Cassini Ultraviolet Imaging Spectrograph
UVIS HSP

Ring Stellar Occultation Atlas

Volume 6: Rev 124 – Rev 194

Version: 1.4
February 18, 2019

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.

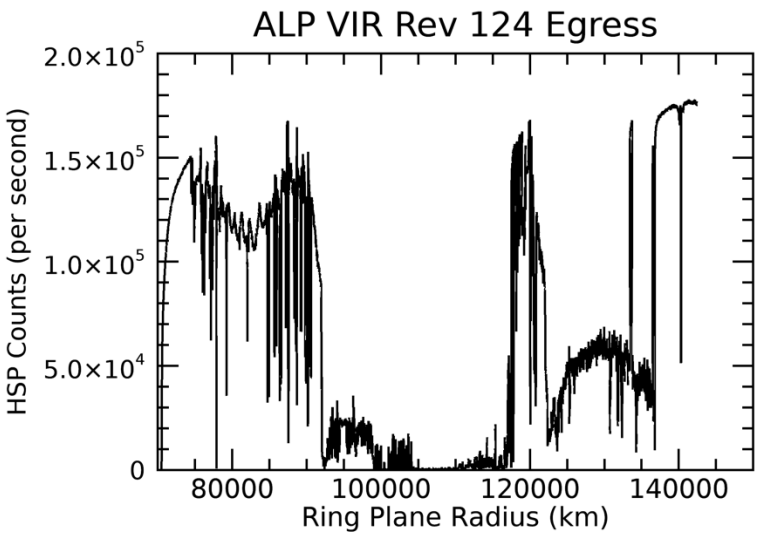
On the page following the data plots, a geometry visualization is shown at a time near the middle of the occultation. The position of the UVIS HSP field of view is labeled on each of these plots. Occultations that cut a chord across the rings, are presented here as separate "Ingress" and "Egress" occultations, 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.

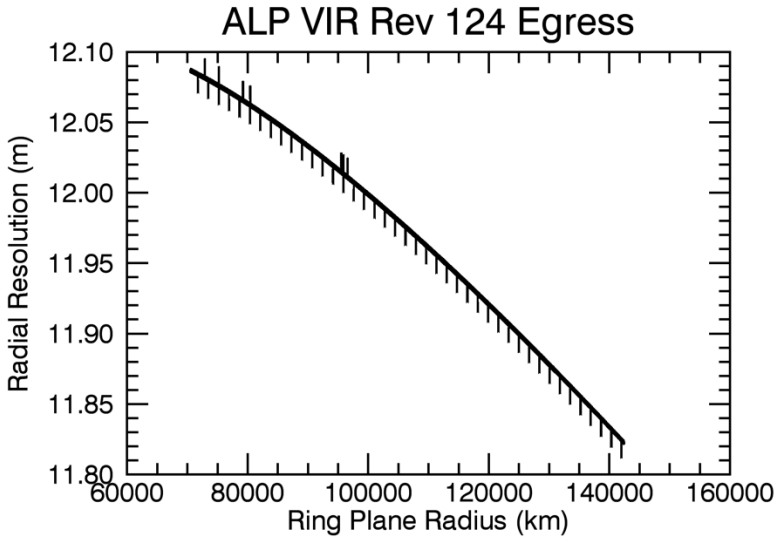
Document assembled by Joshua Colwell, UVIS Co-Investigator, University of Central Florida, with the assistance of Stephanie Eckert Grant, Richard Jerousek, and Tina Notrika, UCF.

