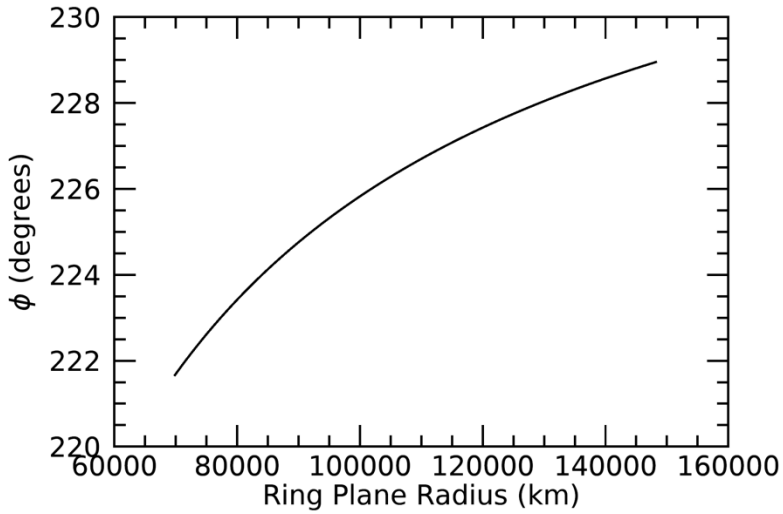
Subsolar lat/lon: -6.00, 171.04

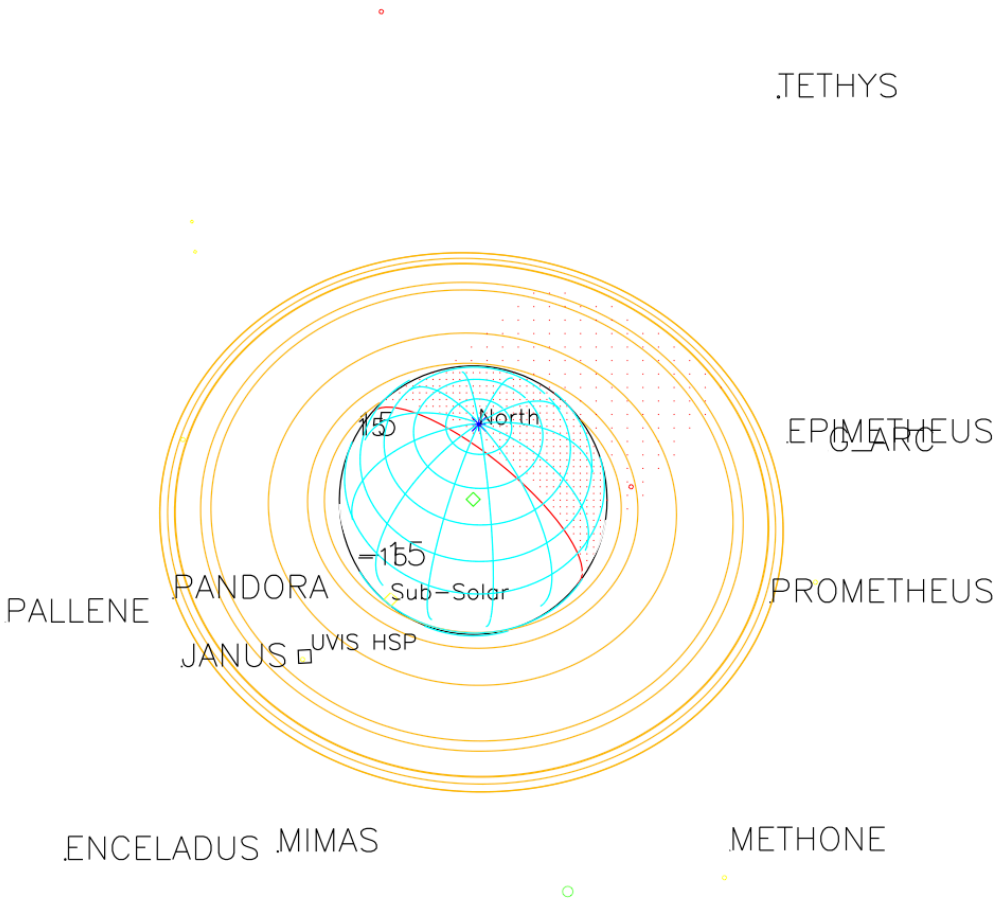
Sub-s/c lat/lon: 39.82, -53.35


EPS CEN Rev 065 Ingress
HSP Counts (per second)
3.0×10^5
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


EPS CEN Rev 065 Ingress
Radial Resolution (m)
10.00
9.98
9.96
9.94
9.92
9.90
9.88
9.86
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
3.0×10^5
2.5×10^5
2.0×10^5
1.5×10^5
1.0×10^5
5.0×10^4
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
230
228
226
224
222
220
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

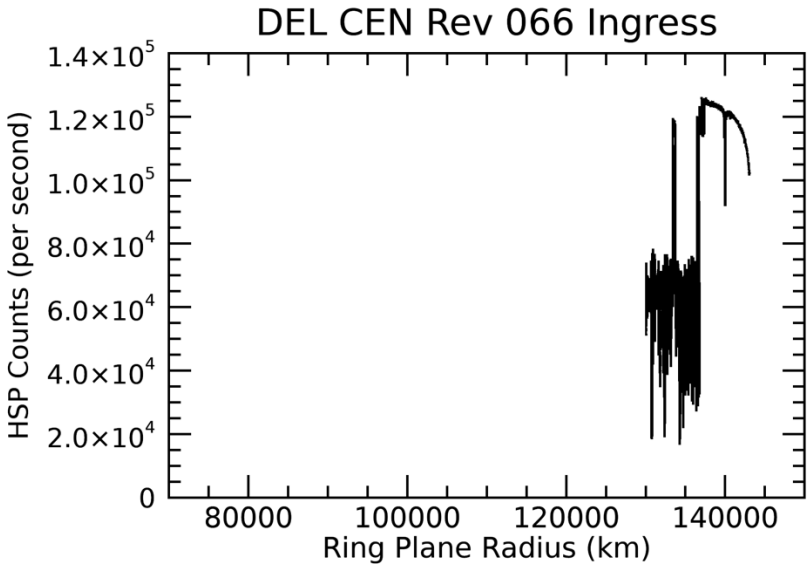


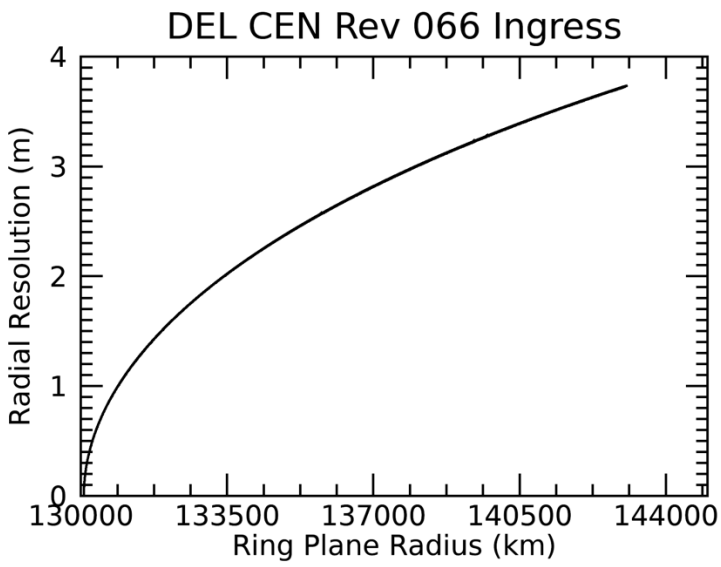
2008-110T11:59:00.000 931476.84 km

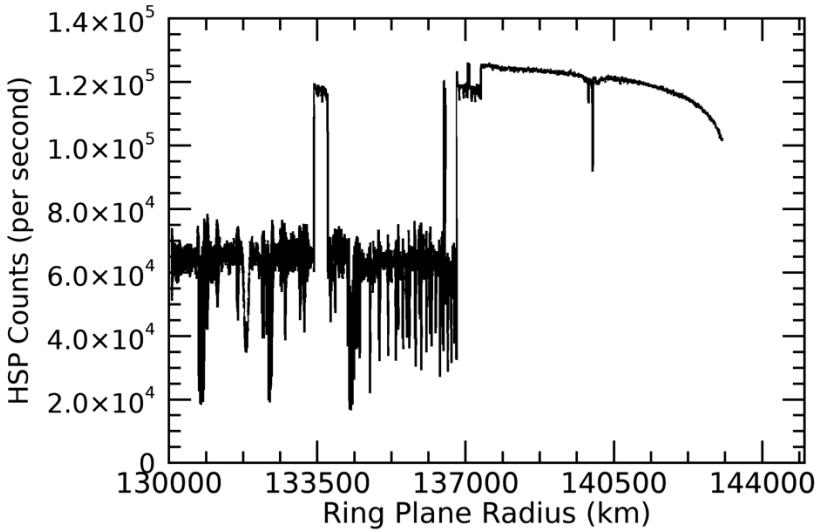
Target RA/dec: 197.05, -49.49

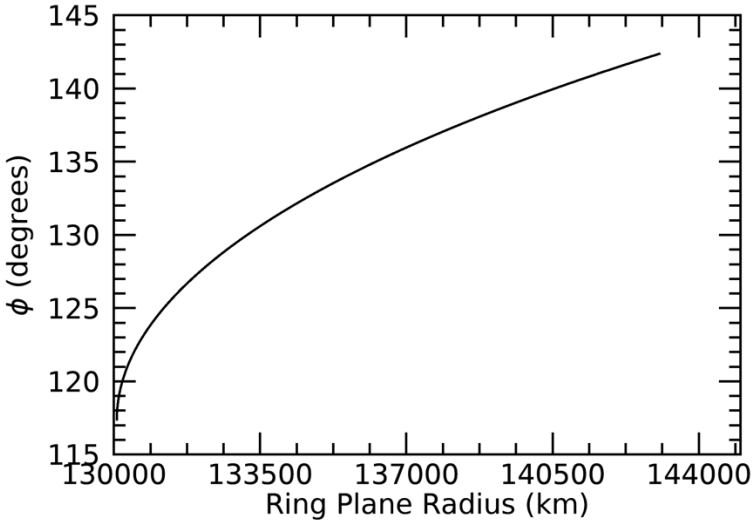
Subsolar lat/lon: -6.01, 14.42

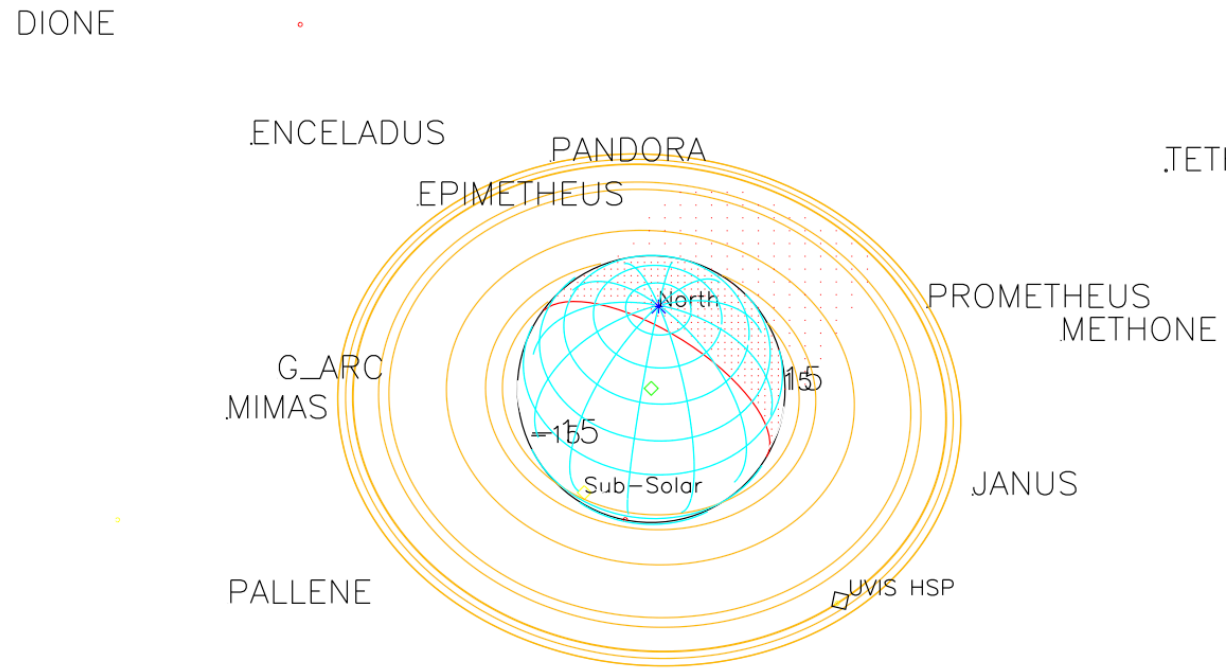
Sub-s/c lat/lon: 50.00, 47.63


DEL CEN Rev 066 Ingress
HSP Counts (per second)
1.4×10^5
1.2×10^5
1.0×10^5
8.0×10^4
6.0×10^4
4.0×10^4
2.0×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


DEL CEN Rev 066 Ingress
Radial Resolution (m)
4
3
2
1
0
130000
133500
137000
140500
144000
Ring Plane Radius (km)


HSP Counts (per second)
1.4×10^5
1.2×10^5
1.0×10^5
8.0×10^4
6.0×10^4
4.0×10^4
2.0×10^4
0
130000
133500
137000
140500
144000
Ring Plane Radius (km)


ϕ (degrees)
145
140
135
130
125
120
115
130000
133500
137000
140500
144000
Ring Plane Radius (km)

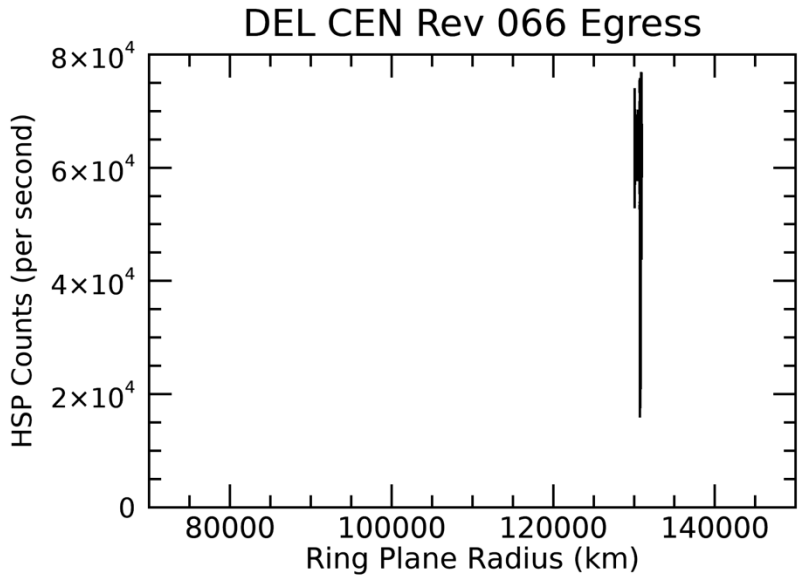


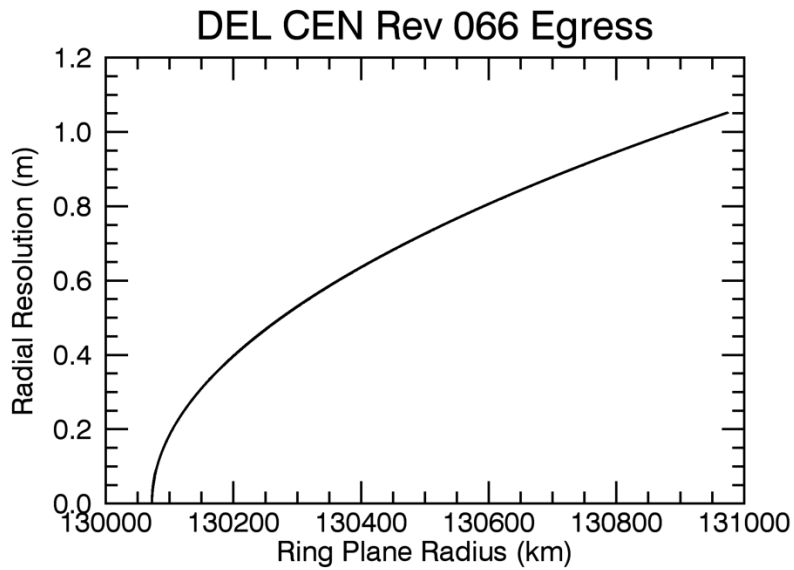
2008−119T18:05:00.000 1034455.9 km

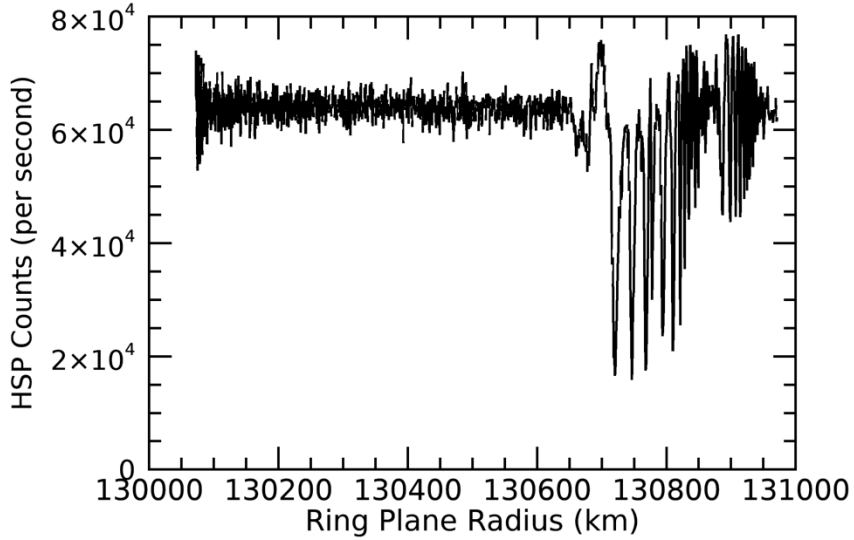
Target RA/dec: 189.40, −45.83

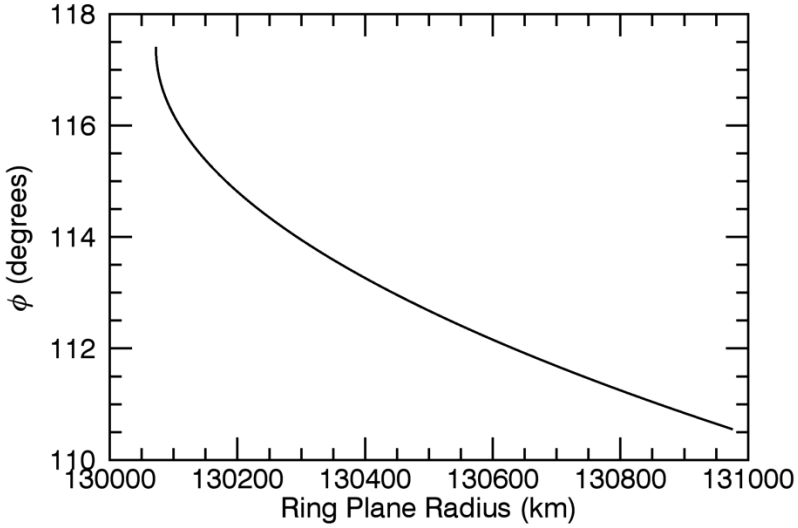
Subsolar lat/lon: −5.90, 71.50

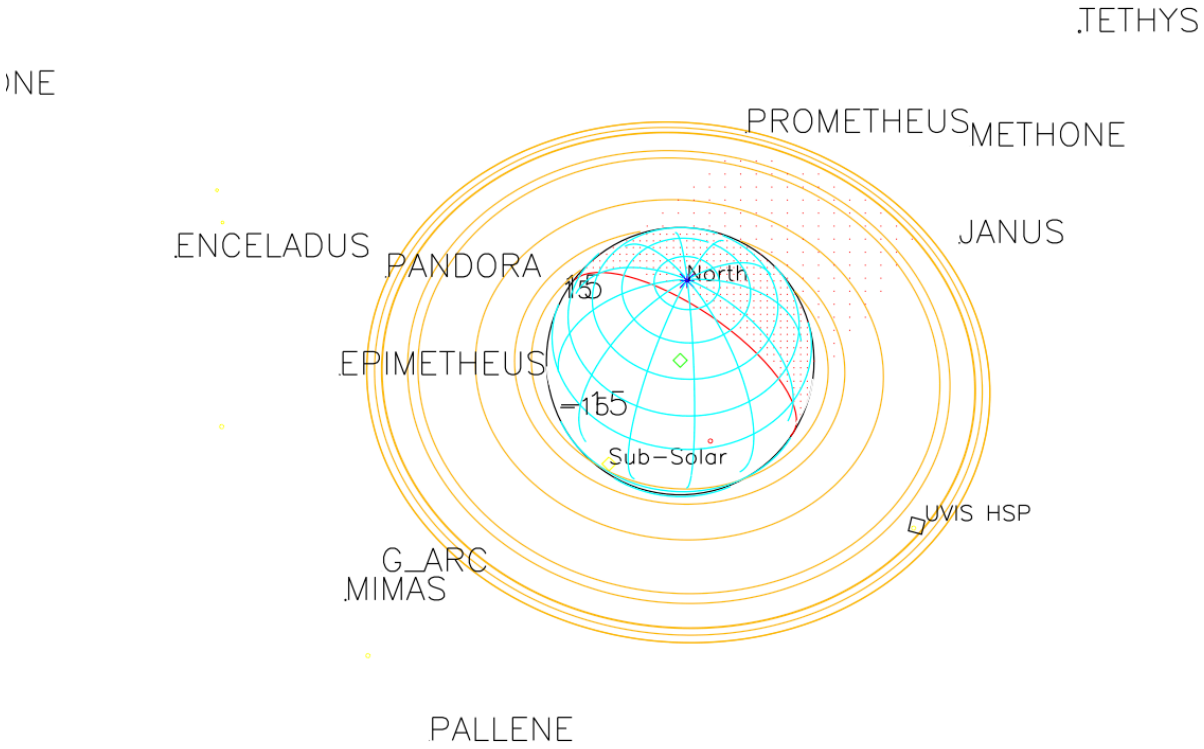
Sub−s/c lat/lon: 45.72, 96.35


DEL CEN Rev 066 Egress
HSP Counts (per second)
8×10^4
6×10^4
4×10^4
2×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


DEL CEN Rev 066 Egress
Radial Resolution (m)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
130000
130200
130400
130600
130800
131000
Ring Plane Radius (km)


HSP Counts (per second)
8×10^4
6×10^4
4×10^4
2×10^4
0
130000
130200
130400
130600
130800
131000
Ring Plane Radius (km)


ϕ (degrees)
118
116
114
112
110
130000
130200
130400
130600
130800
131000
Ring Plane Radius (km)

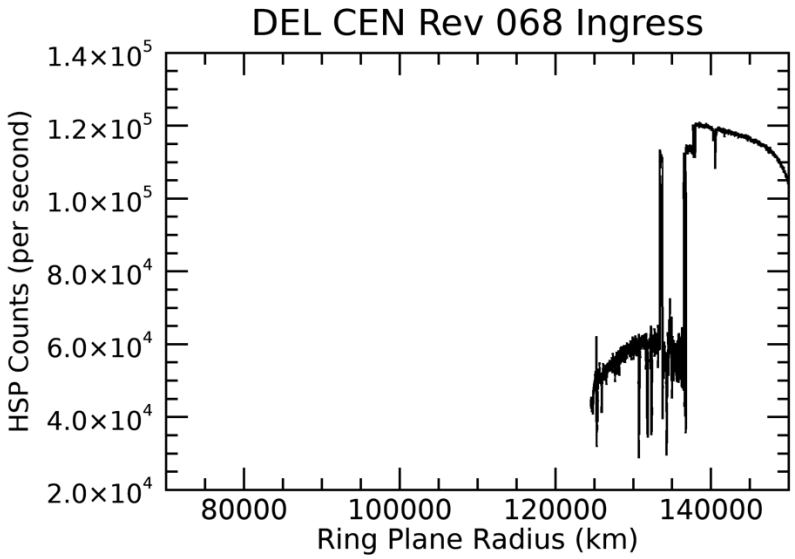


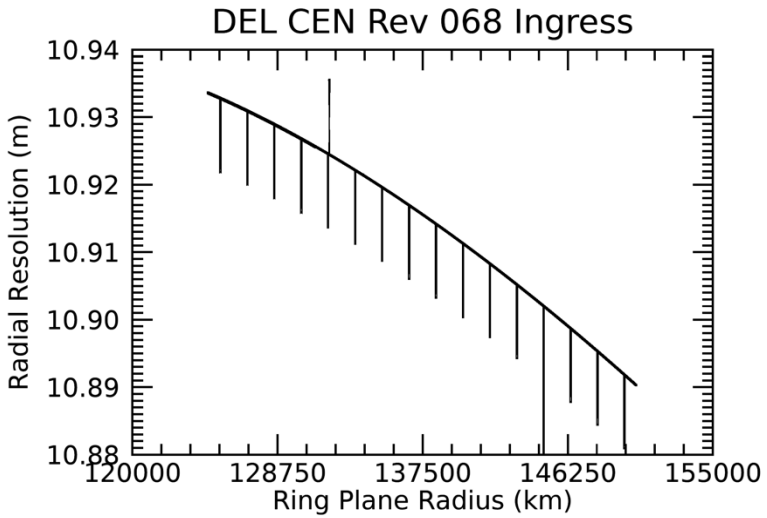
2008−119T20:24:00.000 1002507.7 km

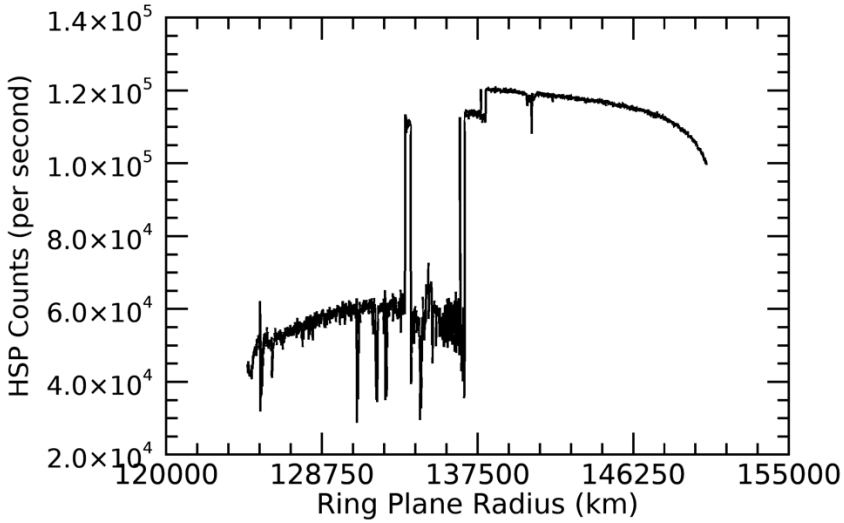
Target RA/dec: 191.56, −46.98

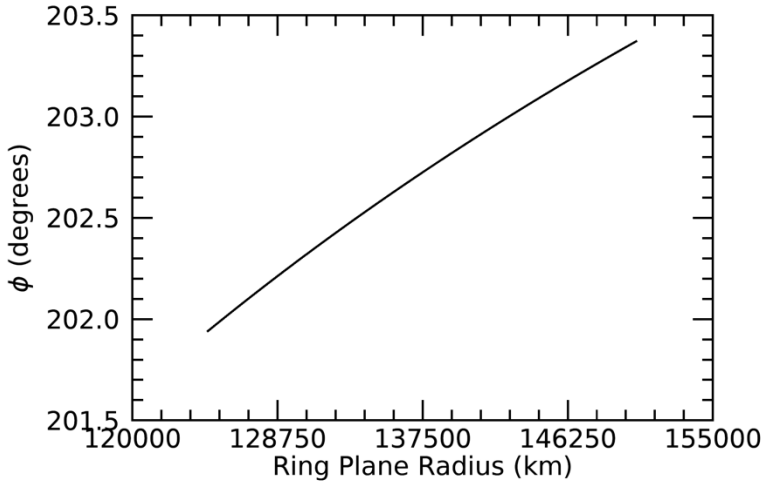
Subsolar lat/lon: −5.90, −6.76

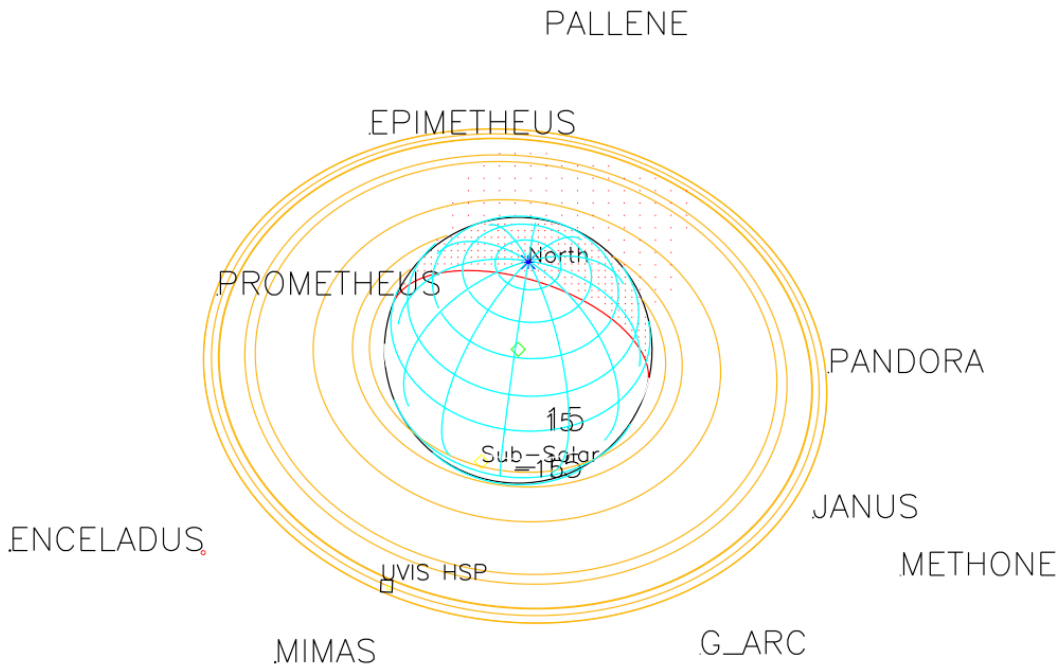
Sub−s/c lat/lon: 47.04, 20.33


DEL CEN Rev 068 Ingress
HSP Counts (per second)
1.4×10^5
1.2×10^5
1.0×10^5
8.0×10^4
6.0×10^4
4.0×10^4
2.0×10^4
80000
100000
120000
140000
Ring Plane Radius (km)


DEL CEN Rev 068 Ingress
Radial Resolution (m)
10.94
10.93
10.92
10.91
10.90
10.89
10.88
120000
128750
137500
146250
155000
Ring Plane Radius (km)


HSP Counts (per second)
1.4×10^5
1.2×10^5
1.0×10^5
8.0×10^4
6.0×10^4
4.0×10^4
2.0×10^4
120000
128750
137500
146250
155000
Ring Plane Radius (km)


ϕ (degrees)
203.5
203.0
202.5
202.0
201.5
120000
128750
137500
146250
155000
Ring Plane Radius (km)

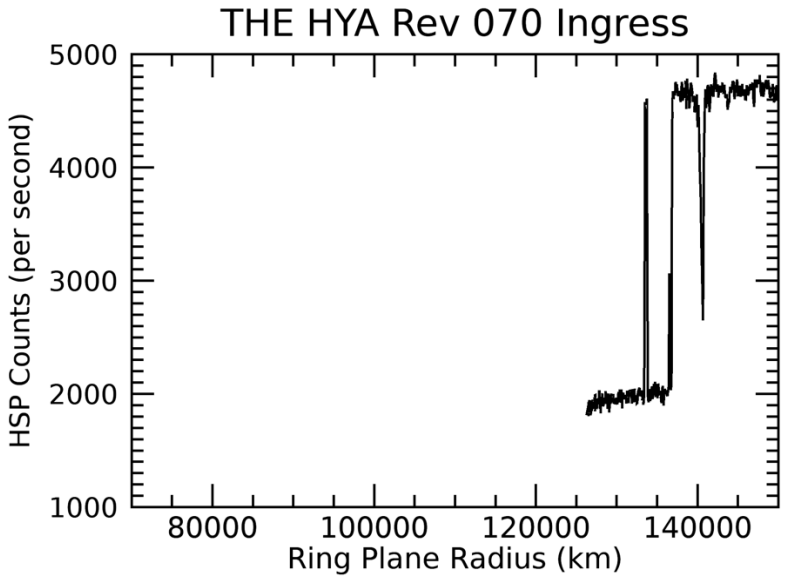


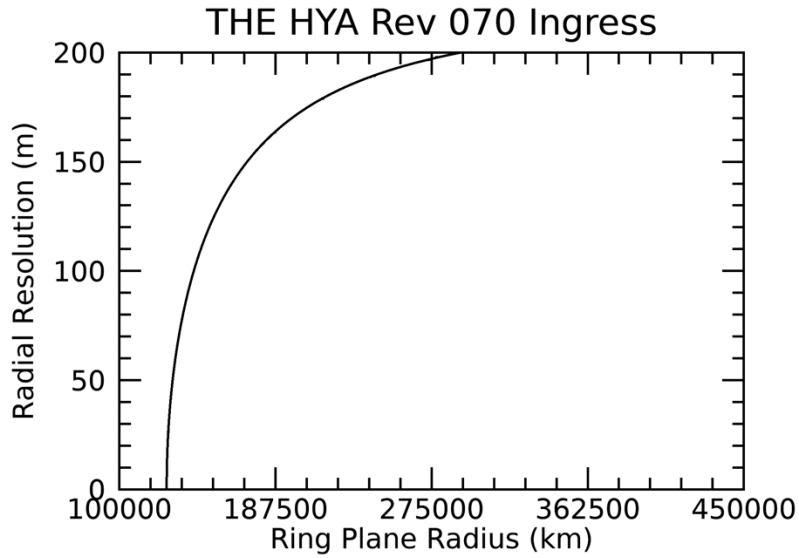
2008-137T18:15:00.000 TETHYS 352211.60 km

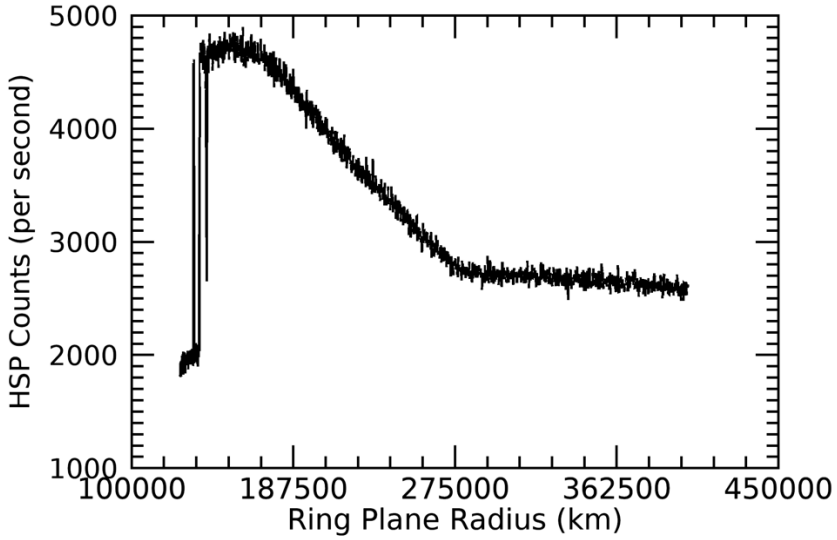
Target RA/dec: 175.94, -43.99

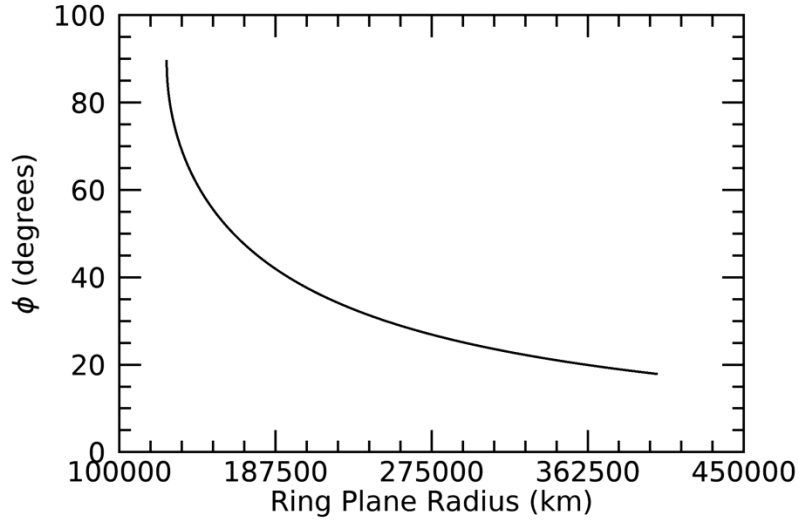
Subsolar lat/lon: -5.67, -127.85

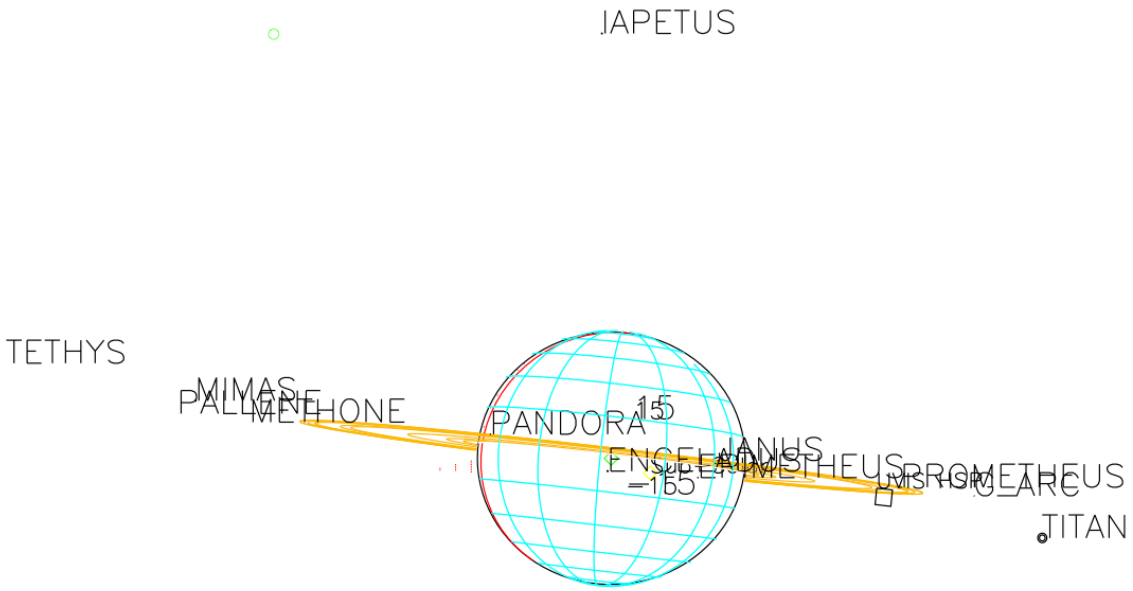
Sub-s/c lat/lon: 42.89, -117.96


THE HYA Rev 070 Ingress
HSP Counts (per second)
5000
4000
3000
2000
1000
80000
100000
120000
140000
Ring Plane Radius (km)


THE HYA Rev 070 Ingress
Radial Resolution (m)
200
150
100
50
0
100000
187500
275000
362500
450000
Ring Plane Radius (km)


HSP Counts (per second)
5000
4000
3000
2000
1000
100000
187500
275000
362500
450000
Ring Plane Radius (km)


ϕ (degrees)
100
80
60
40
20
0
100000
187500
275000
362500
450000
Ring Plane Radius (km)

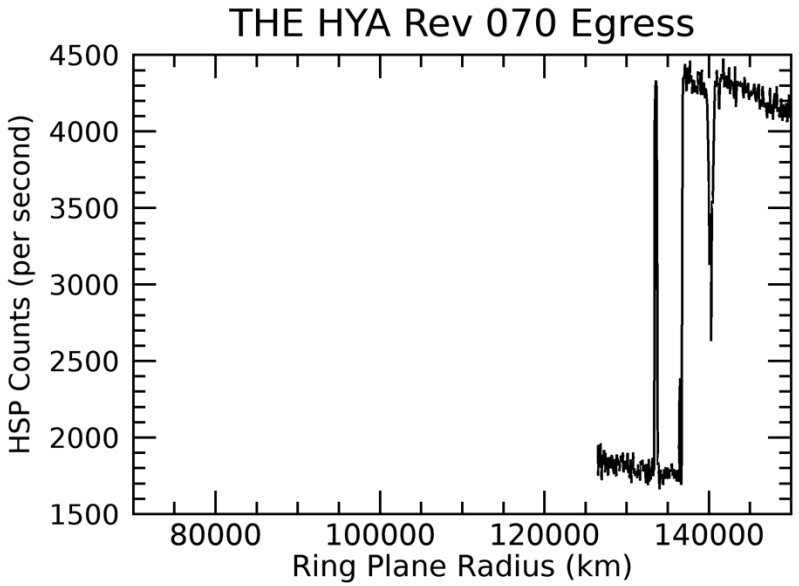


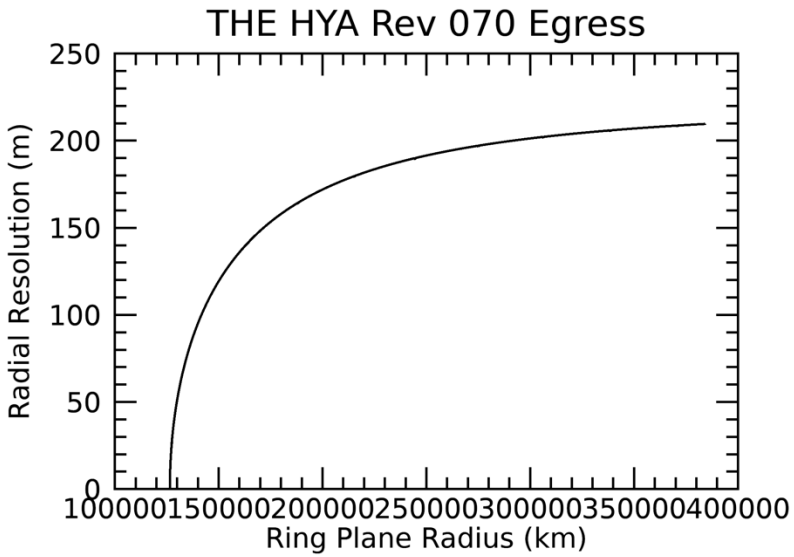
2008-156T08:57:00.000 1174726.7 km

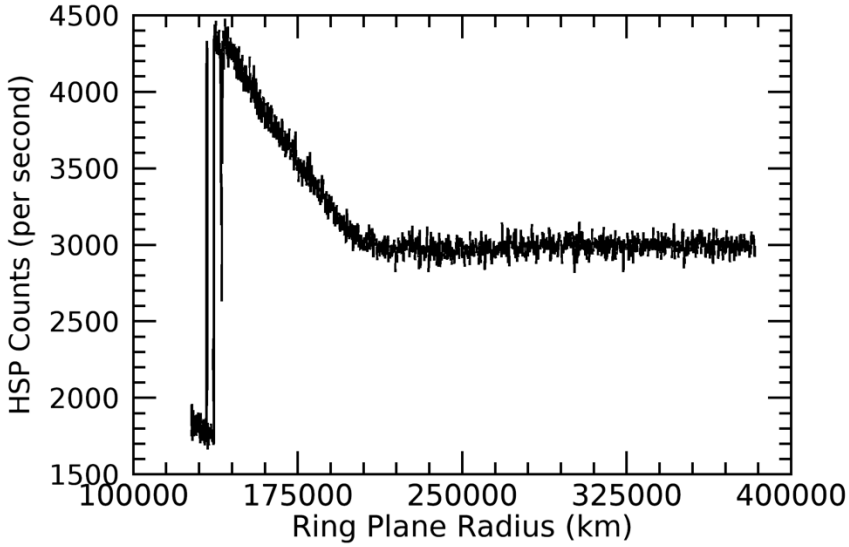
Target RA/dec: 144.64, 3.21

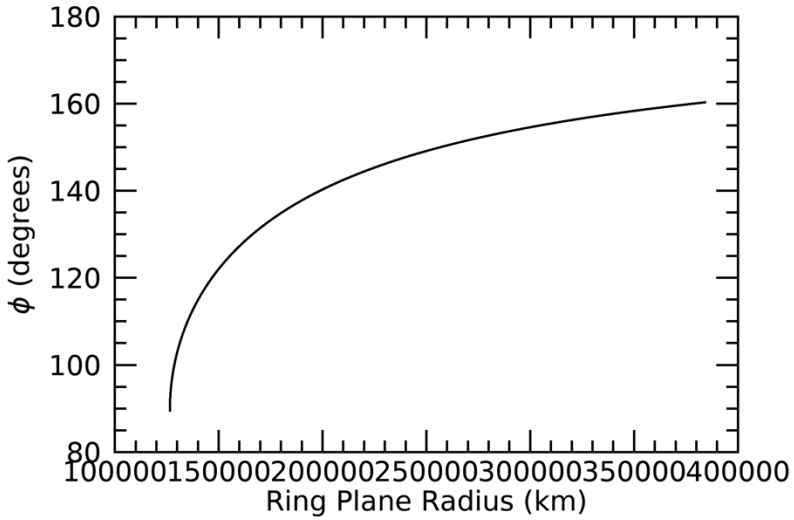
Subsolar lat/lon: -5.44, -98.15

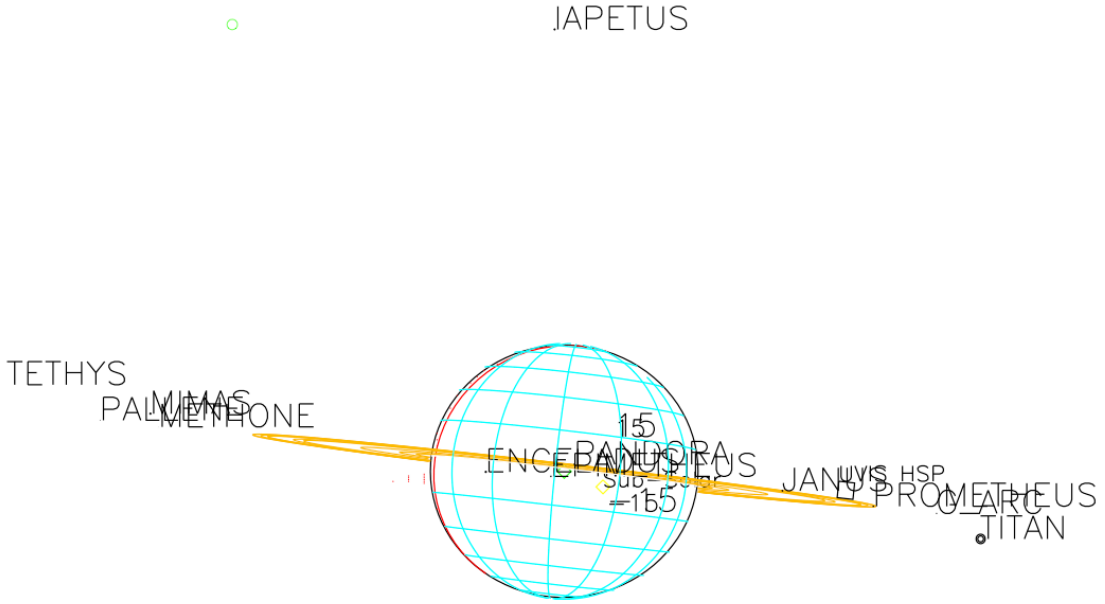
Sub-s/c lat/lon: -1.34, -114.95


THE HYA Rev 070 Egress
HSP Counts (per second)
Ring Plane Radius (km)
4500
4000
3500
3000
2500
2000
1500
80000
100000
120000
140000


THE HYA Rev 070 Egress
Radial Resolution (m)
Ring Plane Radius (km)
250
200
150
100
50
0
100000
150000
200000
250000
300000
350000
400000


HSP Counts (per second)
Ring Plane Radius (km)
4500
4000
3500
3000
2500
2000
1500
100000
175000
250000
325000
400000


ϕ (degrees)
Ring Plane Radius (km)
180
160
140
120
100
80
100000
150000
200000
250000
300000
350000
400000

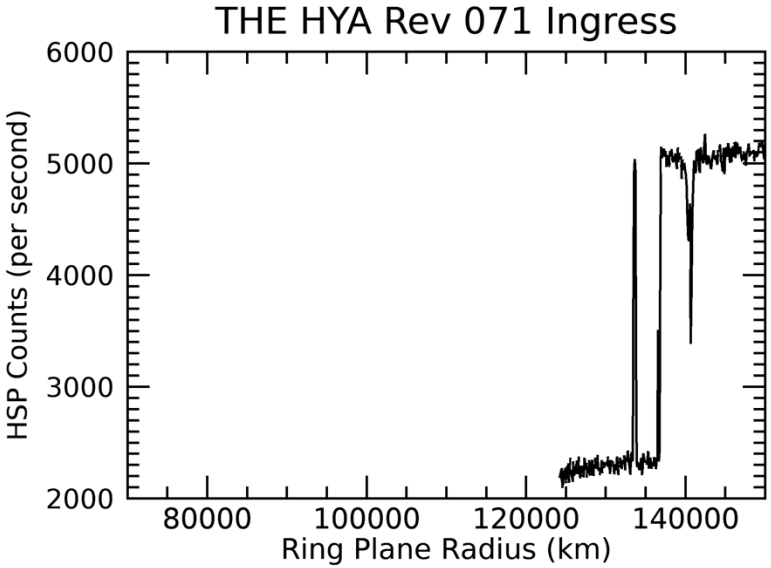


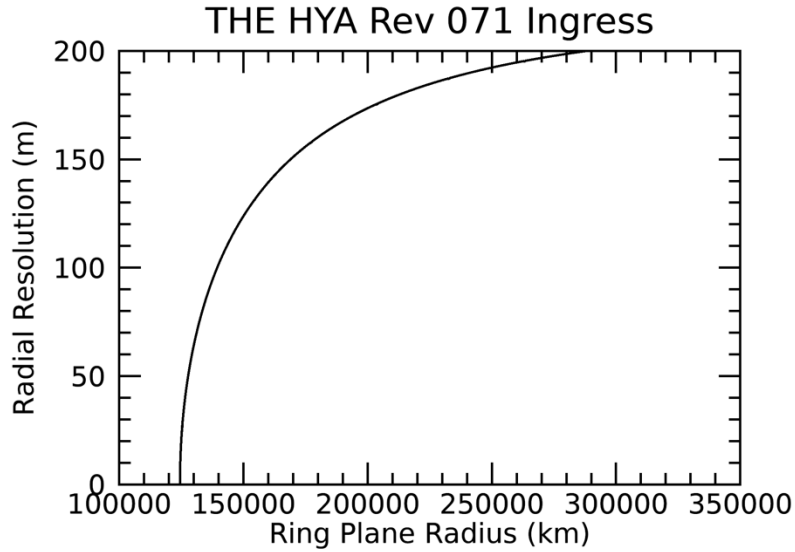
2008-156T09:52:00.000 1180844.4 km

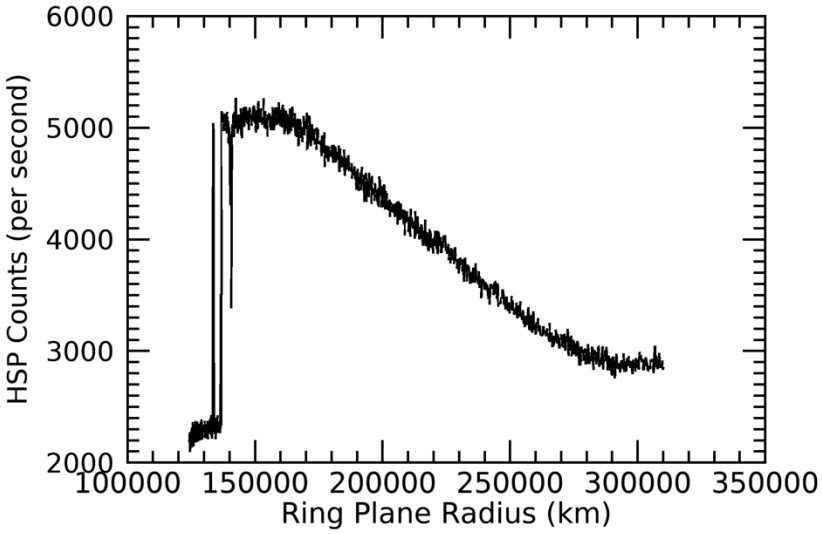
Target RA/dec: 144.80, 2.79

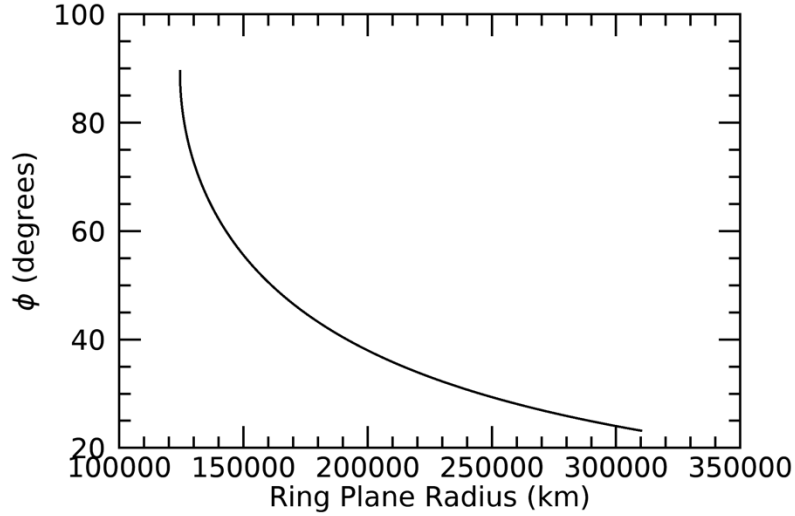
Subsolar lat/lon: -5.44, -129.12

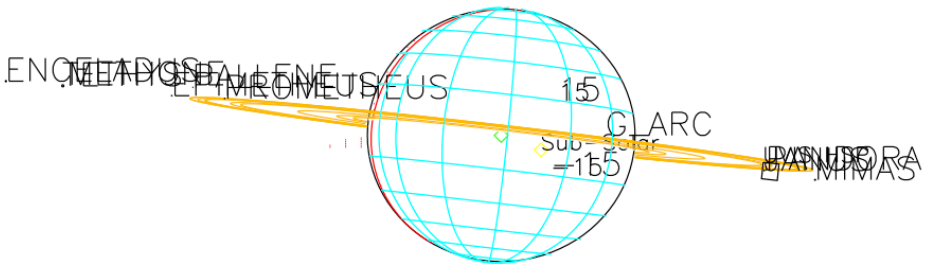
Sub-s/c lat/lon: -0.98, -145.80


THE HYA Rev 071 Ingress
HSP Counts (per second)
Ring Plane Radius (km)
6000
5000
4000
3000
2000
80000
100000
120000
140000


THE HYA Rev 071 Ingress
Radial Resolution (m)
Ring Plane Radius (km)
200
150
100
50
0
100000
150000
200000
250000
300000
350000


HSP Counts (per second)
Ring Plane Radius (km)
6000
5000
4000
3000
2000
100000
150000
200000
250000
300000
350000


ϕ (degrees)
Ring Plane Radius (km)
100
80
60
40
20
100000
150000
200000
250000
300000
350000

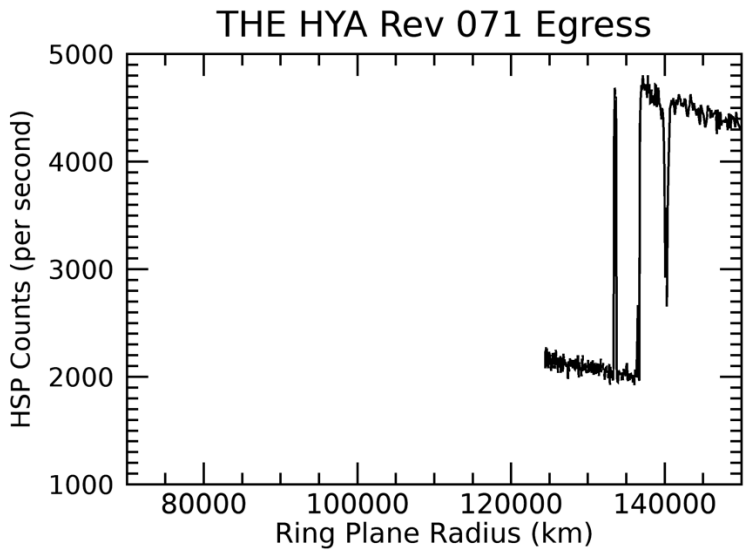


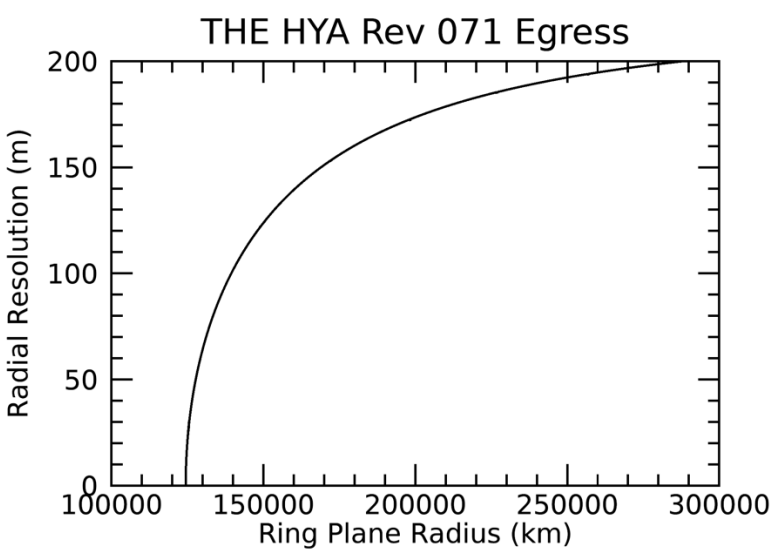
2008-163T12:34:00.000 1176803.0 km

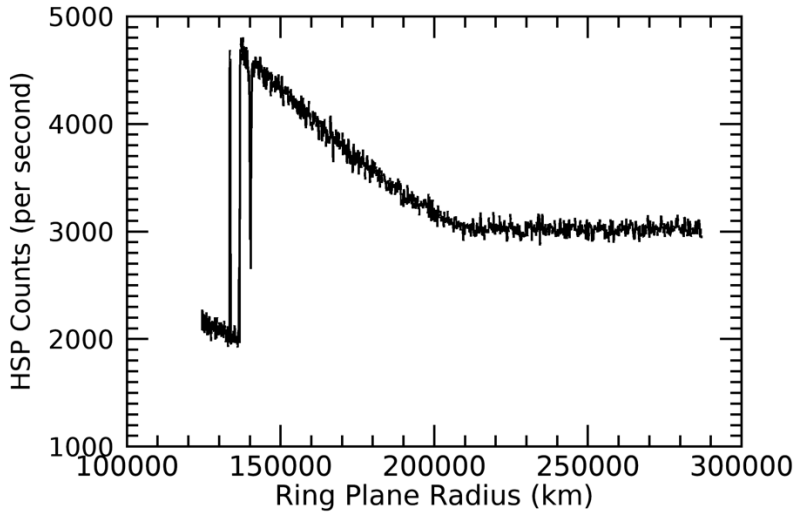
Target RA/dec: 144.55, 3.15

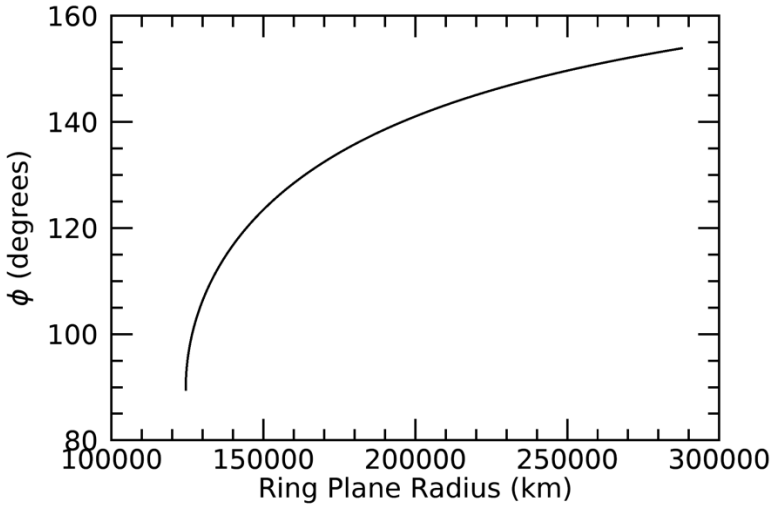
Subsolar lat/lon: -5.35, -135.67

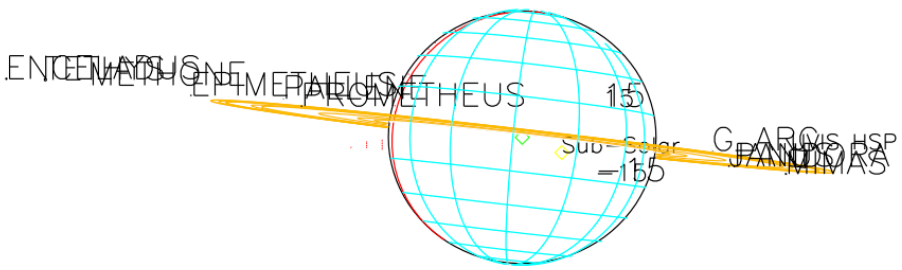
Sub-s/c lat/lon: -1.29, -152.79


THE HYA Rev 071 Egress
HSP Counts (per second)
Ring Plane Radius (km)
5000
4000
3000
2000
1000
80000
100000
120000
140000


THE HYA Rev 071 Egress
Radial Resolution (m)
Ring Plane Radius (km)
200
150
100
50
0
100000
150000
200000
250000
300000


HSP Counts (per second)
Ring Plane Radius (km)
5000
4000
3000
2000
1000
100000
150000
200000
250000
300000


ϕ (degrees)
Ring Plane Radius (km)
160
140
120
100
80
100000
150000
200000
250000
300000

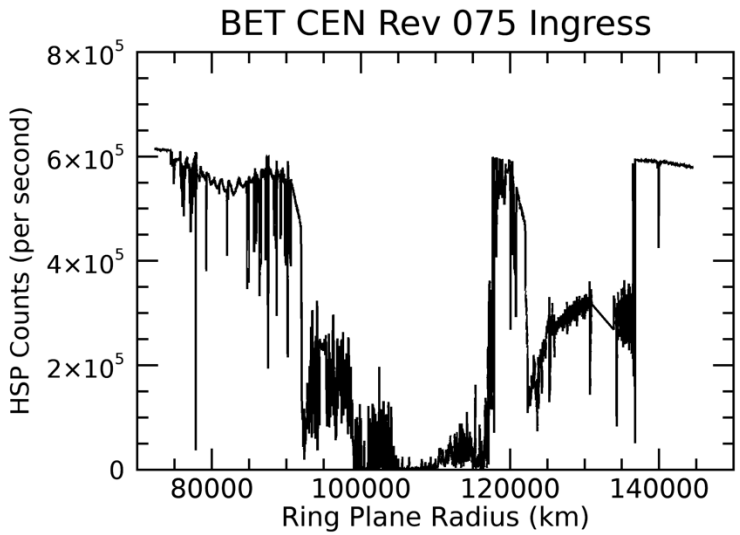


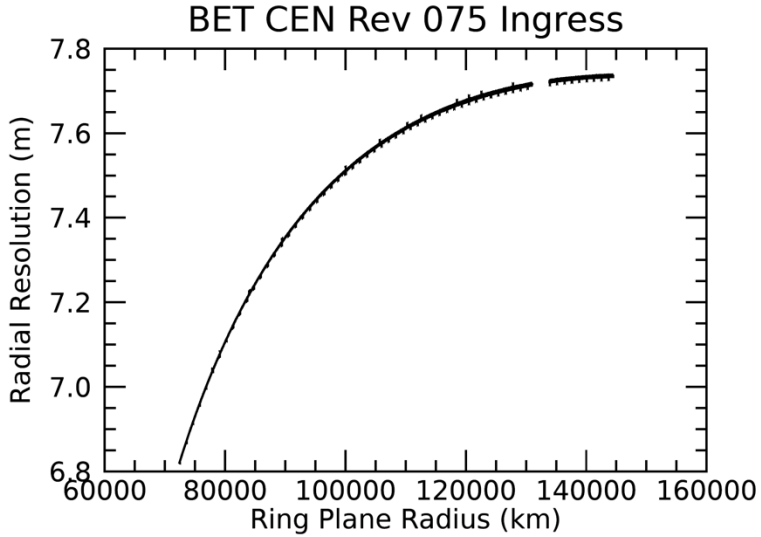
2008-163T13:15:00.000 1181321.6 km

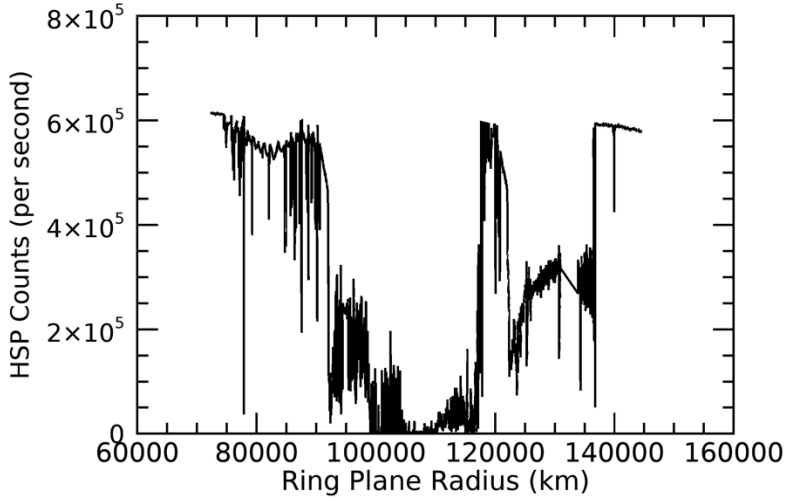
Target RA/dec: 144.67, 2.84

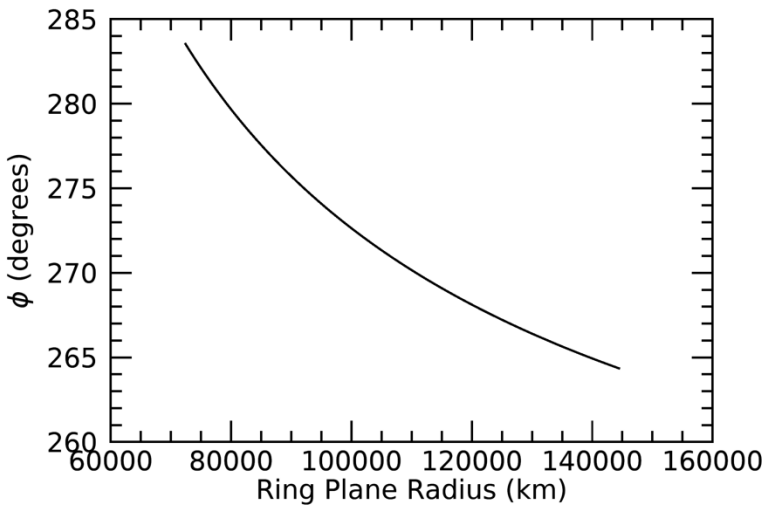
Subsolar lat/lon: -5.35, -158.75

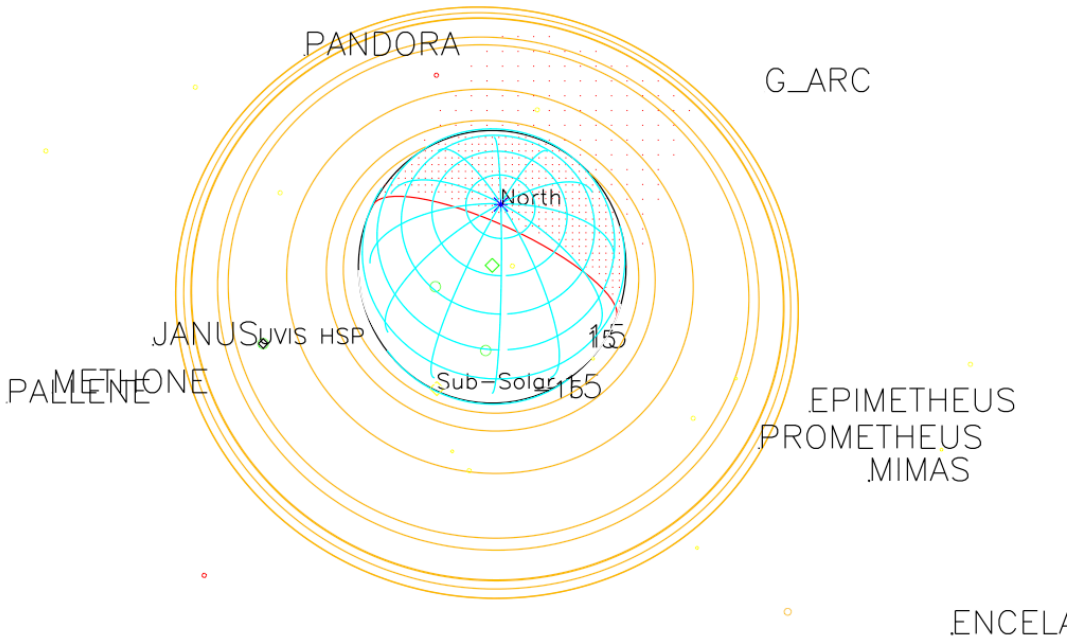
Sub-s/c lat/lon: -1.03, -175.78


BET CEN Rev 075 Ingress
HSP Counts (per second)
8×10^5
6×10^5
4×10^5
2×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 075 Ingress
Radial Resolution (m)
7.8
7.6
7.4
7.2
7.0
6.8
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
8×10^5
6×10^5
4×10^5
2×10^5
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
285
280
275
270
265
260
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

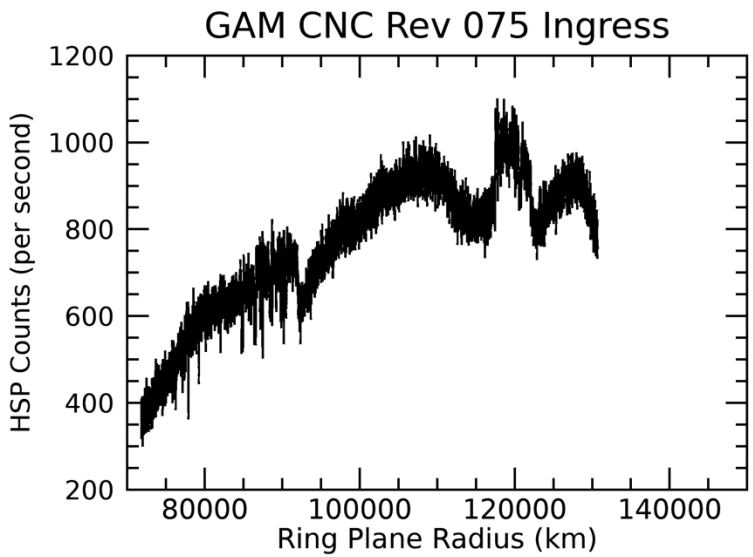


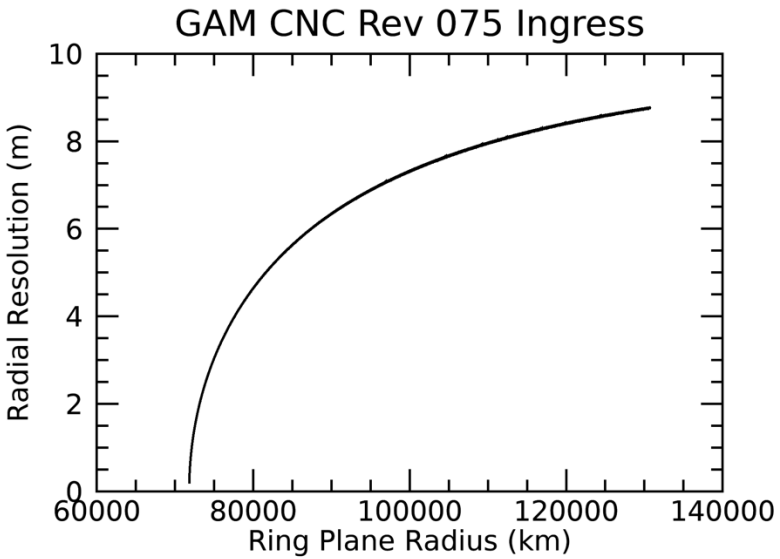
2008-188T22:02:00.000 483291.30 km

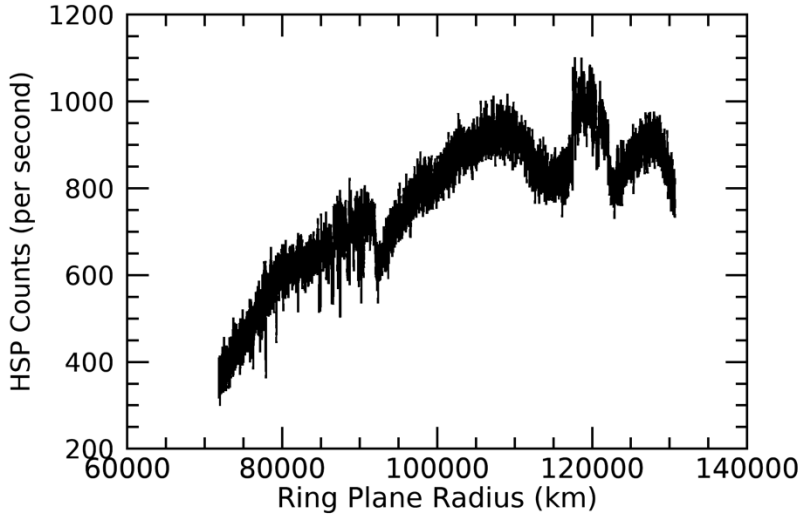
Target RA/dec: 185.87, -58.73

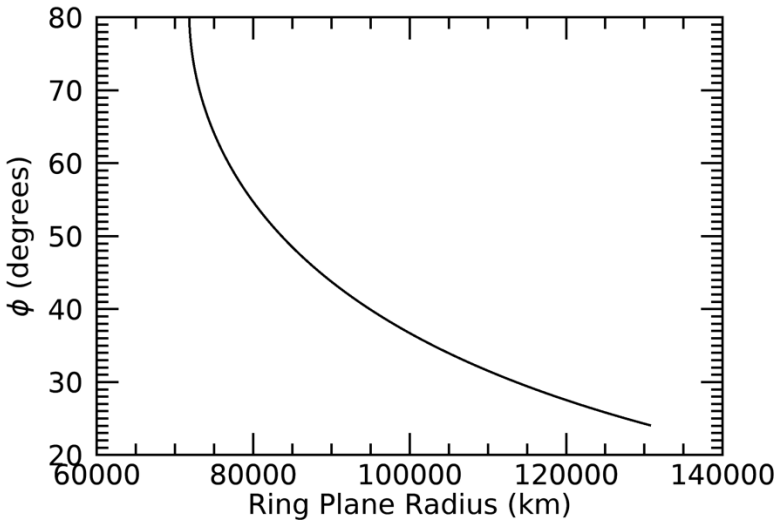
Subsolar lat/lon: -5.03, 155.46

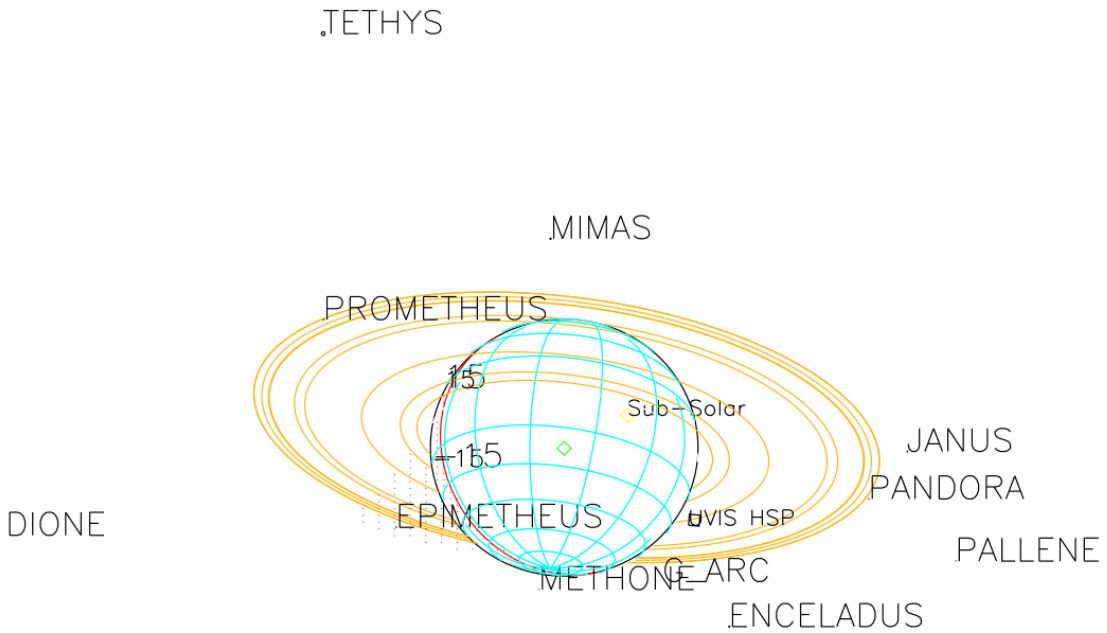
Sub-s/c lat/lon: 59.48, 171.27


GAM CNC Rev 075 Ingress
HSP Counts (per second)
1200
1000
800
600
400
200
80000
100000
120000
140000
Ring Plane Radius (km)


GAM CNC Rev 075 Ingress
Radial Resolution (m)
10
8
6
4
2
0
60000
80000
100000
120000
140000
Ring Plane Radius (km)


HSP Counts (per second)
1200
1000
800
600
400
200
60000
80000
100000
120000
140000
Ring Plane Radius (km)


ϕ (degrees)
80
70
60
50
40
30
20
60000
80000
100000
120000
140000
Ring Plane Radius (km)

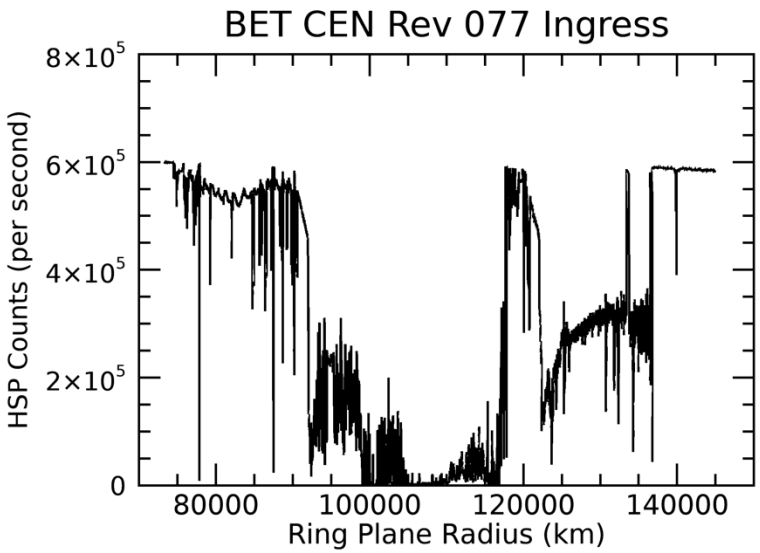


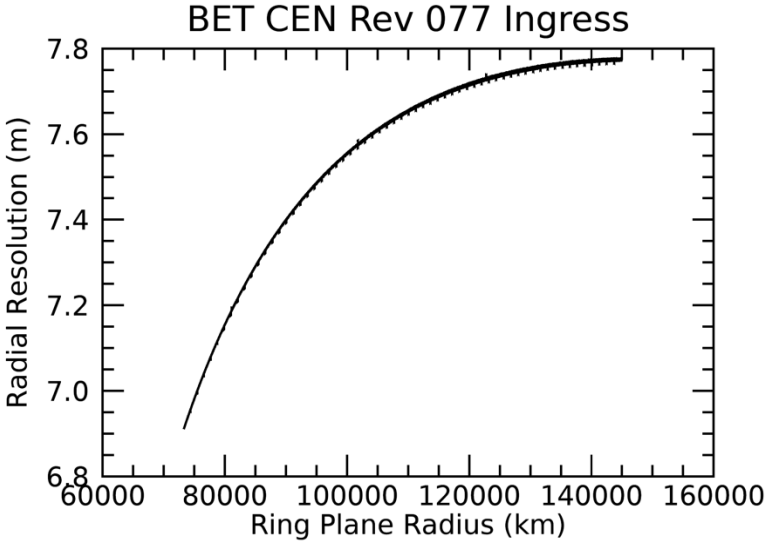
2008-190T12:03:00.000 795729.20 km

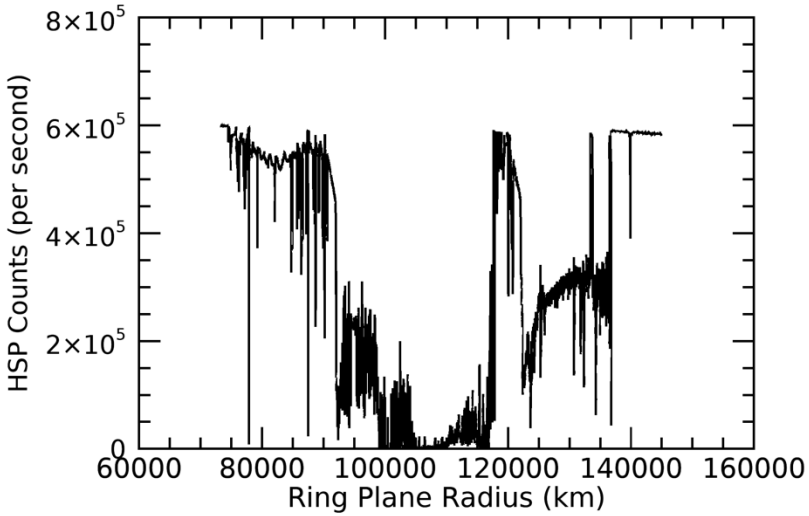
Target RA/dec: 135.42, 23.70

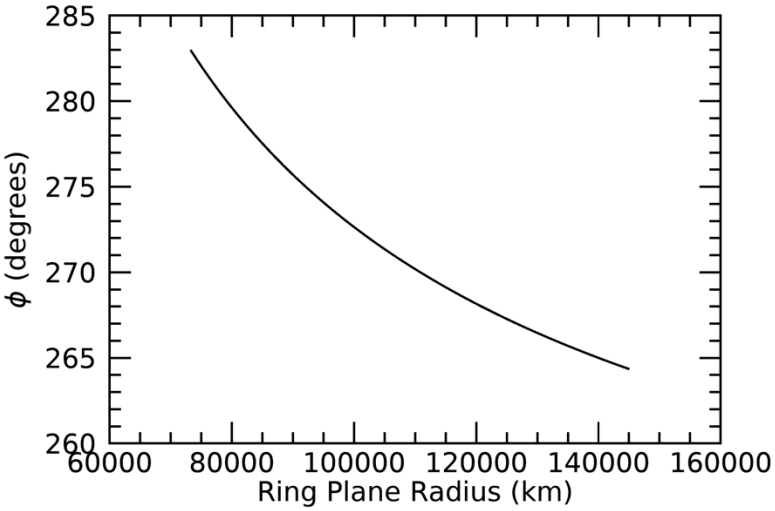
Subsolar lat/lon: -5.01, -48.80

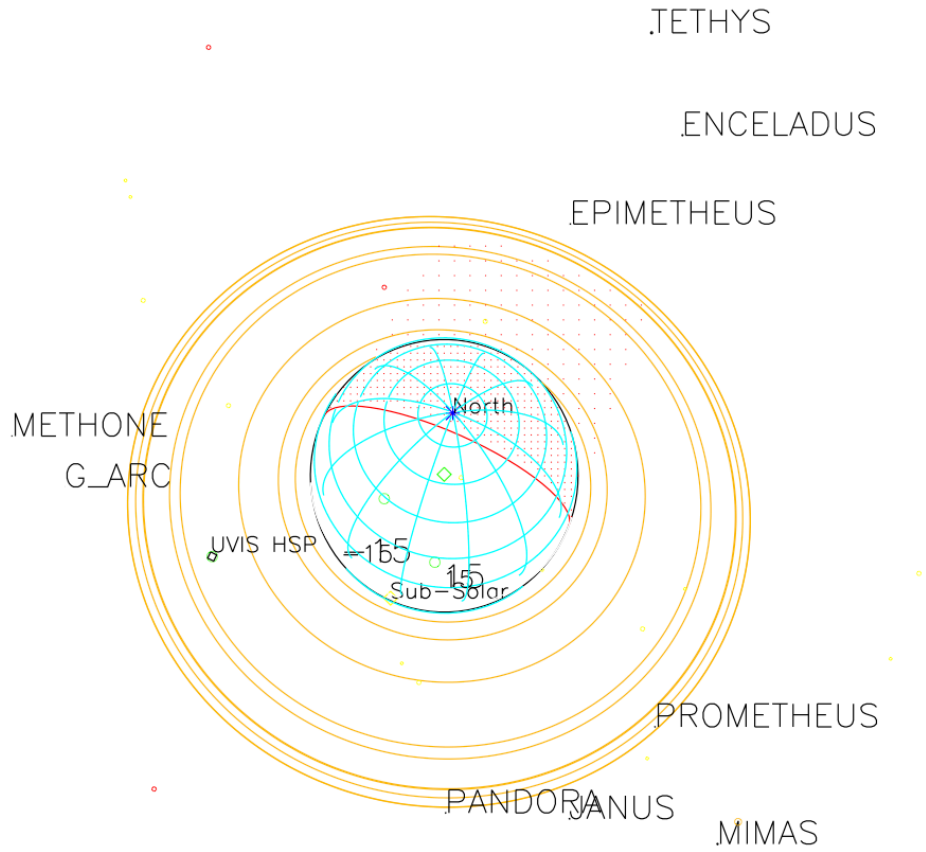
Sub-s/c lat/lon: -19.30, -73.39


BET CEN Rev 077 Ingress
HSP Counts (per second)
8×10^5
6×10^5
4×10^5
2×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)

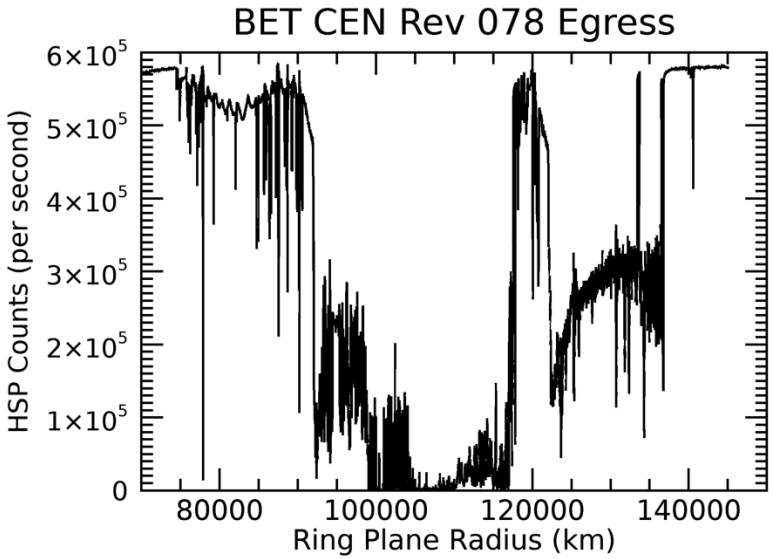

BET CEN Rev 077 Ingress
Radial Resolution (m)
7.8
7.6
7.4
7.2
7.0
6.8
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

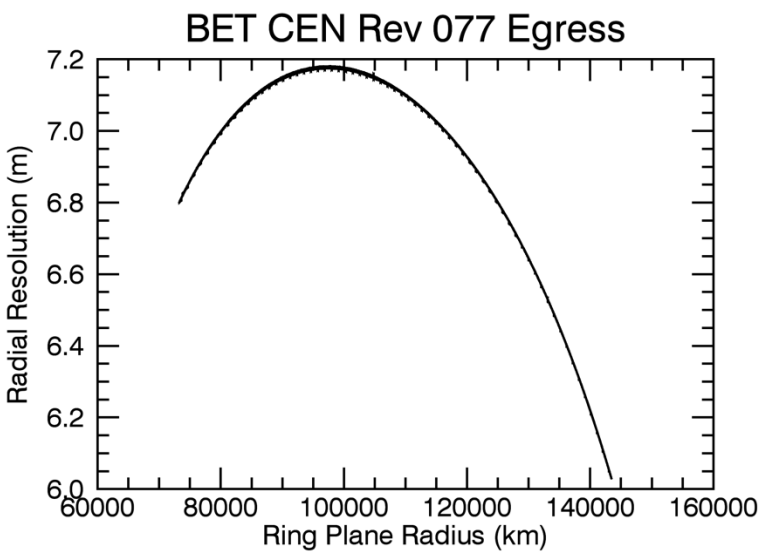

HSP Counts (per second)
8×10^5
6×10^5
4×10^5
2×10^5
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

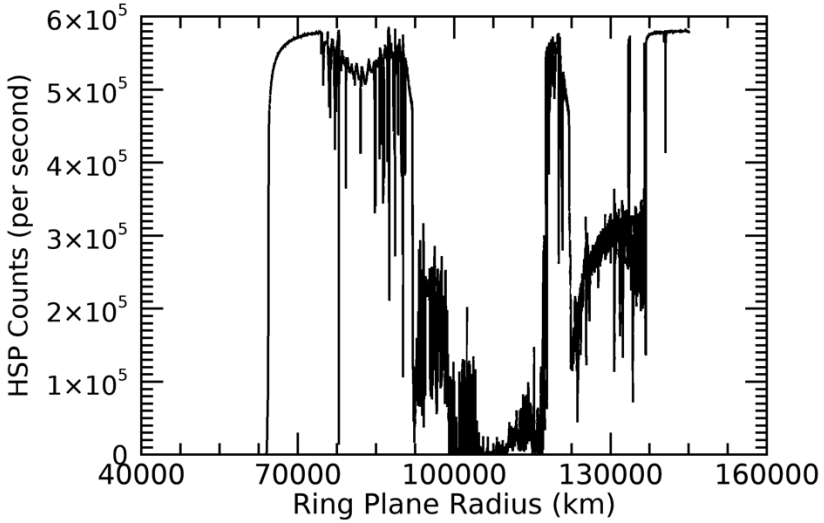

ϕ (degrees)
285
280
275
270
265
260
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

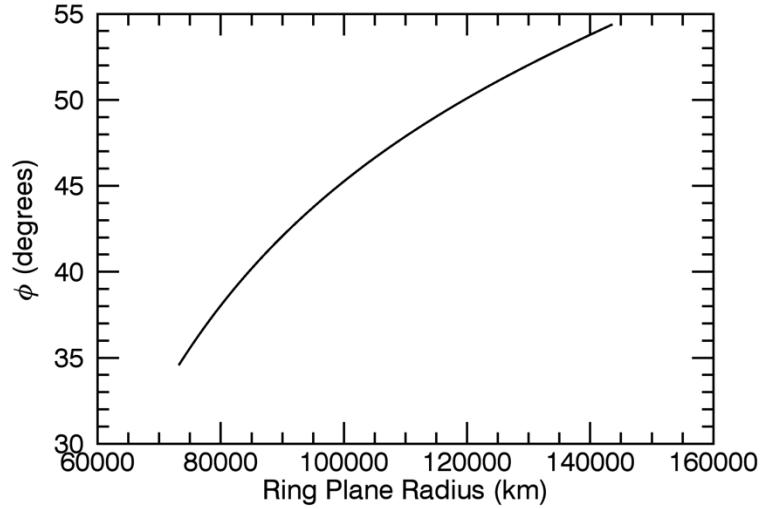


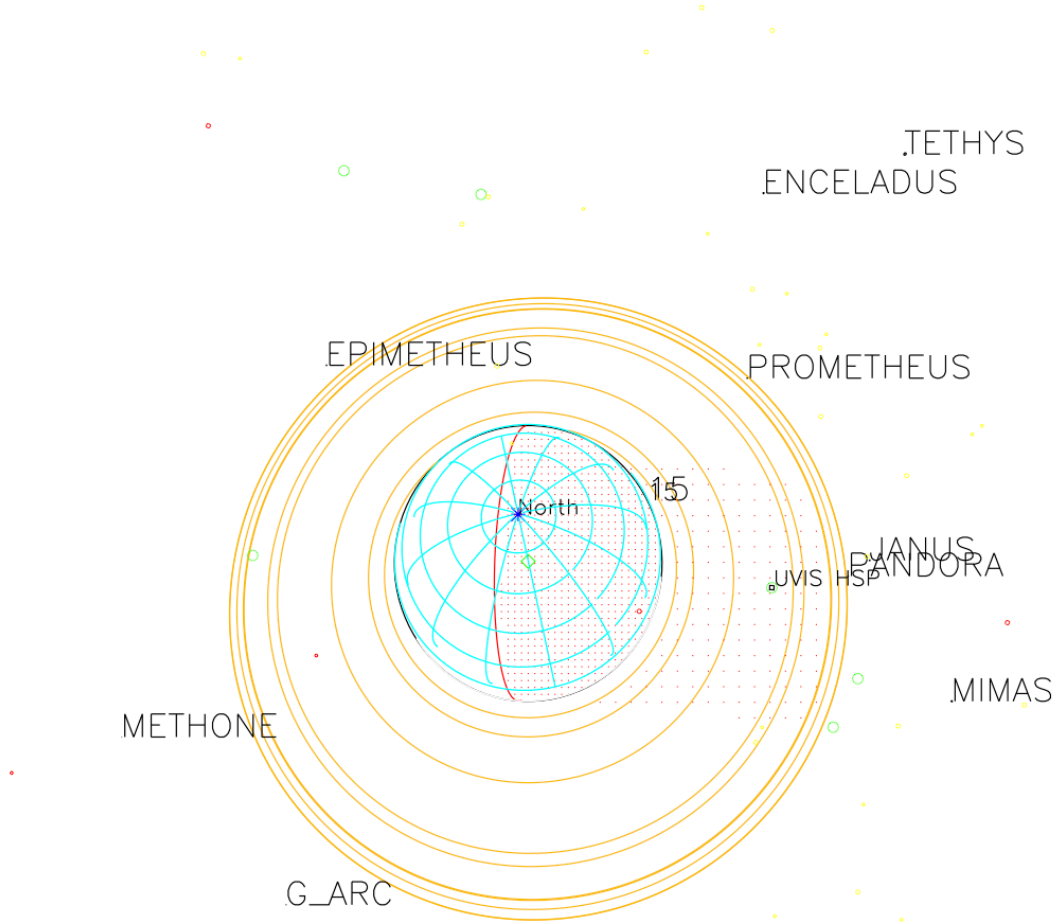
2008-202T23:44:00.000 483189.94 km
Target RA/dec: 185.54, -58.59
Subsolar lat/lon: -4.85, -92.65
Sub-s/c lat/lon: 59.30, -77.62


BET CEN Rev 078 Egress
HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 077 Egress
Radial Resolution (m)
7.2
7.0
6.8
6.6
6.4
6.2
6.0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
40000
70000
100000
130000
160000
Ring Plane Radius (km)


ϕ (degrees)
55
50
45
40
35
30
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

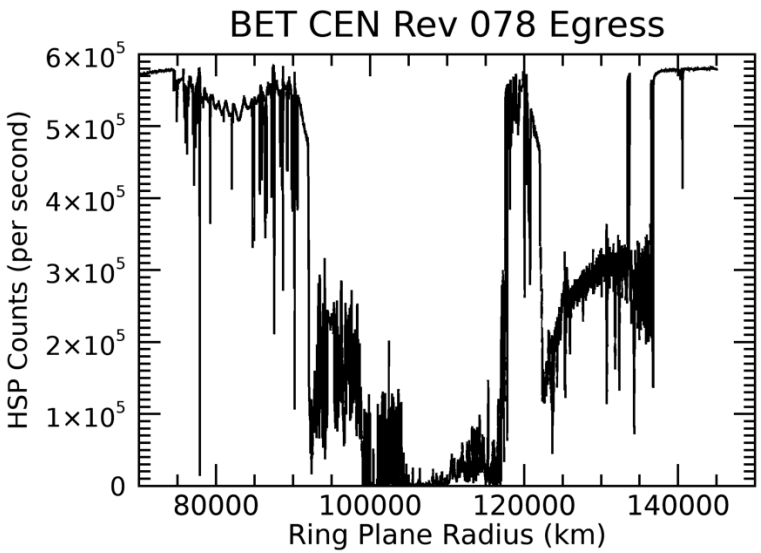


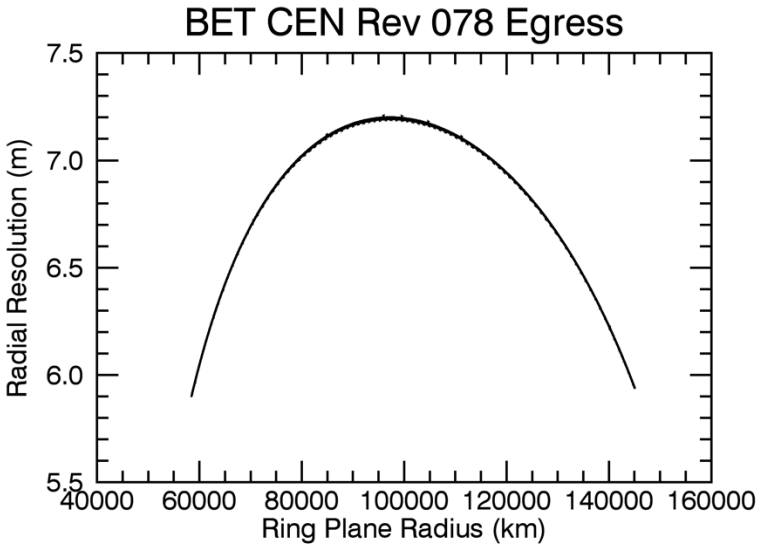
2008-203T06:23:00.000 284519.25 km

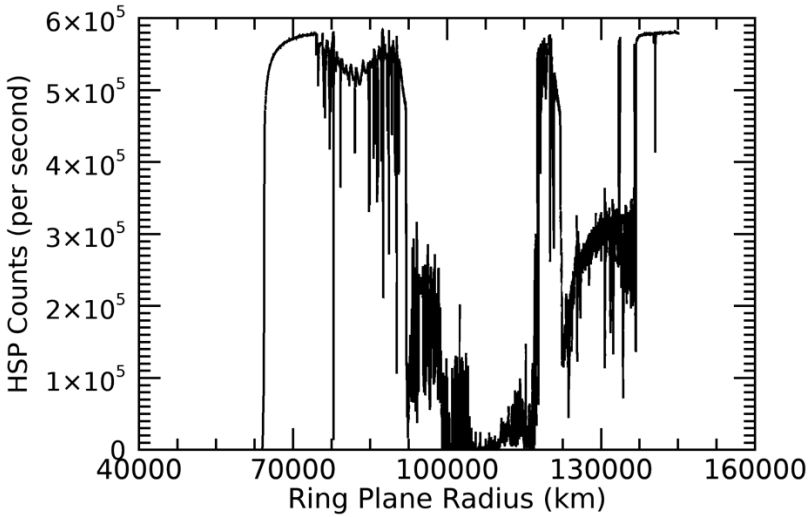
Target RA/dec: 258.65, -66.73

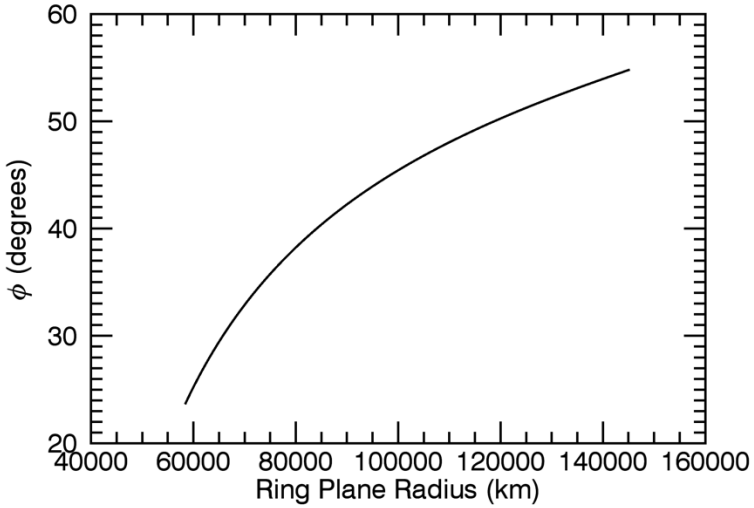
Subsolar lat/lon: -4.85, 42.70

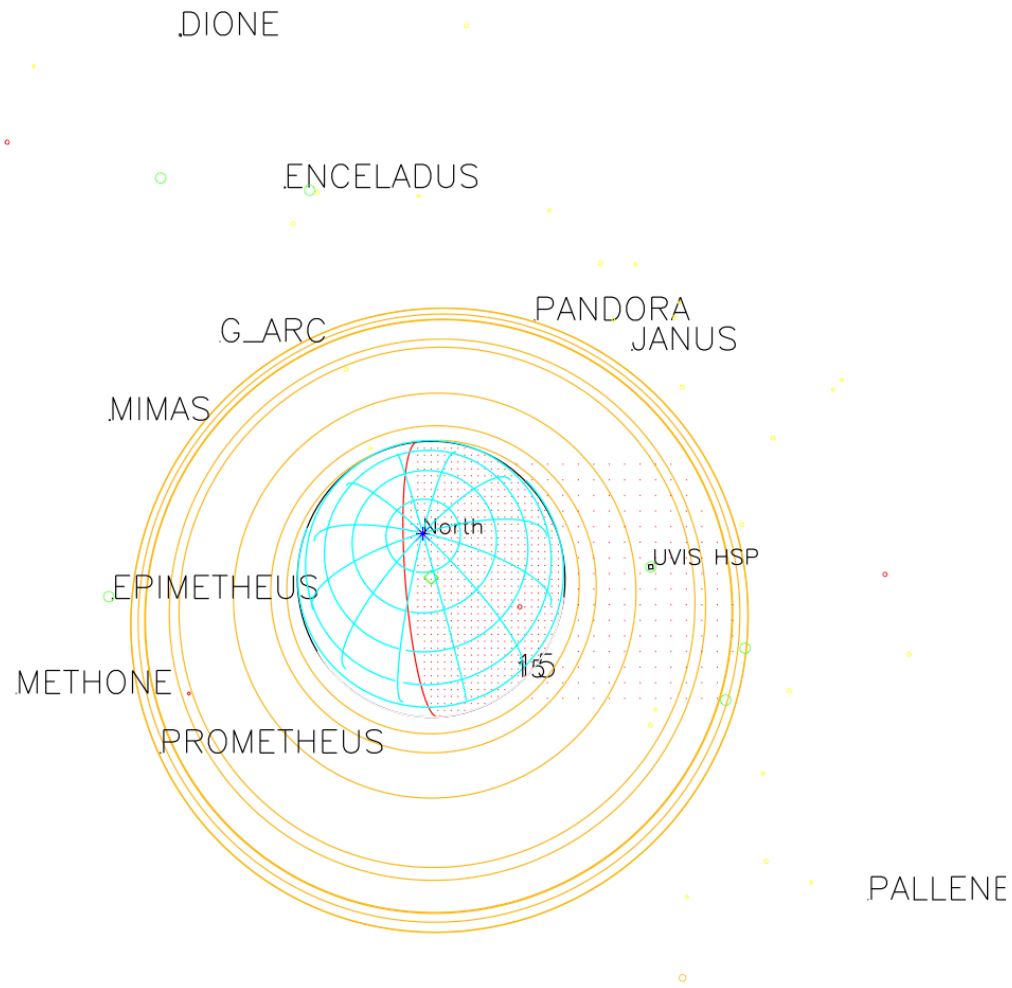
Sub-s/c lat/lon: 68.39, 149.92


BET CEN Rev 078 Egress
HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 078 Egress
Radial Resolution (m)
7.5
7.0
6.5
6.0
5.5
40000
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
40000
70000
100000
130000
160000
Ring Plane Radius (km)


ϕ (degrees)
60
50
40
30
20
40000
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

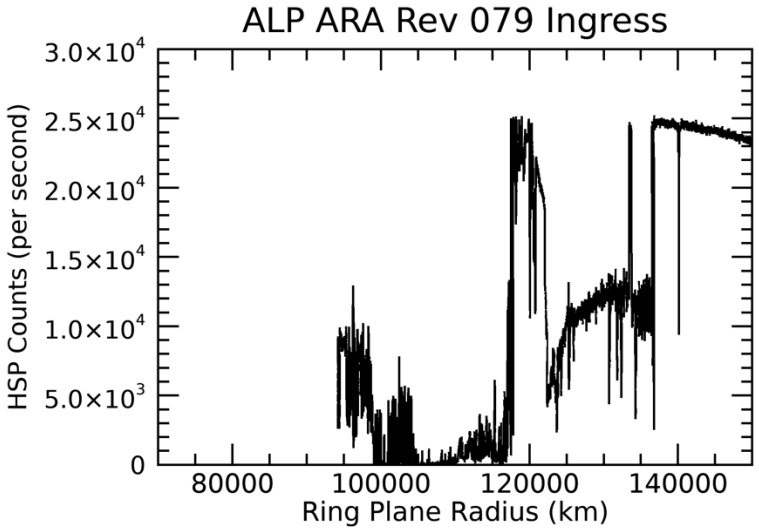


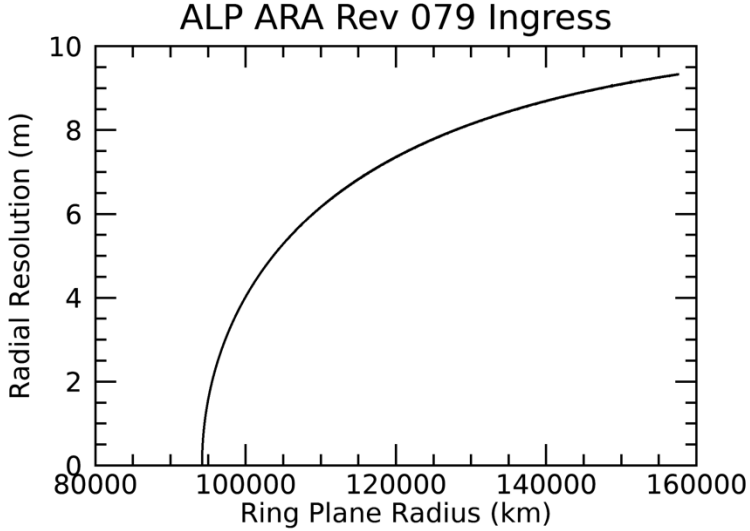
2008-210T07:01:00.000 295082.59 km

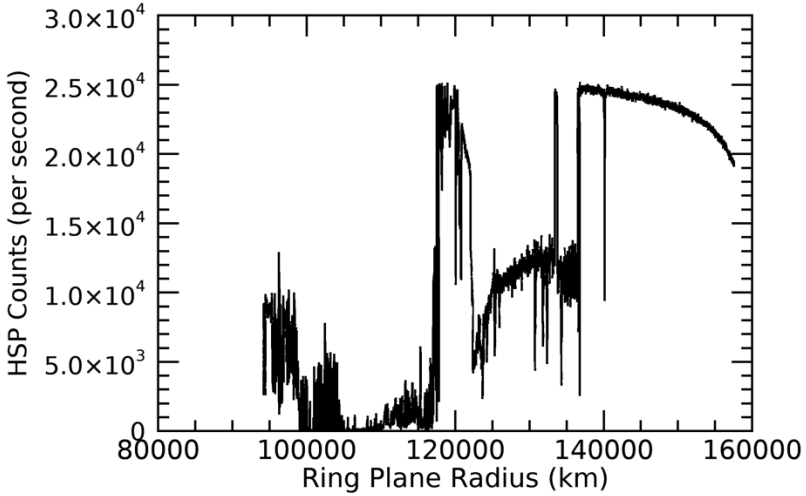
Target RA/dec: 251.72, -67.59

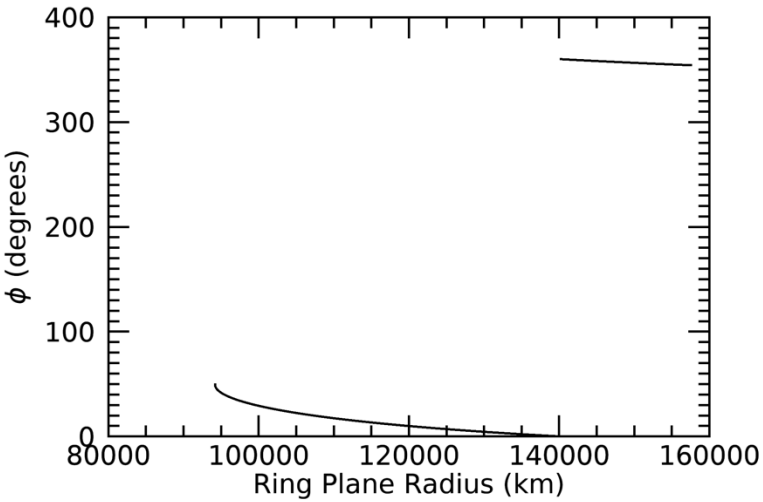
Subsolar lat/lon: -4.76, 105.97

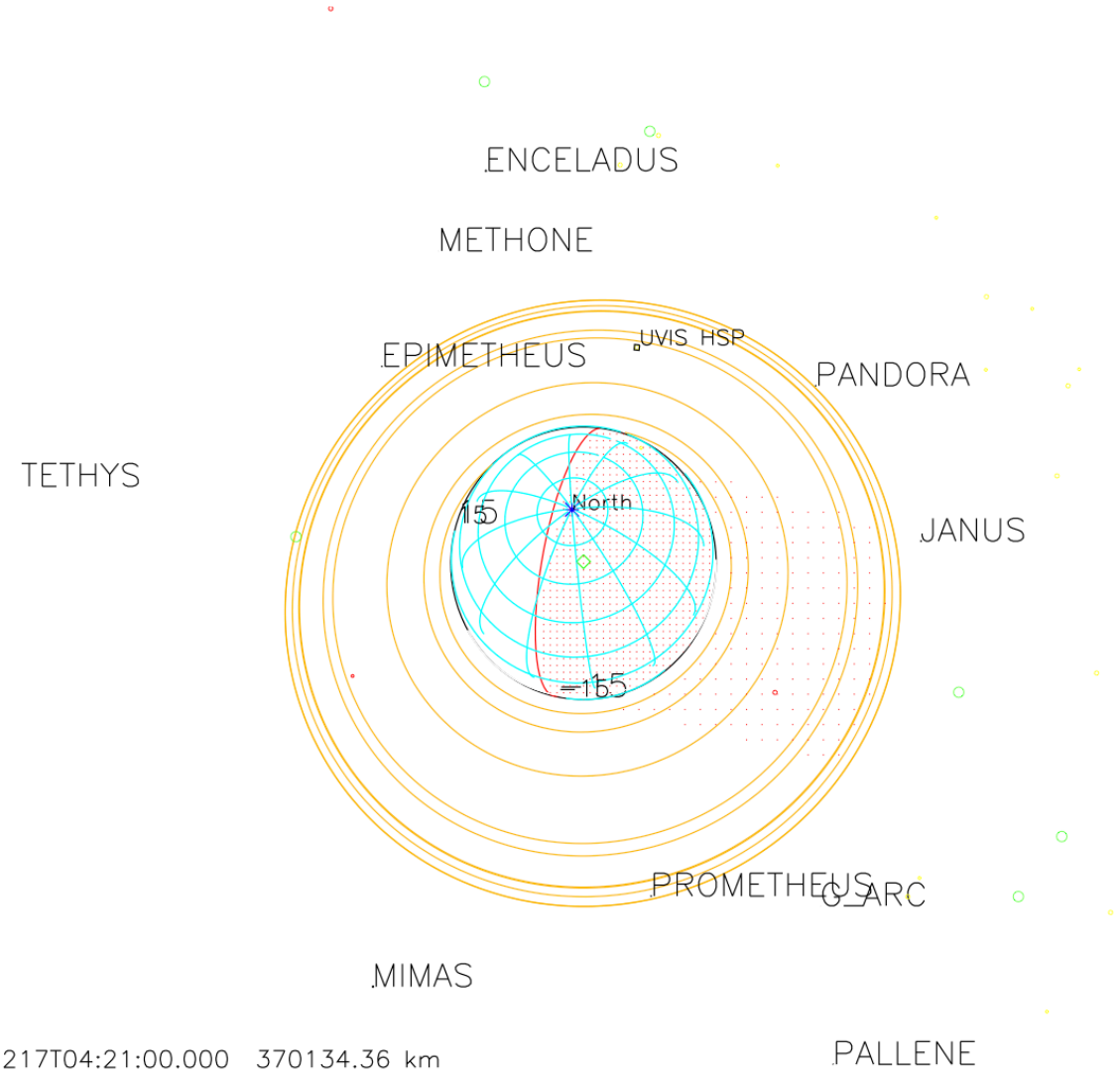
Sub-s/c lat/lon: 69.96, -155.01


ALP ARA Rev 079 Ingress
HSP Counts (per second)
3.0×10^4
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 079 Ingress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
3.0×10^4
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
400
300
200
100
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)

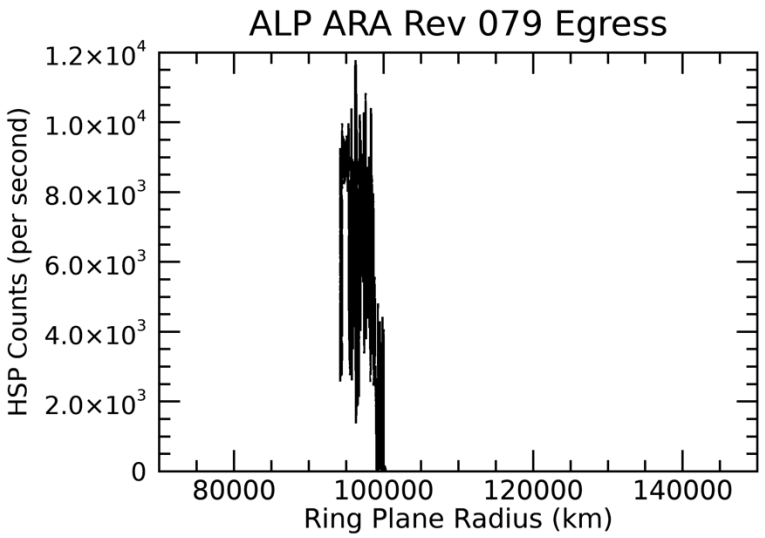


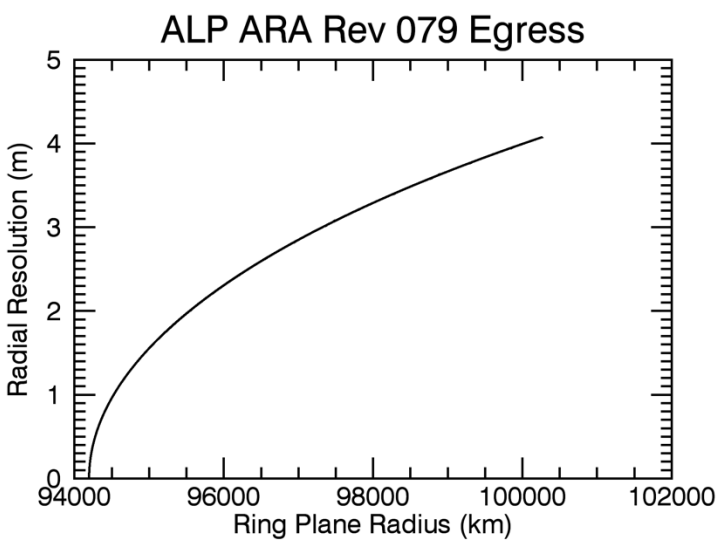
2008-217T04:21:00.000 370134.36 km

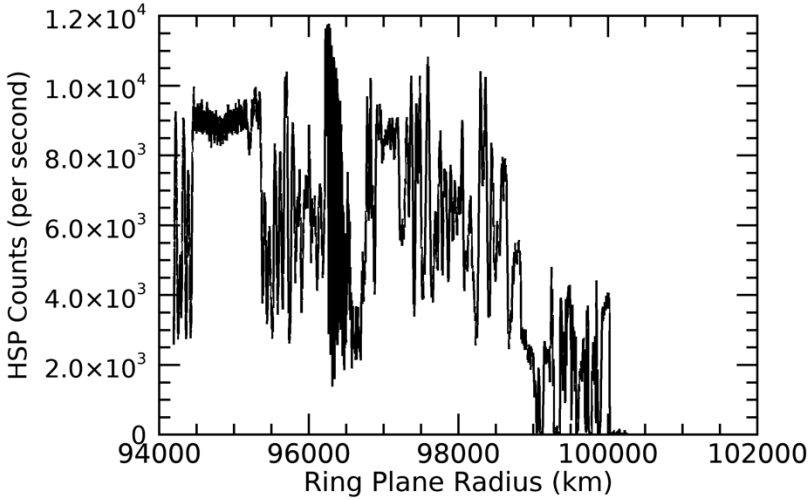
Target RA/dec: 268.65, -64.28

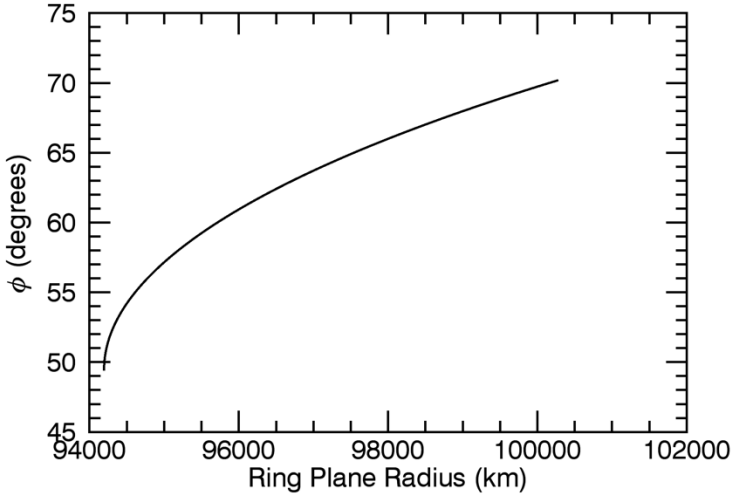
Subsolar lat/lon: -4.68, -79.28

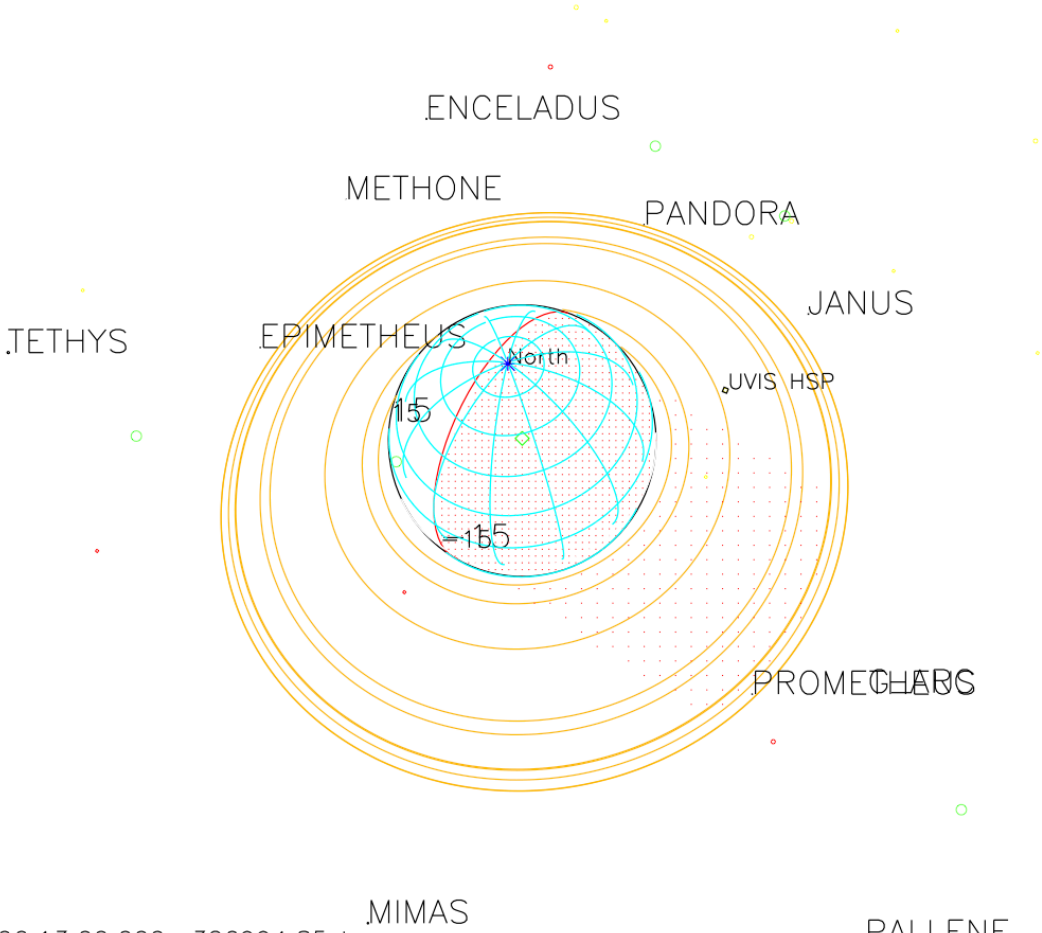
Sub-s/c lat/lon: 64.45, 37.63


ALP ARA Rev 079 Egress
HSP Counts (per second)
1.2×10^4
1.0×10^4
8.0×10^3
6.0×10^3
4.0×10^3
2.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 079 Egress
Radial Resolution (m)
5
4
3
2
1
0
94000
96000
98000
100000
102000
Ring Plane Radius (km)


HSP Counts (per second)
1.2×10^4
1.0×10^4
8.0×10^3
6.0×10^3
4.0×10^3
2.0×10^3
0
94000
96000
98000
100000
102000
Ring Plane Radius (km)


ϕ (degrees)
75
70
65
60
55
50
45
94000
96000
98000
100000
102000
Ring Plane Radius (km)

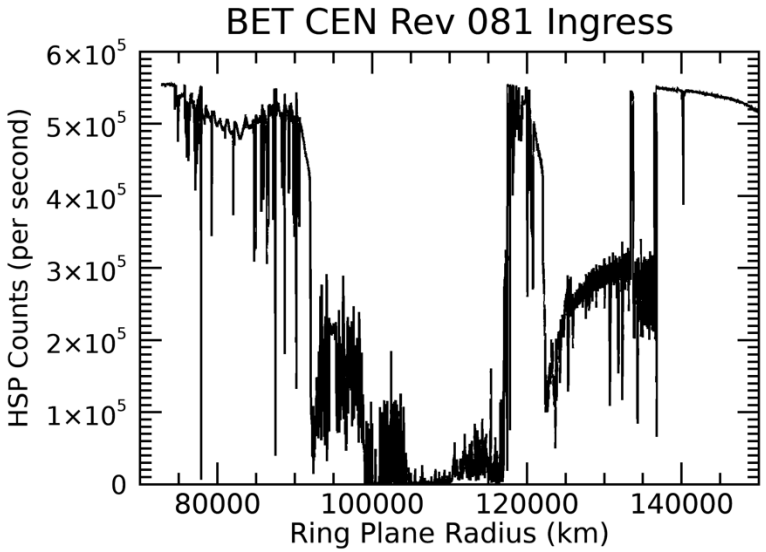


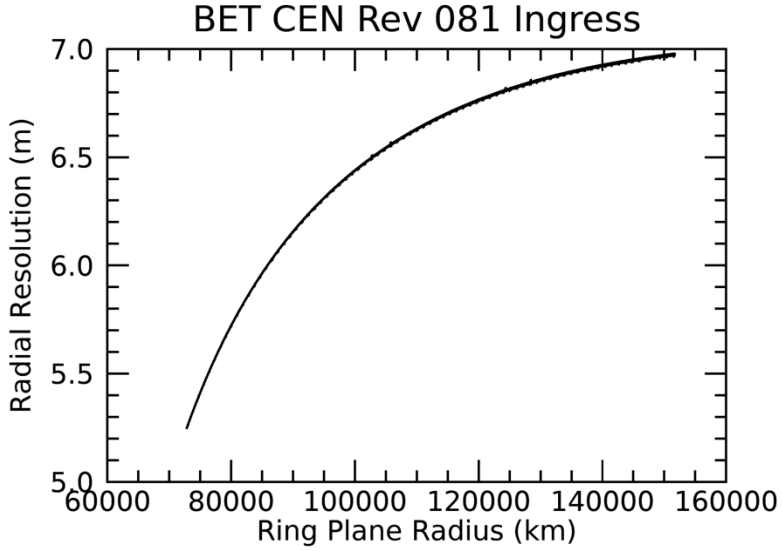
2008-217T06:13:00.000 326994.85 km

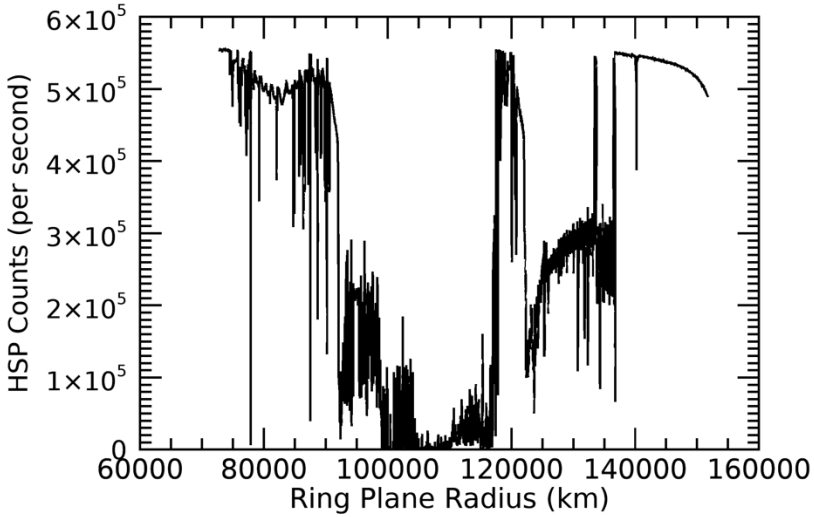
Target RA/dec: 287.99, -56.32

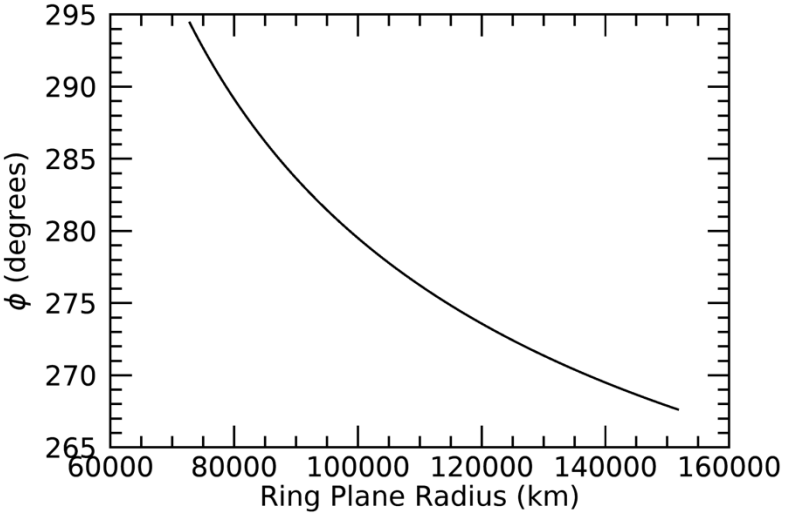
Subsolar lat/lon: -4.67, -142.34

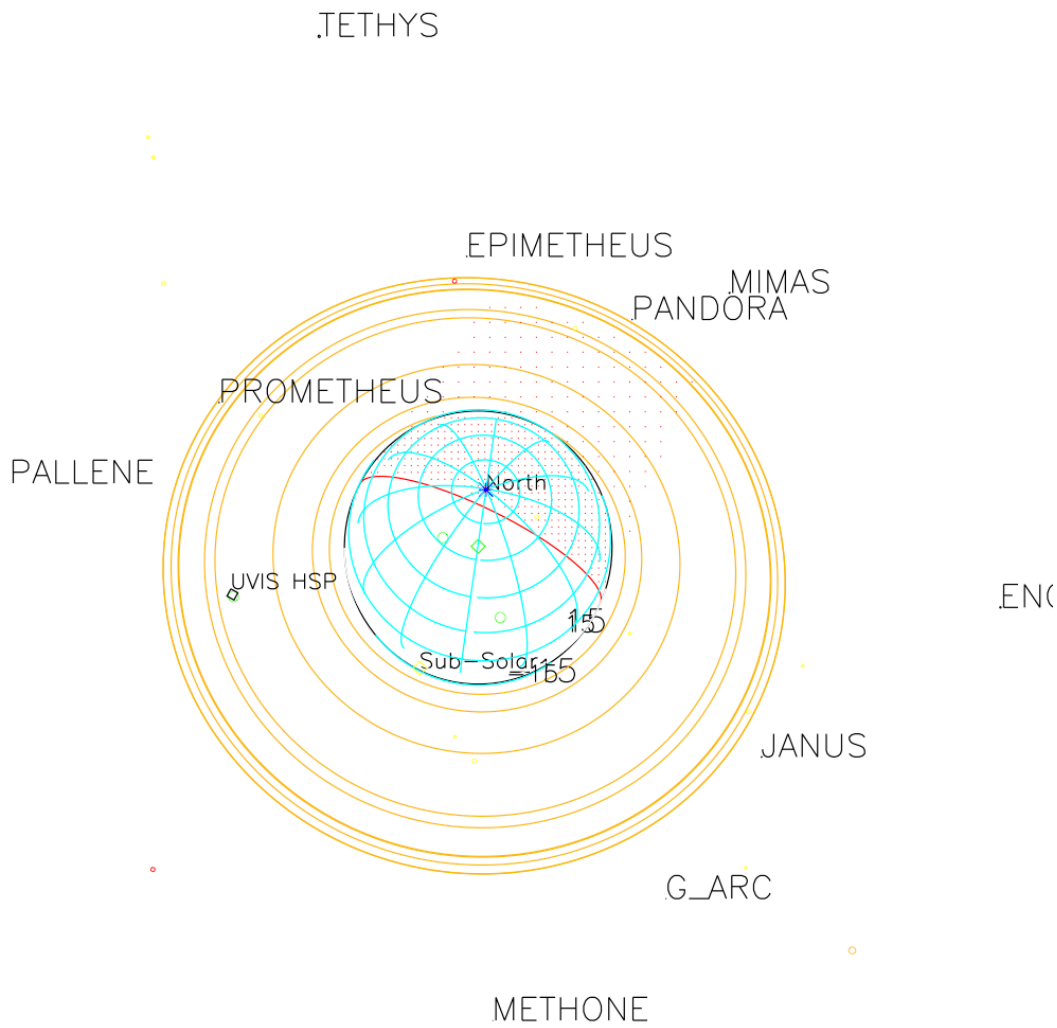
Sub-s/c lat/lon: 53.80, -8.37


BET CEN Rev 081 Ingress
HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 081 Ingress
Radial Resolution (m)
7.0
6.5
6.0
5.5
5.0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
295
290
285
280
275
270
265
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

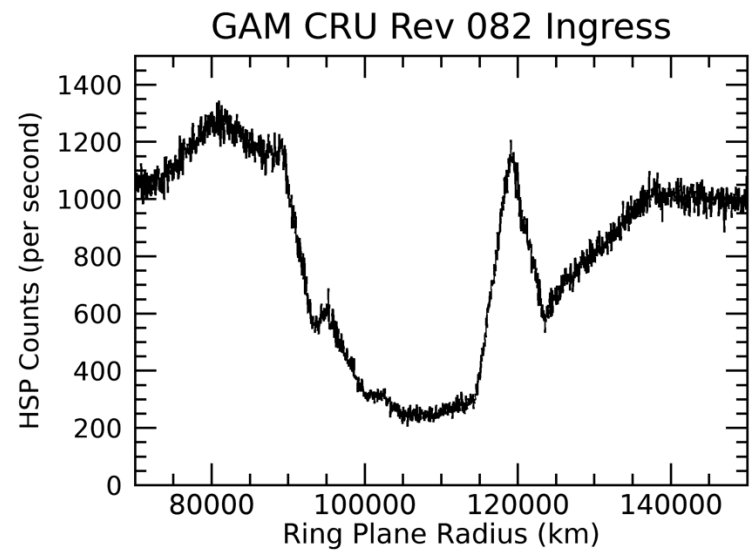


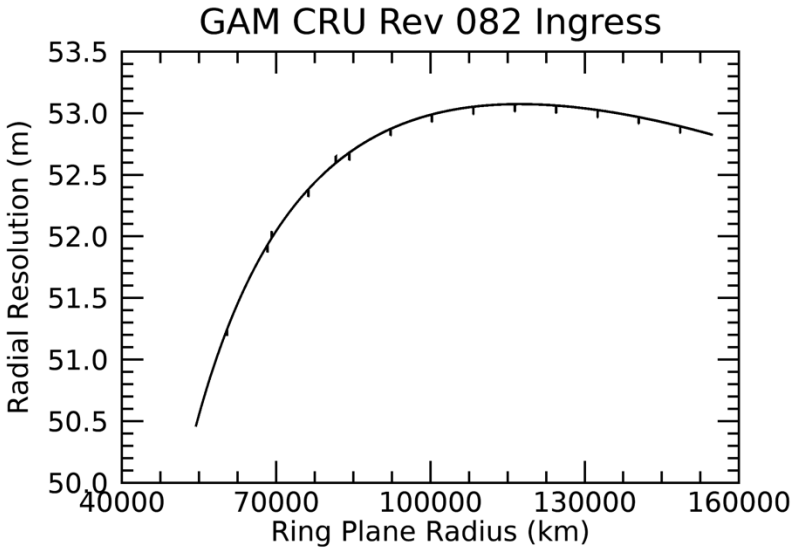
2008-231T12:51:00.000 583755.24 km

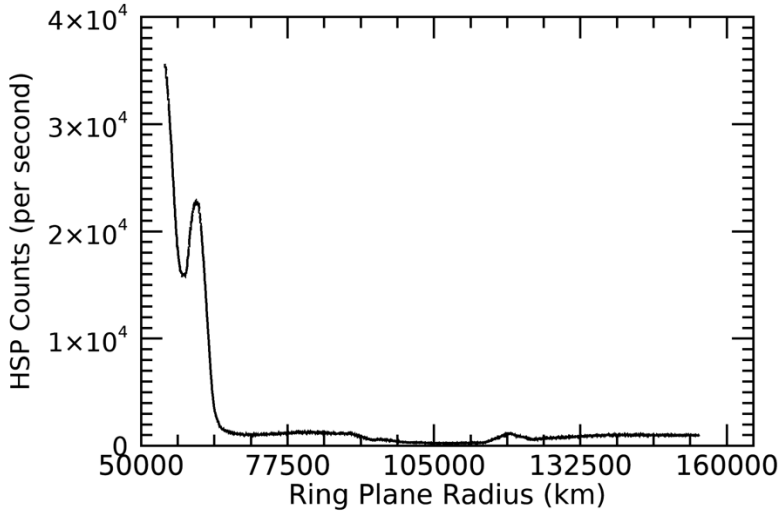
Target RA/dec: 188.81, -60.10

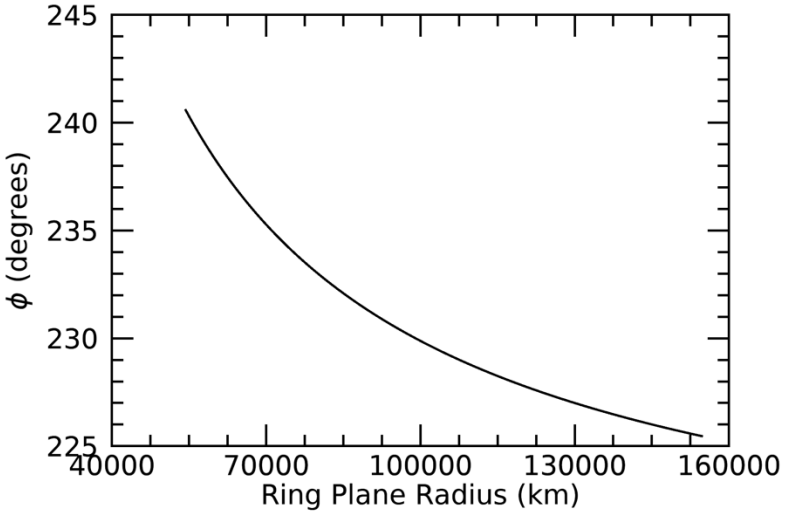
Subsolar lat/lon: -4.49, 162.91

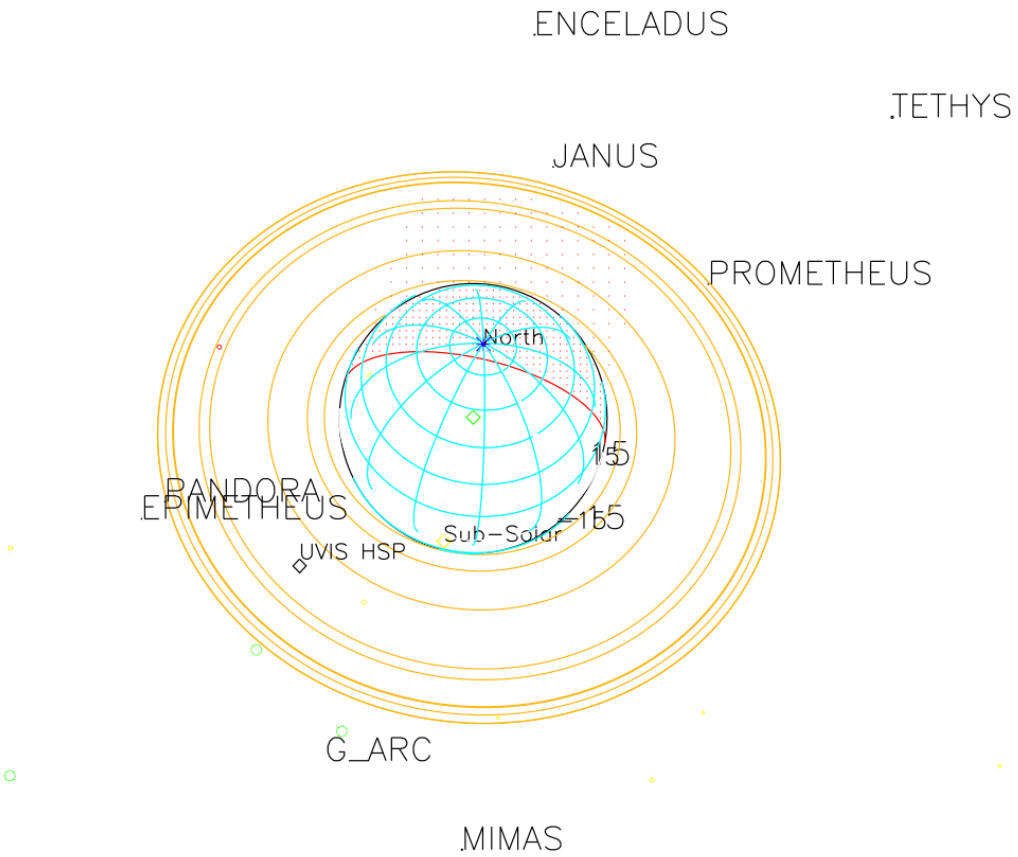
Sub-s/c lat/lon: 61.11, -179.64


GAM CRU Rev 082 Ingress
HSP Counts (per second)
0
200
400
600
800
1000
1200
1400
80000
100000
120000
140000
Ring Plane Radius (km)


GAM CRU Rev 082 Ingress
Radial Resolution (m)
50.0
50.5
51.0
51.5
52.0
52.5
53.0
53.5
40000
70000
100000
130000
160000
Ring Plane Radius (km)


HSP Counts (per second)
0
1×10^4
2×10^4
3×10^4
4×10^4
50000
77500
105000
132500
160000
Ring Plane Radius (km)


ϕ (degrees)
225
230
235
240
245
40000
70000
100000
130000
160000
Ring Plane Radius (km)

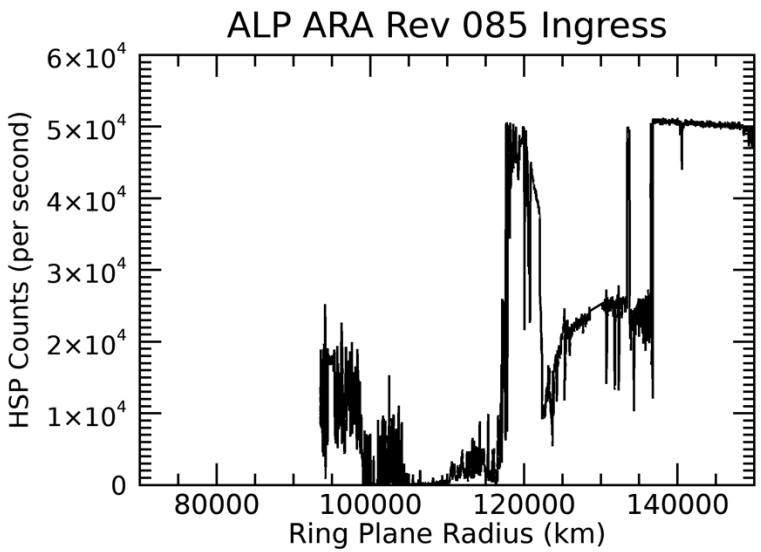


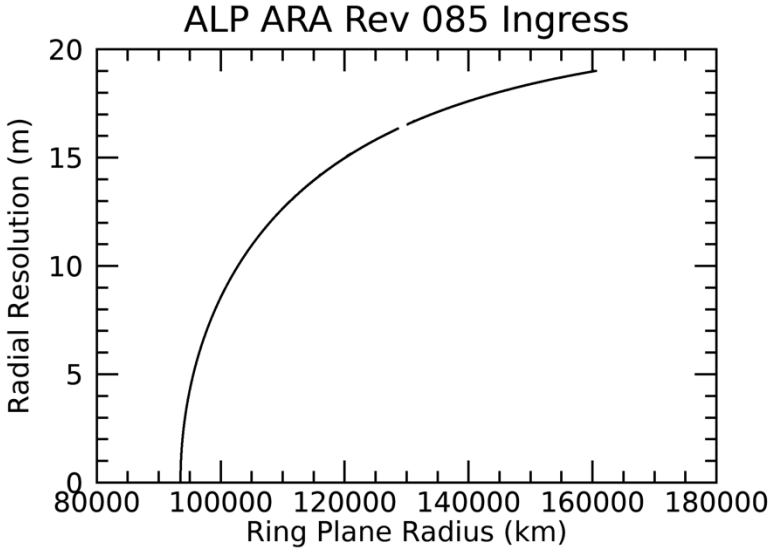
2008-238T16:09:00.000 690768.30 km

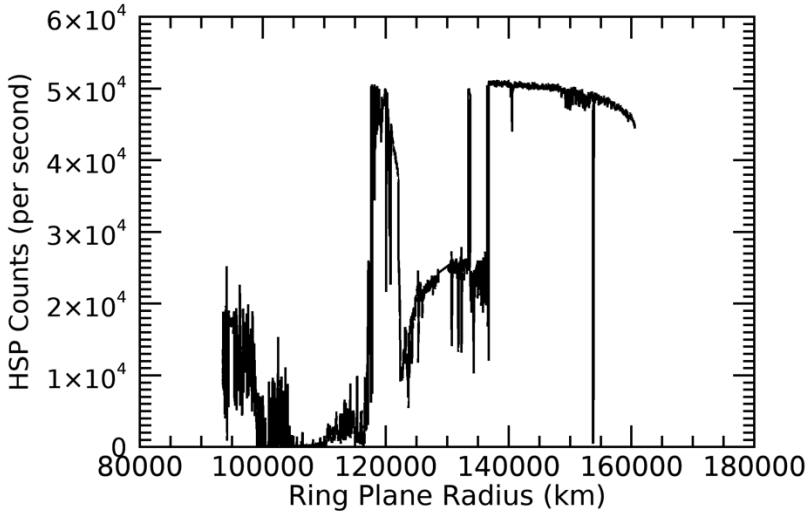
Target RA/dec: 175.95, -52.39

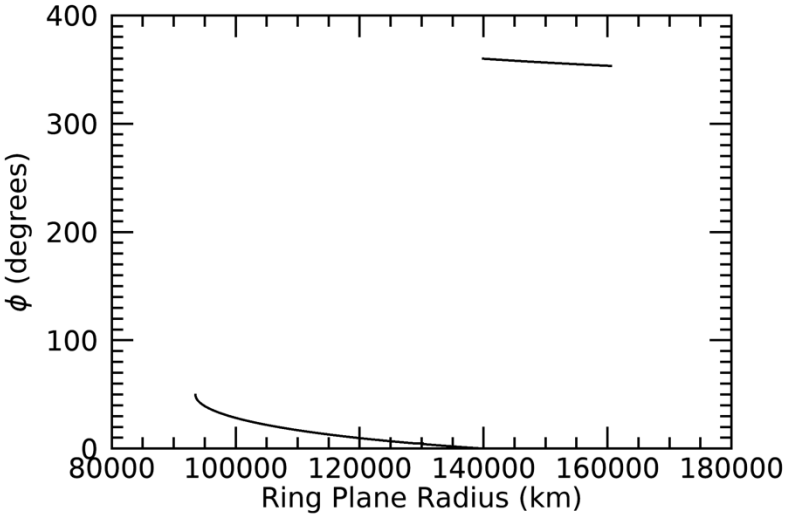
Subsolar lat/lon: -4.40, 136.09

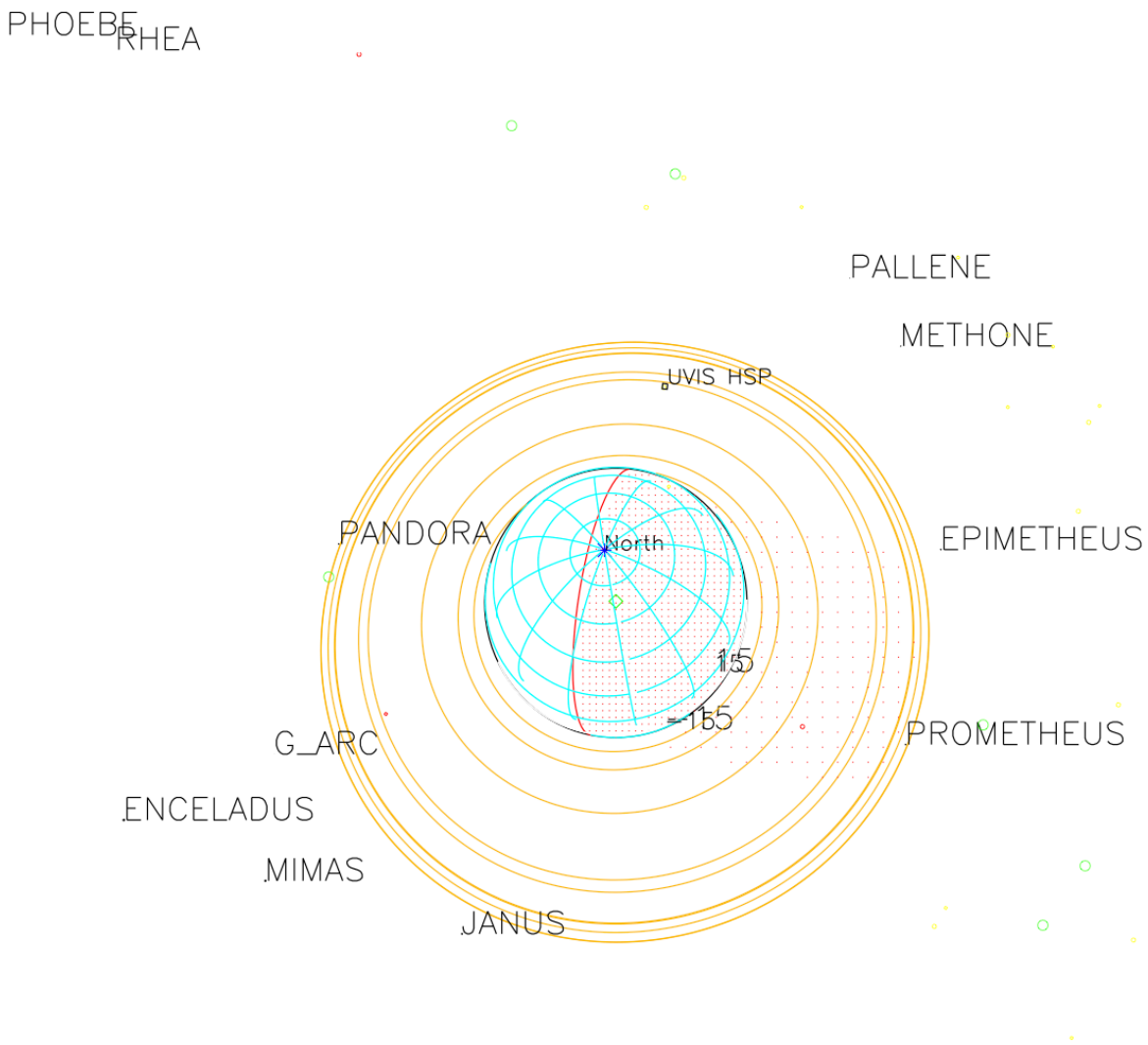
Sub-s/c lat/lon: 51.59, 140.98


ALP ARA Rev 085 Ingress
HSP Counts (per second)
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 085 Ingress
Radial Resolution (m)
20
15
10
5
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^4
5×10^4
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


ϕ (degrees)
400
300
200
100
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

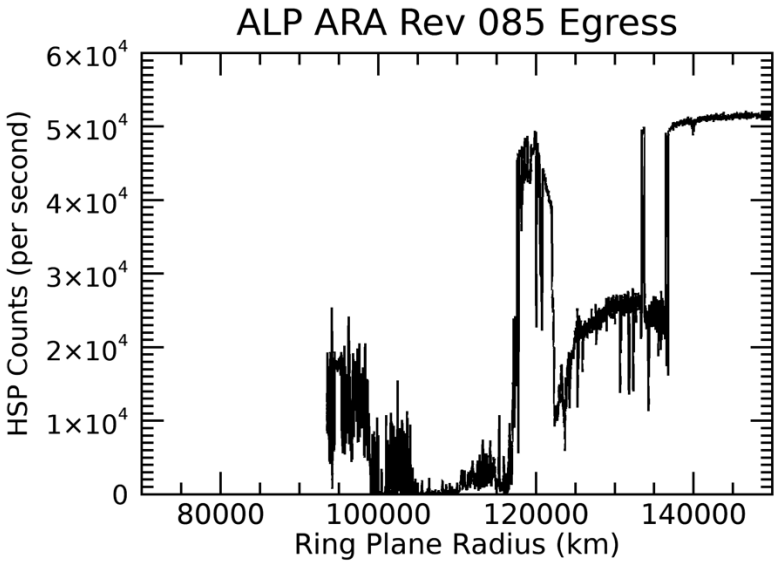


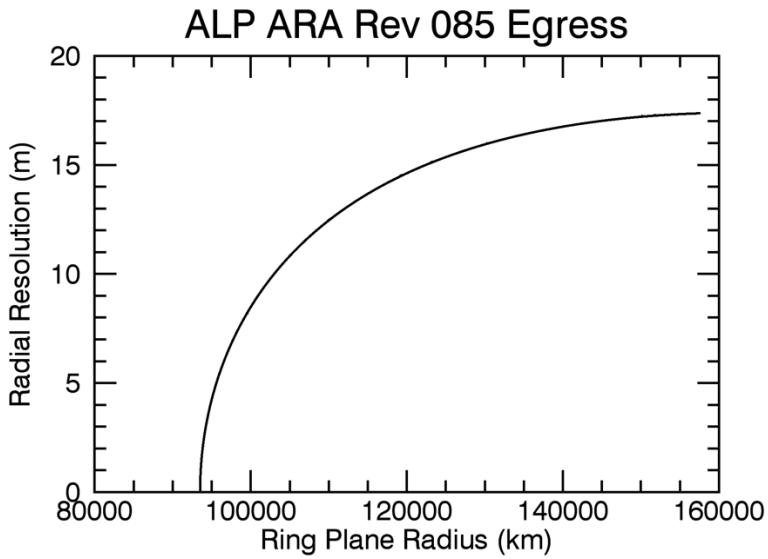
2008-261T09:39:00.000 369370.60 km

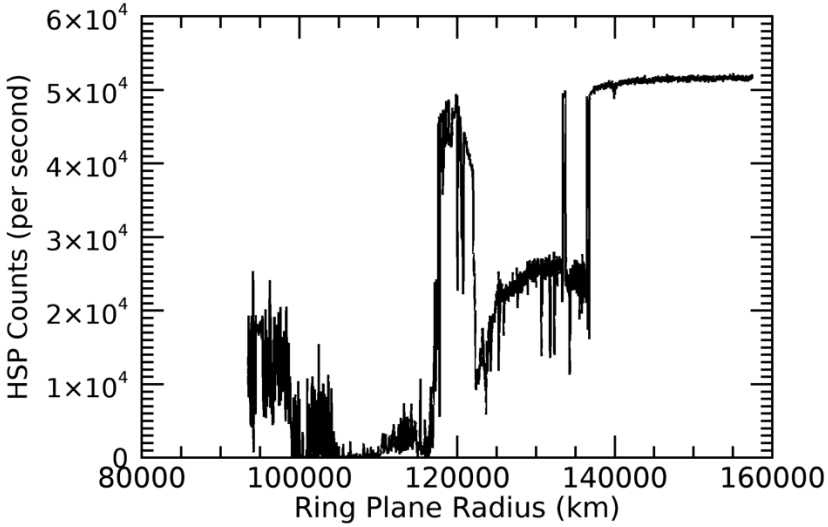
Target RA/dec: 268.17, -64.42

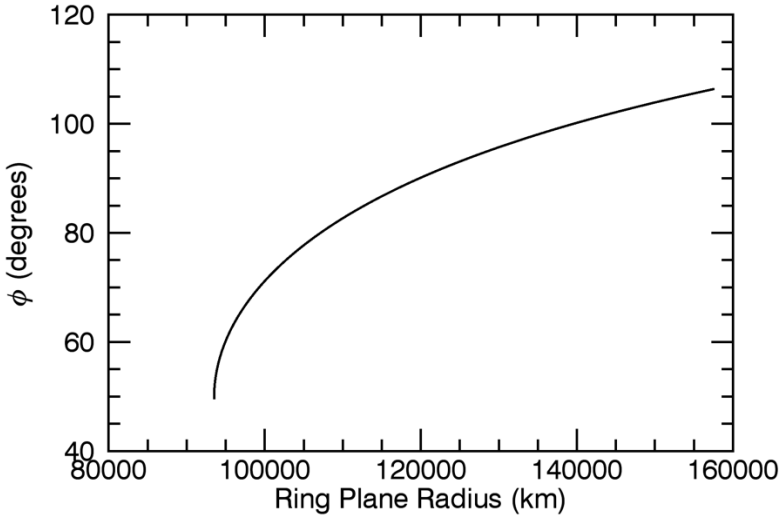
Subsolar lat/lon: -4.12, 68.13

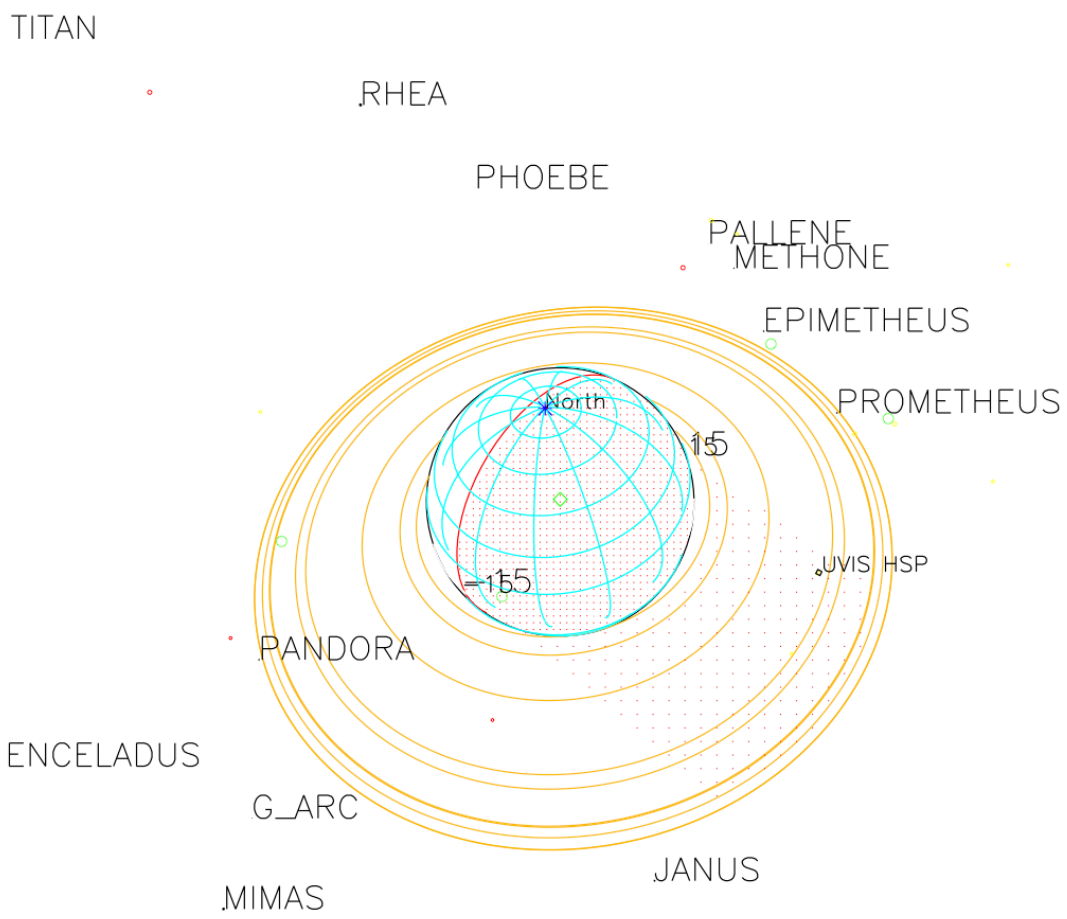
Sub-s/c lat/lon: 64.65, -176.82


ALP ARA Rev 085 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
1×10^4
2×10^4
3×10^4
4×10^4
5×10^4
6×10^4
80000
100000
120000
140000


ALP ARA Rev 085 Egress
Radial Resolution (m)
Ring Plane Radius (km)
0
5
10
15
20
80000
100000
120000
140000
160000


HSP Counts (per second)
Ring Plane Radius (km)
0
1×10^4
2×10^4
3×10^4
4×10^4
5×10^4
6×10^4
80000
100000
120000
140000
160000


ϕ (degrees)
Ring Plane Radius (km)
40
60
80
100
120
80000
100000
120000
140000
160000

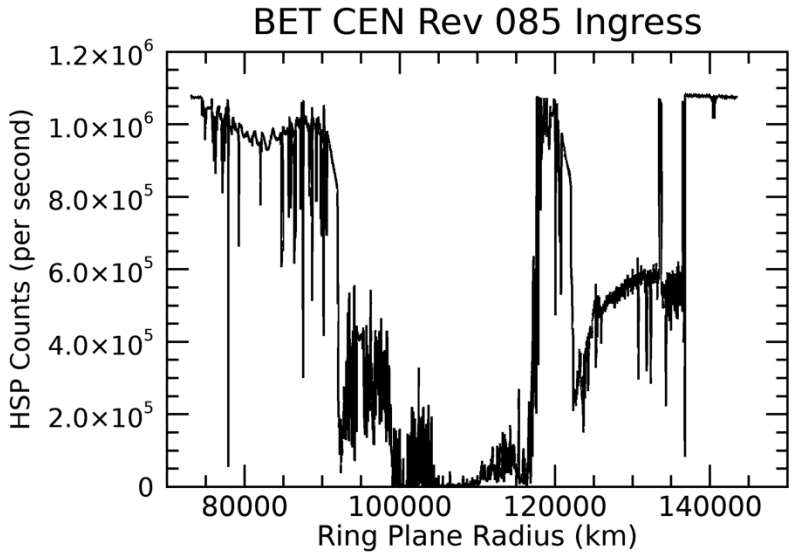


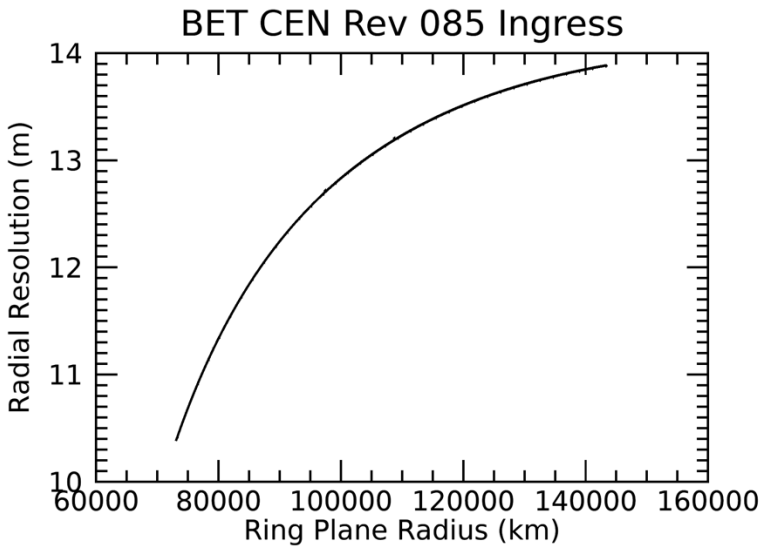
2008-261T12:40:00.000 301387.94 km

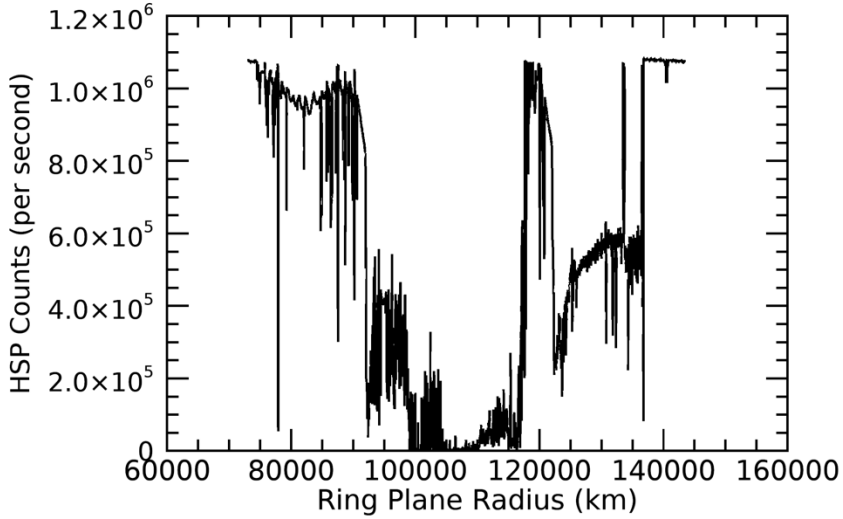
Target RA/dec: 297.24, -49.03

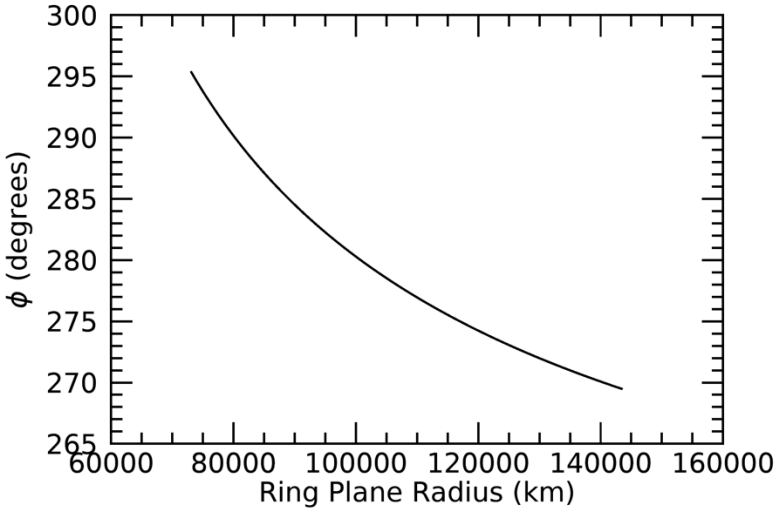
Subsolar lat/lon: -4.12, -33.78

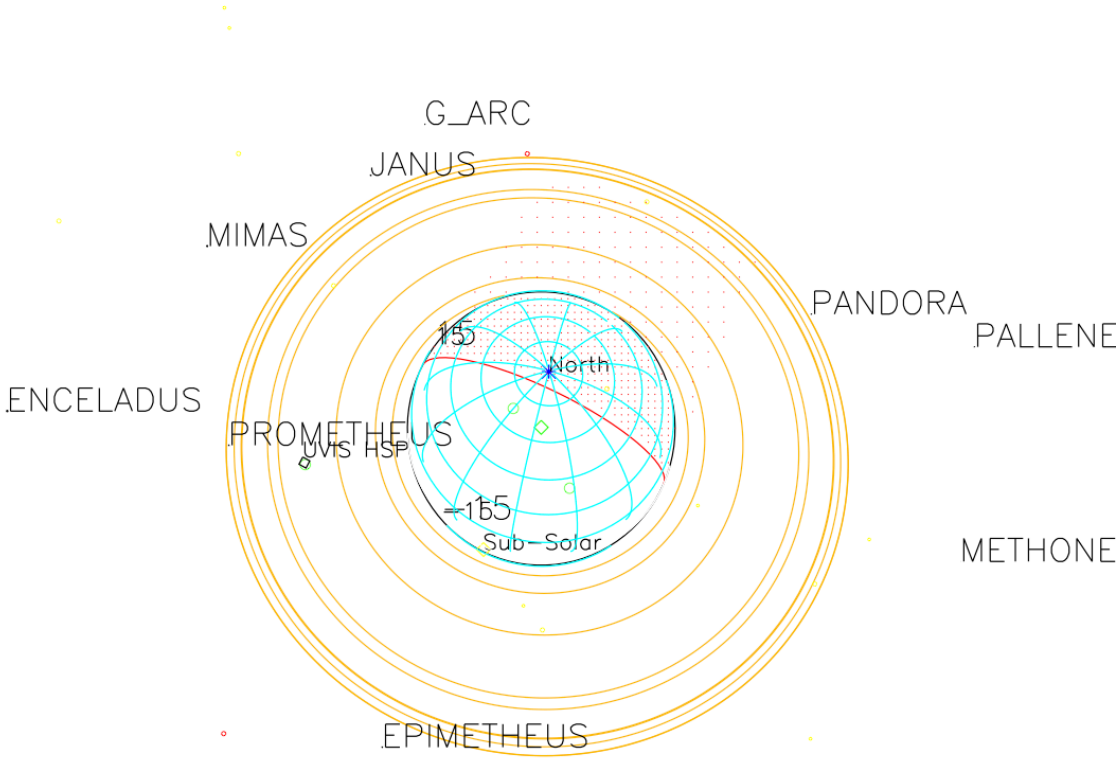
Sub-s/c lat/lon: 45.35, 105.93


BET CEN Rev 085 Ingress
HSP Counts (per second)
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 085 Ingress
Radial Resolution (m)
14
13
12
11
10
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
300
295
290
285
280
275
270
265
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

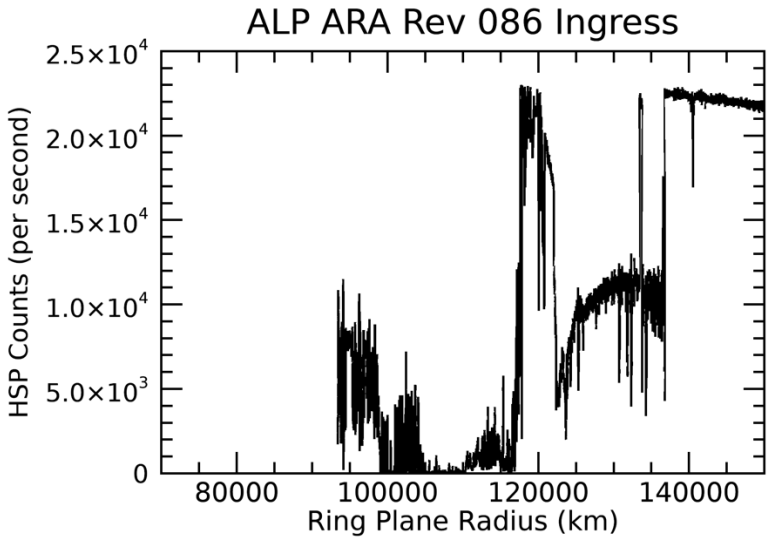


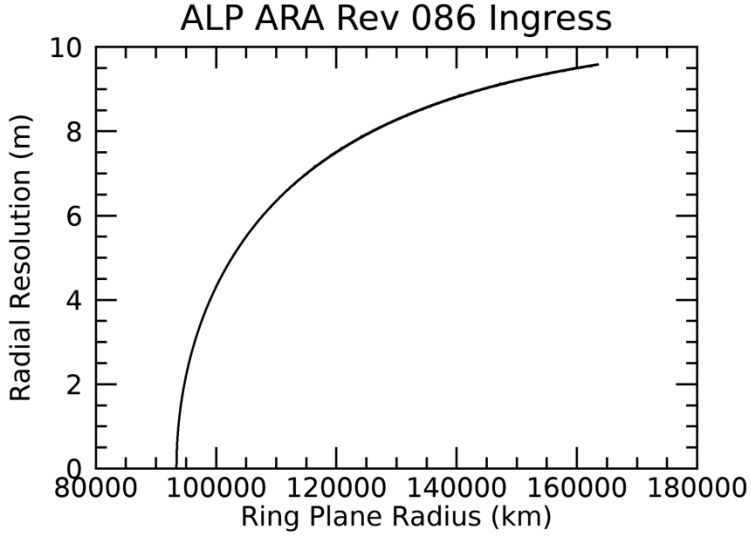
2008-261T00:26:00.000 579039.91 km

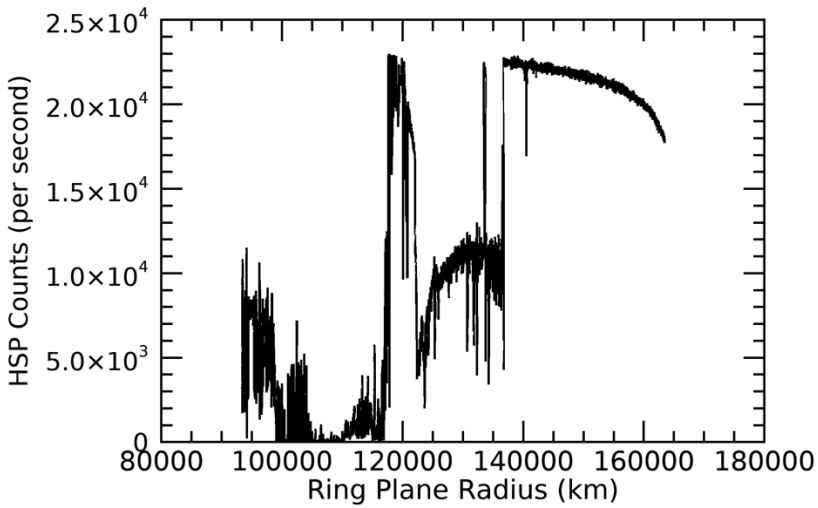
Target RA/dec: 189.45, -60.52

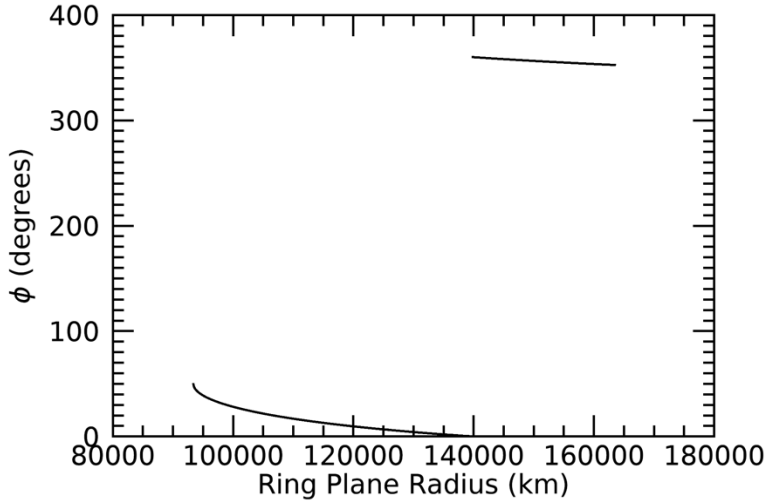
Subsolar lat/lon: -4.12, 19.49

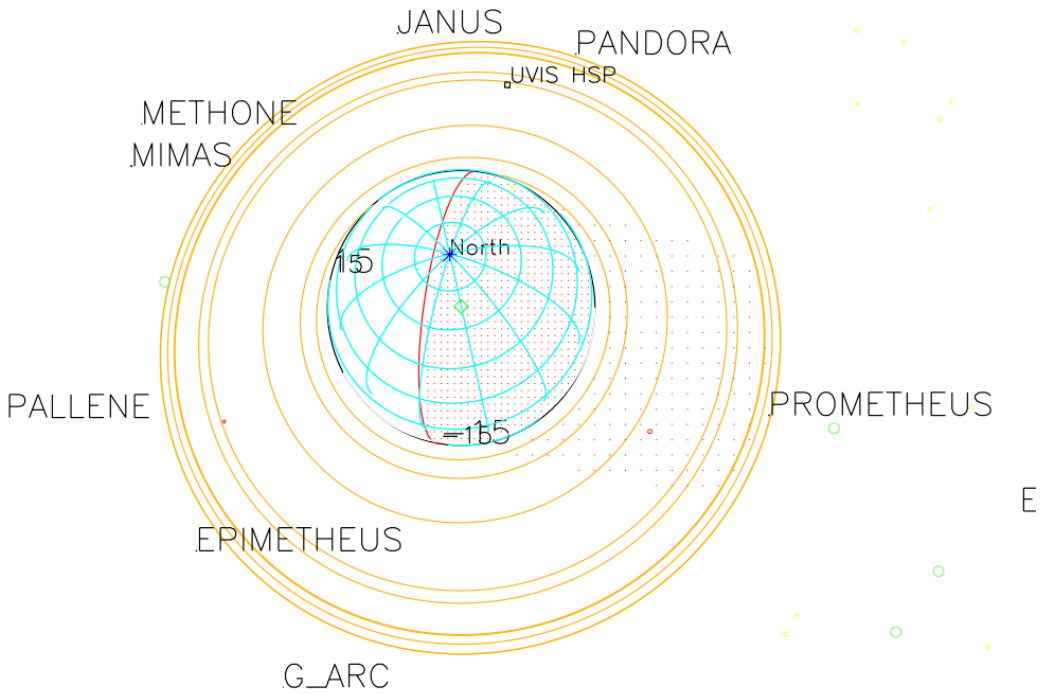
Sub-s/c lat/lon: 61.64, 36.63


ALP ARA Rev 086 Ingress
HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 086 Ingress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


ϕ (degrees)
400
300
200
100
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

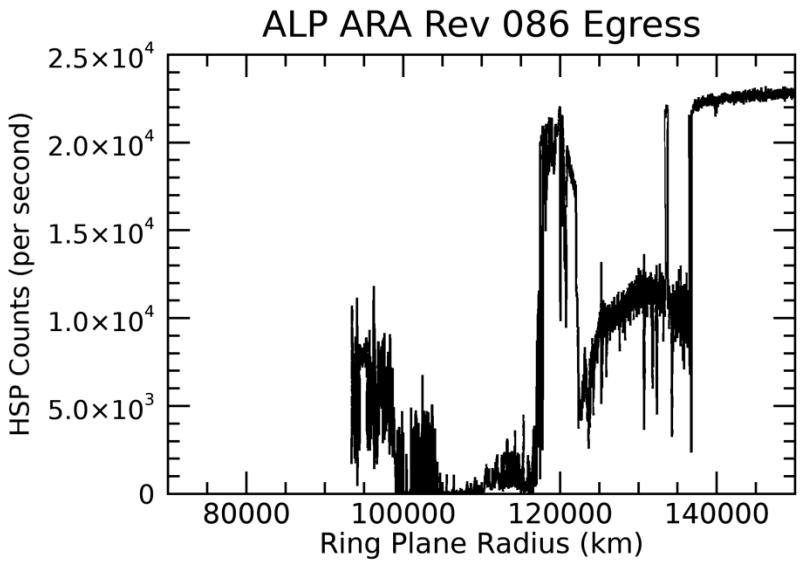


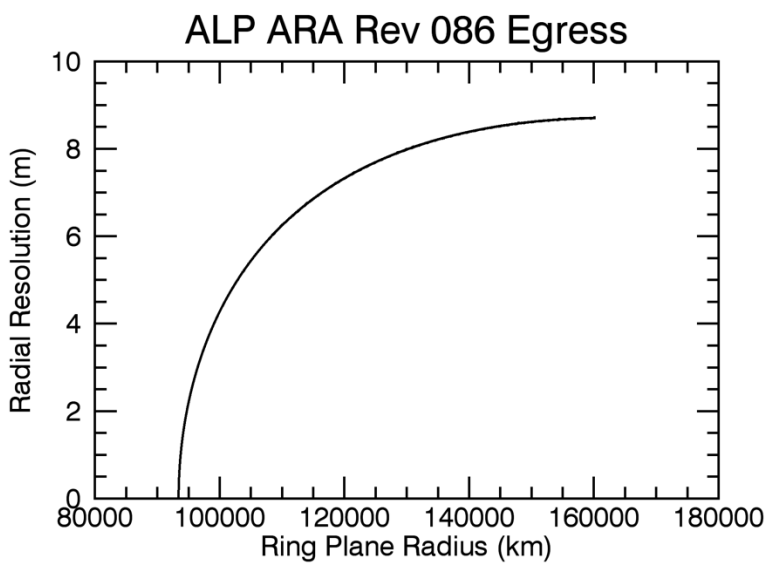
2008-268T18:27:00.000 369961.64 km

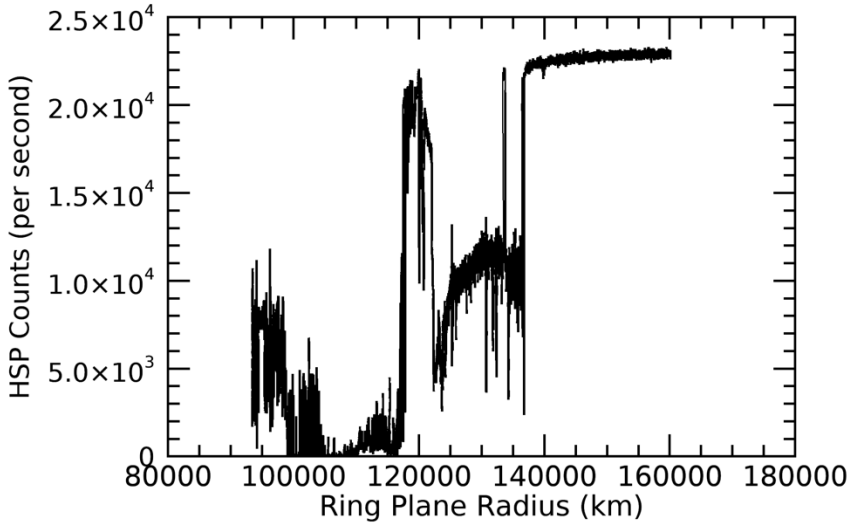
Target RA/dec: 267.75, -64.53

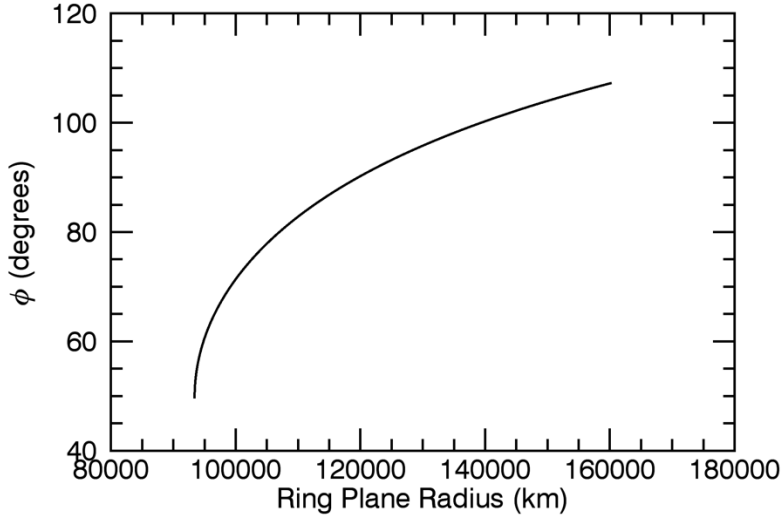
Subsolar lat/lon: -4.03, -144.49

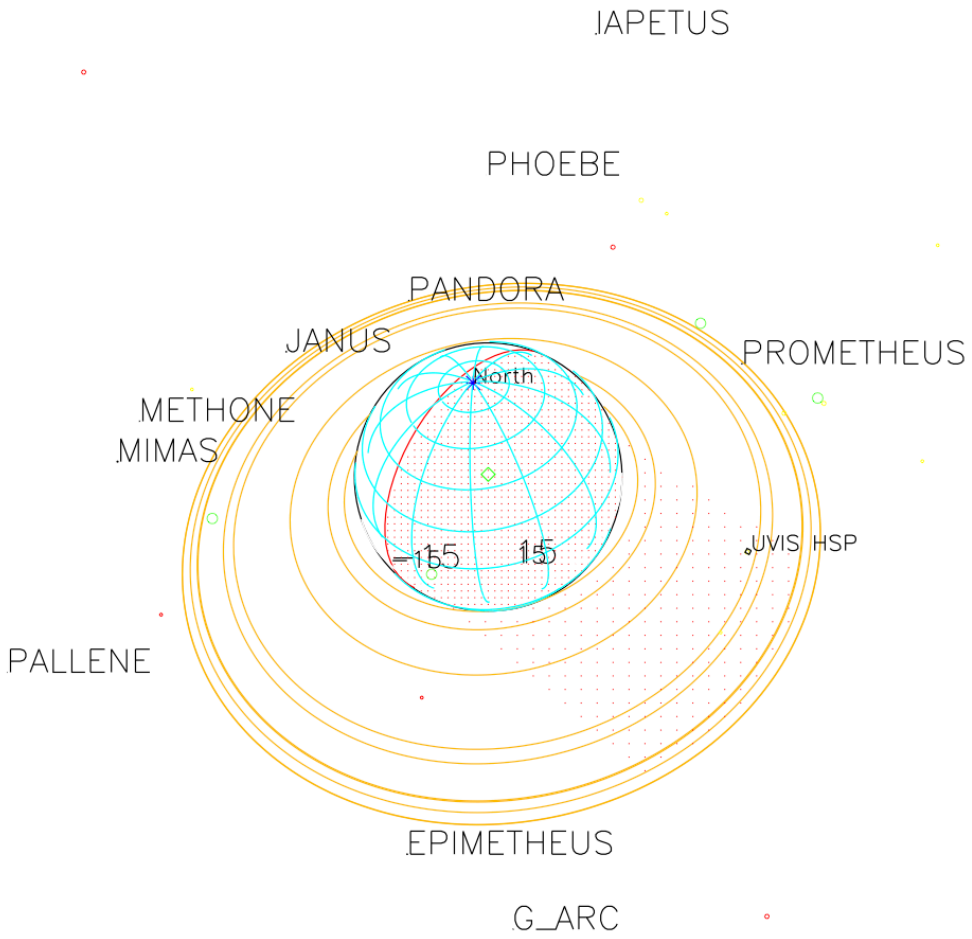
Sub-s/c lat/lon: 64.81, -30.07


ALP ARA Rev 086 Egress
HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 086 Egress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)


φ (degrees)
120
100
80
60
40
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

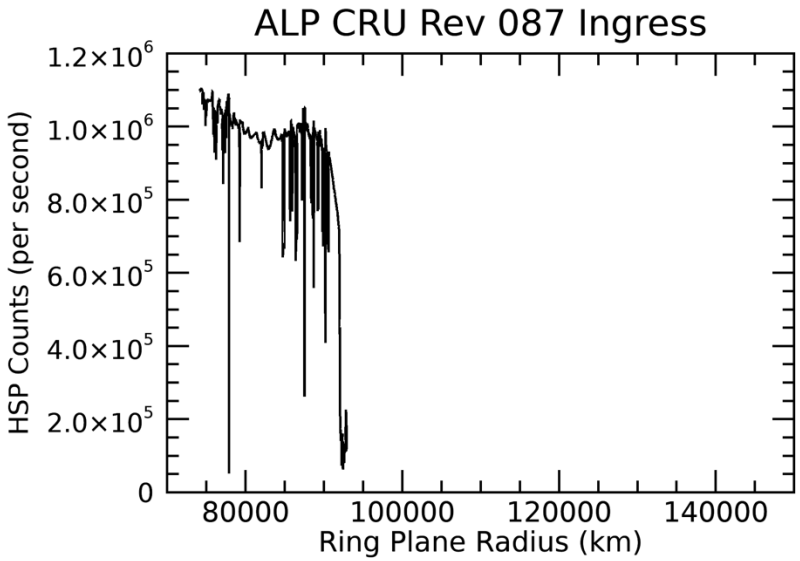


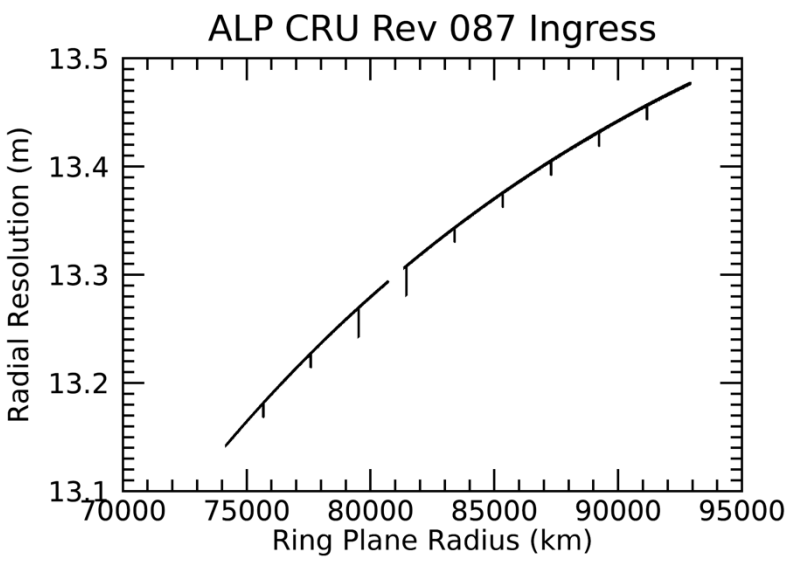
2008-268T21:32:00.000 300545.93 km

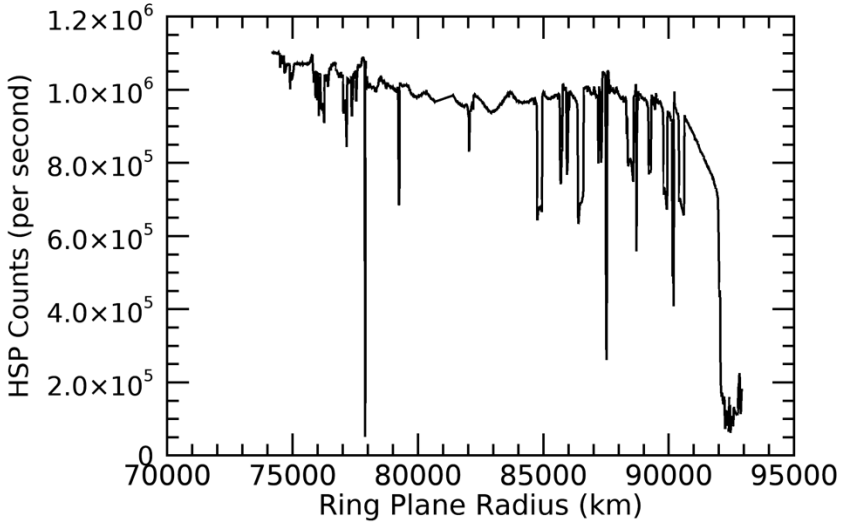
Target RA/dec: 297.48, -48.76

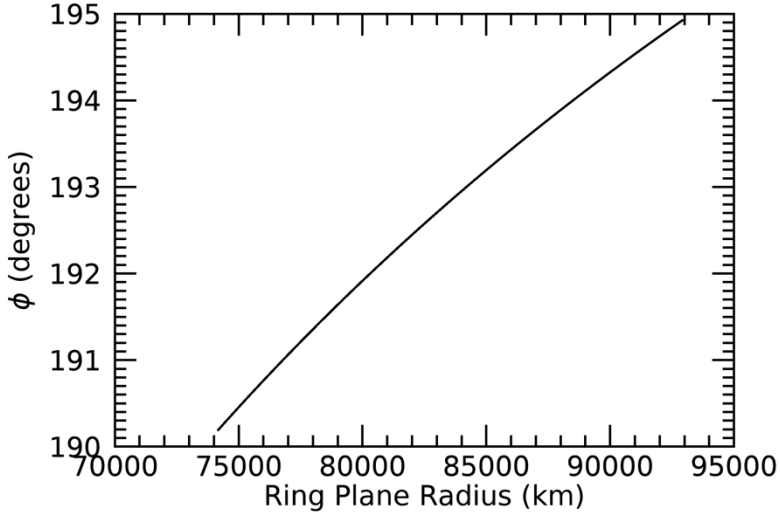
Subsolar lat/lon: -4.02, 111.35

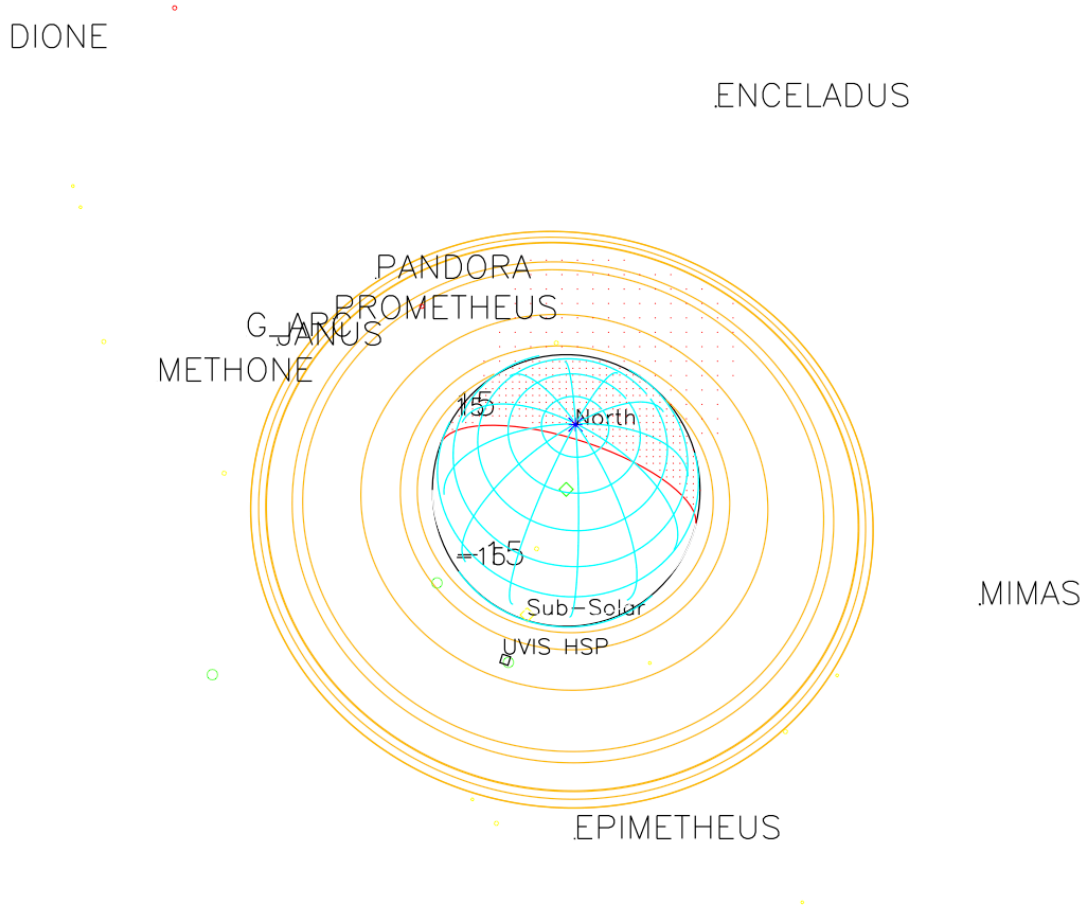
Sub-s/c lat/lon: 45.07, -109.00


ALP CRU Rev 087 Ingress
HSP Counts (per second)
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP CRU Rev 087 Ingress
Radial Resolution (m)
13.5
13.4
13.3
13.2
13.1
70000
75000
80000
85000
90000
95000
Ring Plane Radius (km)


HSP Counts (per second)
1.2×10^6
1.0×10^6
8.0×10^5
6.0×10^5
4.0×10^5
2.0×10^5
0
70000
75000
80000
85000
90000
95000
Ring Plane Radius (km)


ϕ (degrees)
195
194
193
192
191
190
70000
75000
80000
85000
90000
95000
Ring Plane Radius (km)

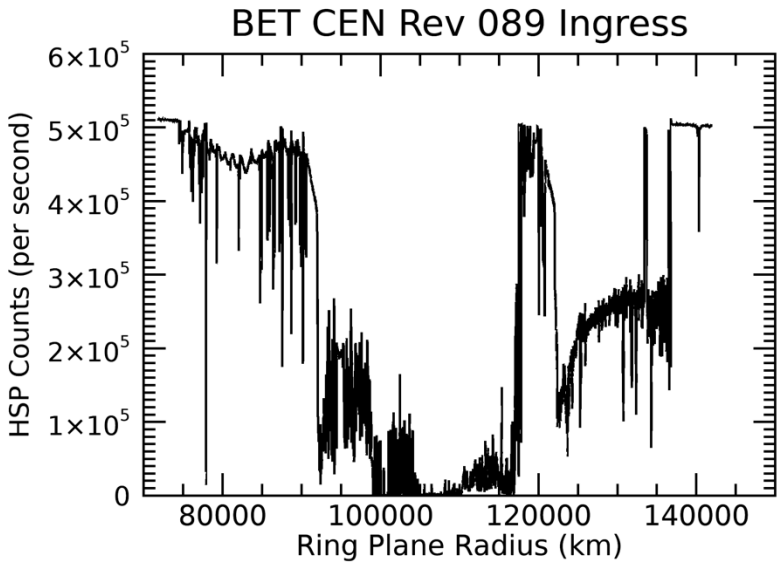


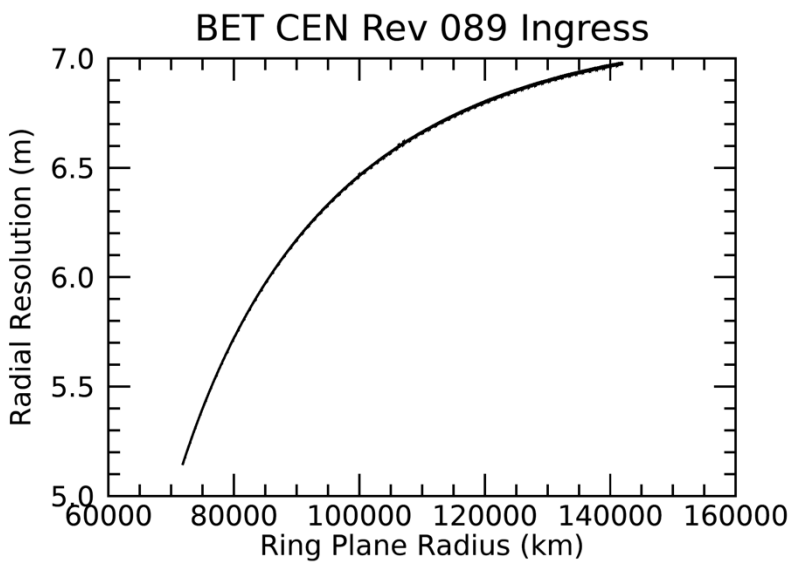
2008-275T15:29:00.000 632214.09 km

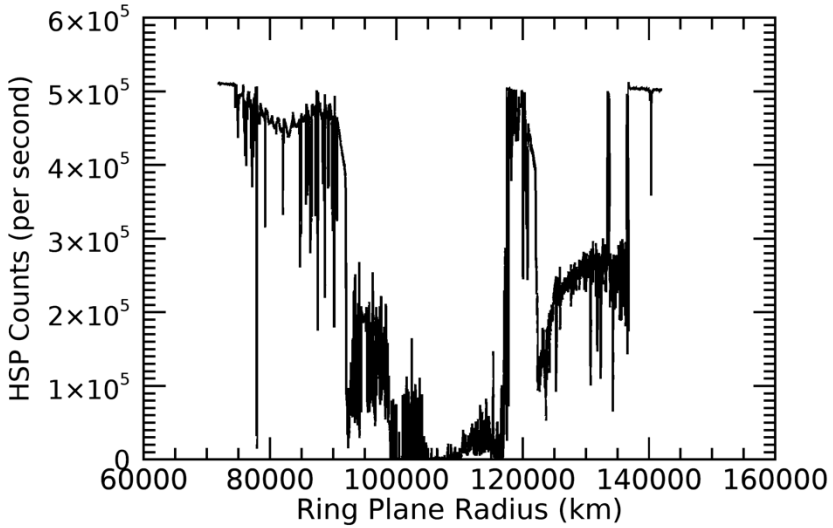
Target RA/dec: 181.45, -56.44

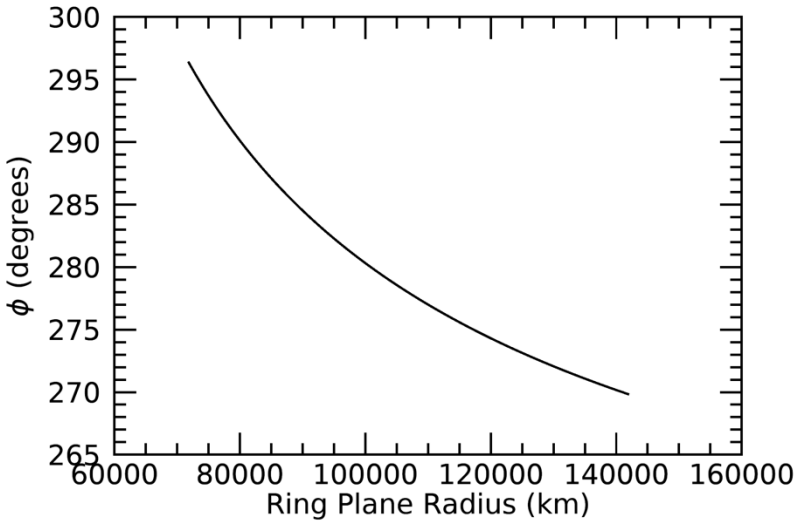
Subsolar lat/lon: -3.94, 40.40

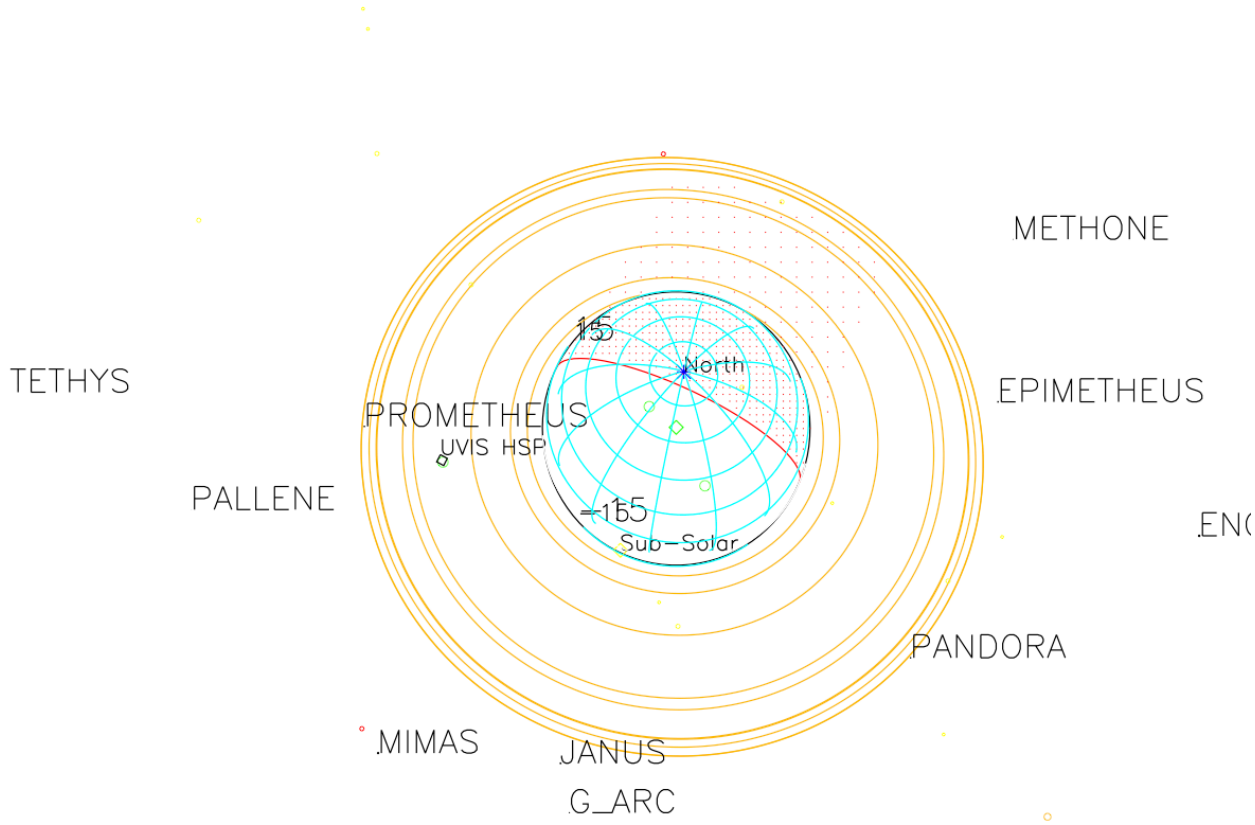
Sub-s/c lat/lon: 56.46, 49.12


BET CEN Rev 089 Ingress
HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET CEN Rev 089 Ingress
Radial Resolution (m)
7.0
6.5
6.0
5.5
5.0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
6×10^5
5×10^5
4×10^5
3×10^5
2×10^5
1×10^5
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
300
295
290
285
280
275
270
265
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

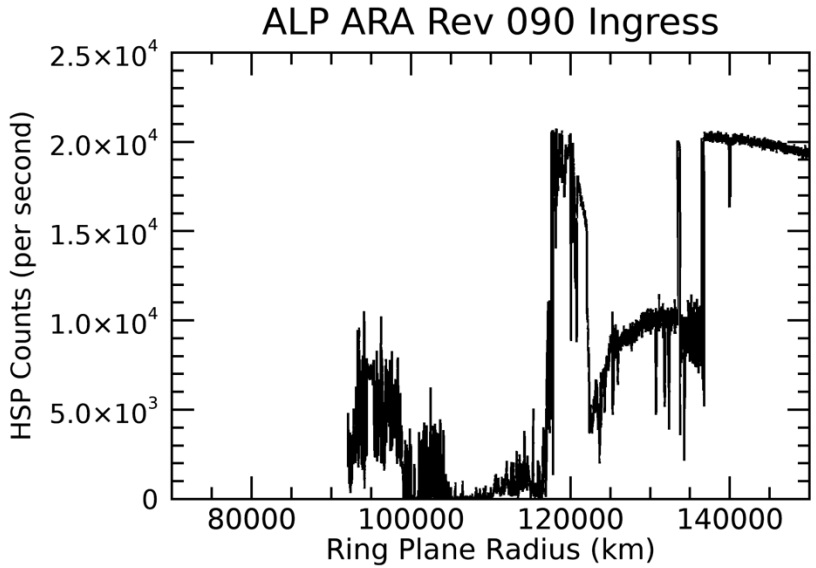


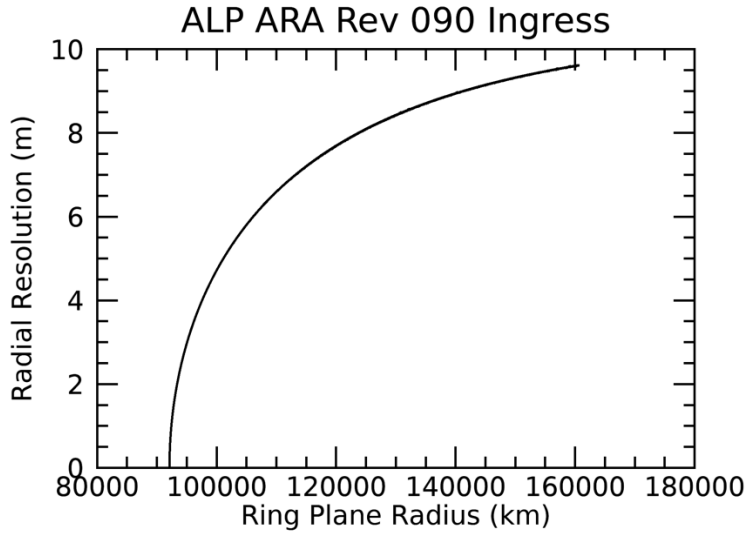
2008-290T10:28:00.000 574290.24 km

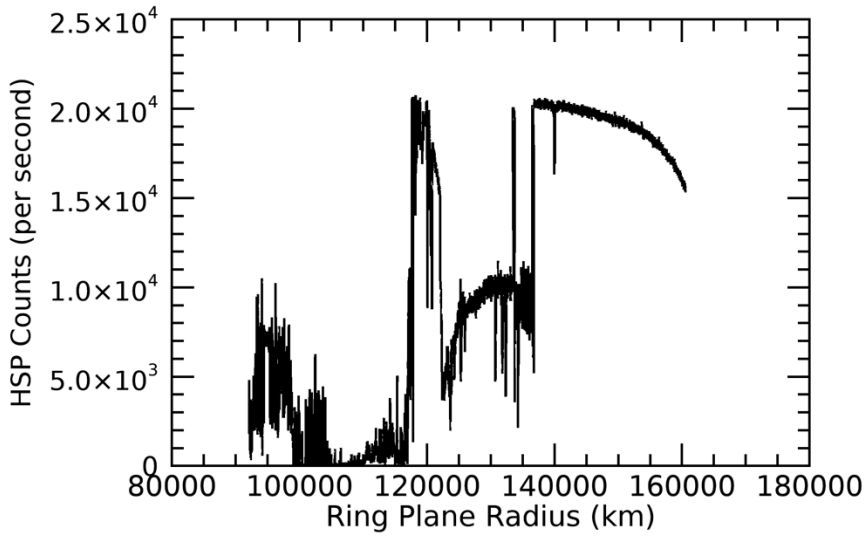
Target RA/dec: 189.51, -60.61

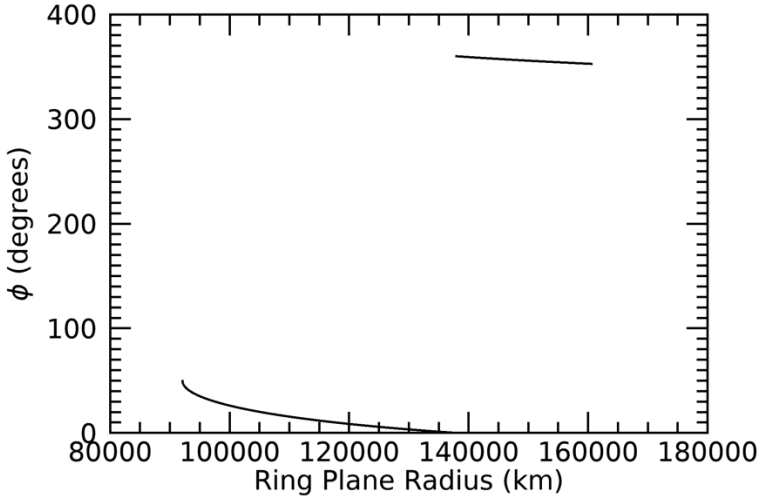
Subsolar lat/lon: -3.75, -71.57

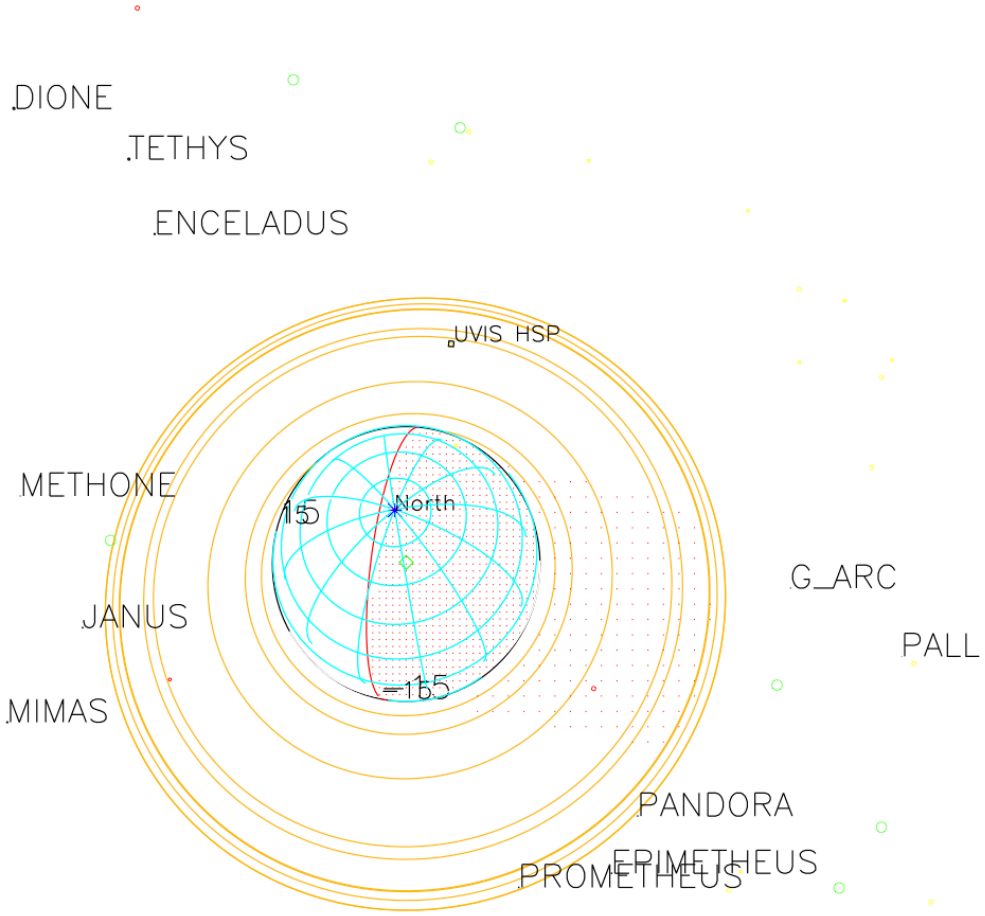
Sub-s/c lat/lon: 61.74, -55.30


ALP ARA Rev 090 Ingress
HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)

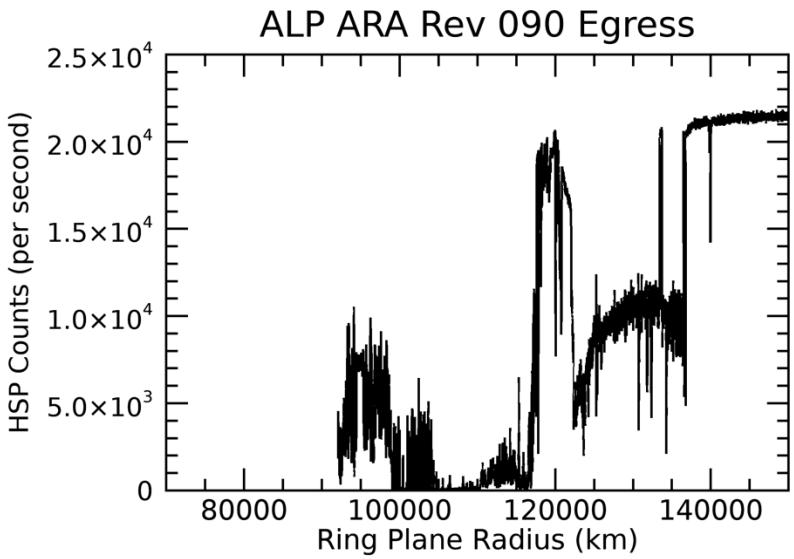

ALP ARA Rev 090 Ingress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

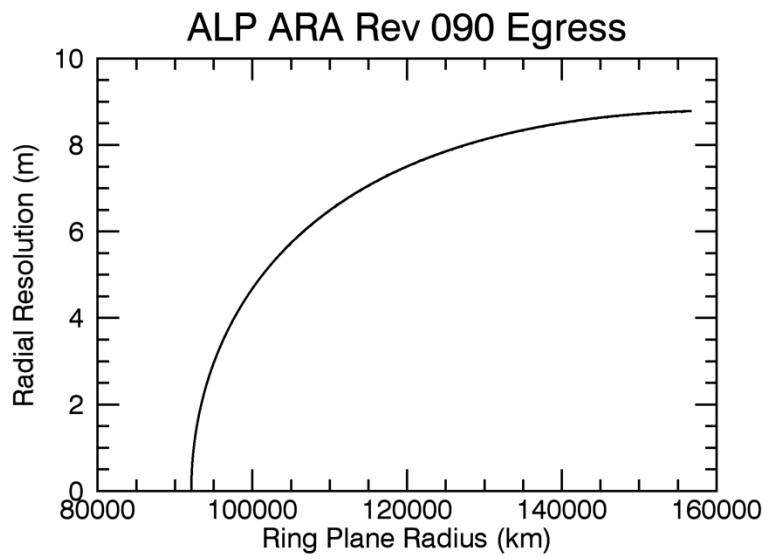

HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

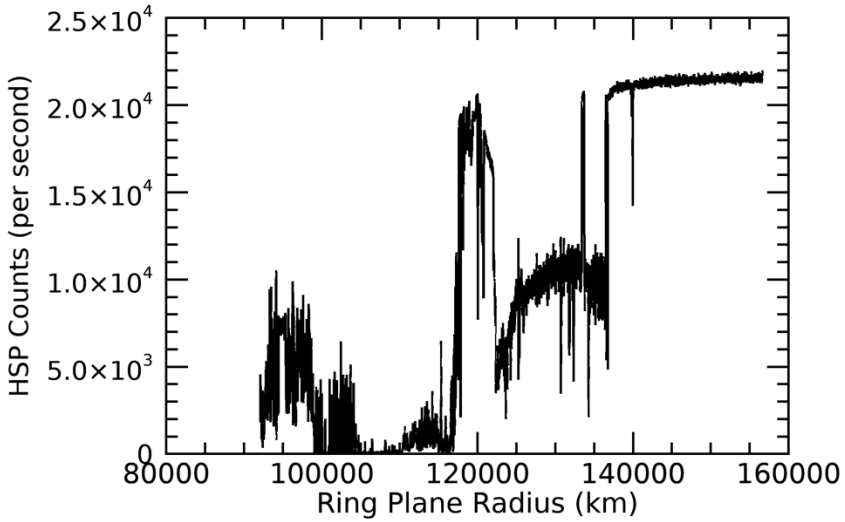

ϕ (degrees)
400
300
200
100
0
80000
100000
120000
140000
160000
180000
Ring Plane Radius (km)

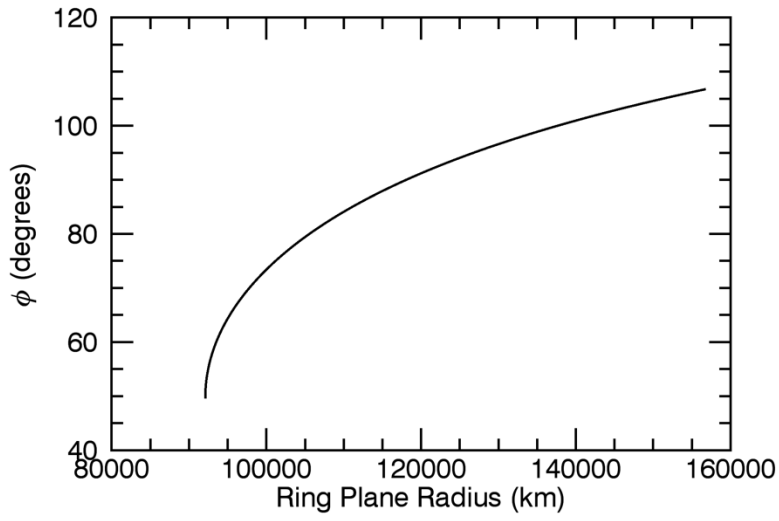


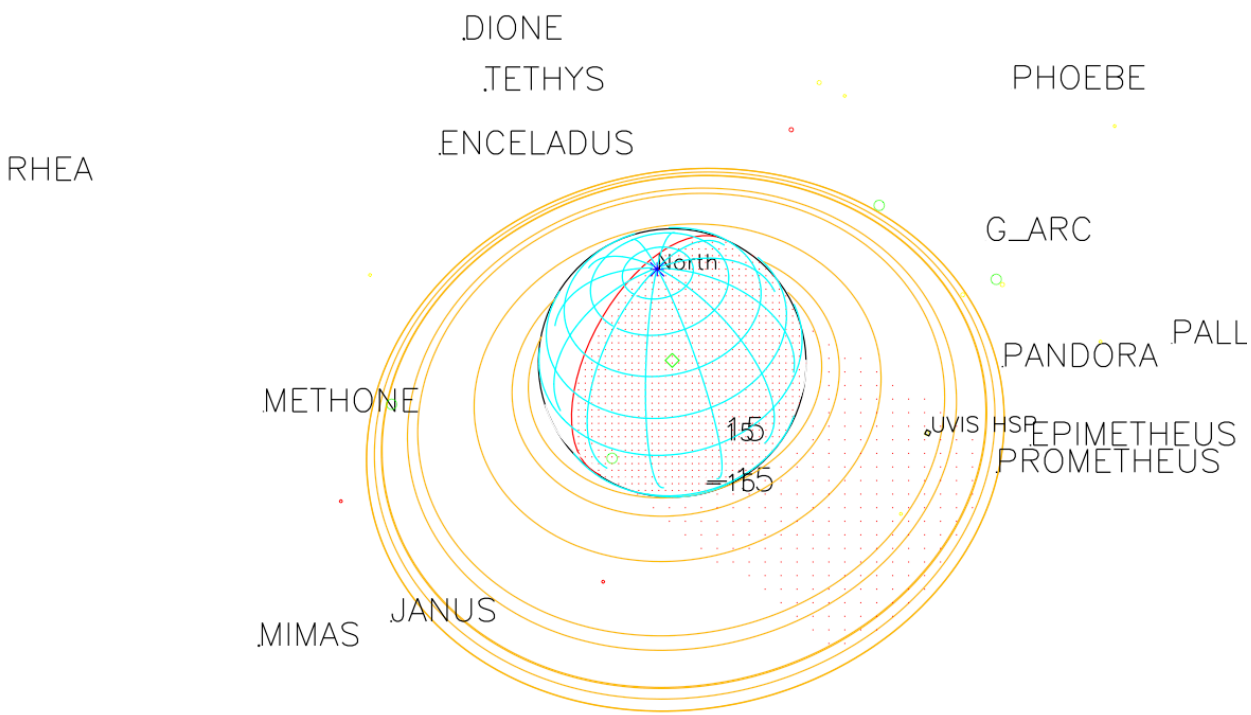
2008-298T02:33:00.000 368306.56 km
Target RA/dec: 267.66, -64.39
Subsolar lat/lon: -3.66, -170.24
Sub-s/c lat/lon: 64.68, -56.93


ALP ARA Rev 090 Egress
HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP ARA Rev 090 Egress
Radial Resolution (m)
10
8
6
4
2
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
2.5×10^4
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
120
100
80
60
40
80000
100000
120000
140000
160000
Ring Plane Radius (km)



2008−298T05:34:00.000 300671.25 km

Target RA/dec: 296.93, −48.96

Subsolar lat/lon: −3.65, 87.85

Sub−s/c lat/lon: 45.33, −133.92