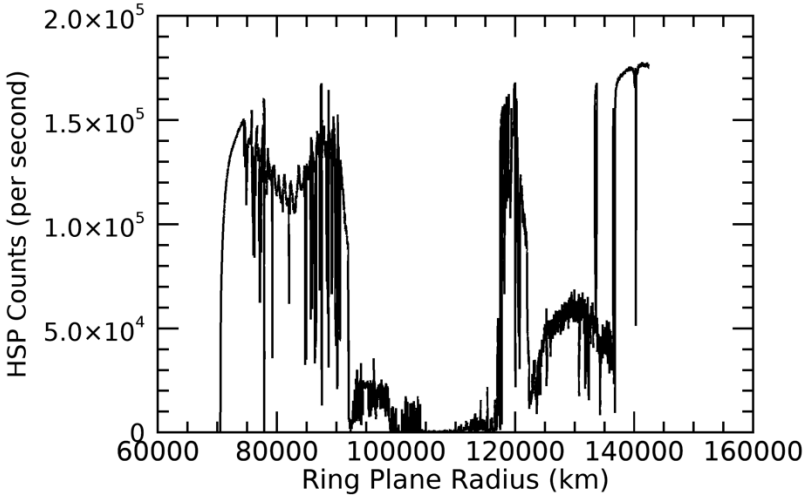
References

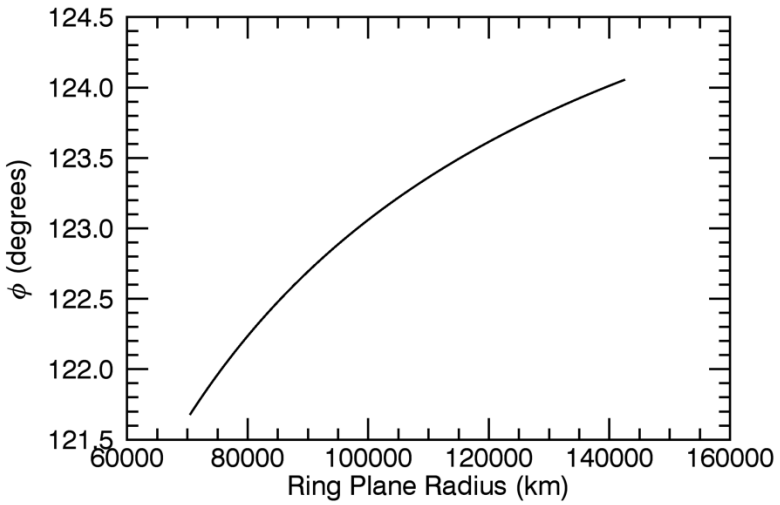
1. Colwell, J. E., L. W. Esposito, D. Pettis, M. Sremčević, R. G. Jerousek, E. T. Bradley 2010. Cassini UVIS Stellar Occultation Observations of Saturn's Rings. *Astron. J.* **140**, 1569-1578, doi:10.1088/0004-6256/140/6/1569.
2. Esposito, L. W., J. E. Colwell, and W. E. McClintock 1998. Cassini UVIS 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.

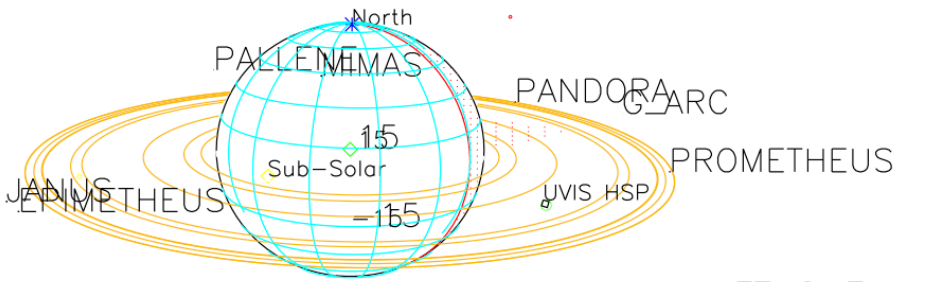
Star		Rev	Ing/Eg	Year/Day	B	ϕ	Radius	Duration (min)
α	VIR	124	E	2010-011	17.3	121.7-124.1	70493-142430	100.2
β	LIB	124	E	2010-011	15.8	236.9-221.5	115070-123509	45.9
λ	AQL	132	E	2010-149	7.5	313.2-314.6	130034-130070	20.9
λ	AQL	132	I	2010-149	7.5	289.0-313.2	142391-130034	395.3
α	VIR	134	I	2010-186	17.3	294.1-264.3	143681- 72604	125.2
β	ORI	136	E	2010-226	3.1	100.7- 67.7	87262-130639	36.1
β	ORI	138	E	2010-265	3.1	119.3- 61.6	81869-148807	61.2
β	ORI	138	I	2010-265	3.1	142.6-119.3	88923- 81869	16.9
ι	ORI	159	E	2012-004	1.2	51.3- 88.8	69002-146967	100.2
α	CMA	168	I	2012-180	13.5	240.3-250.2	108881- 73191	30.2
κ	CMA	168	E	2012-181	29.3	150.2-118.7	130134-150501	79.9
κ	CMA	168	I	2012-181	29.3	185.3-150.2	155886-130134	91.1
α	CMA	169	I	2012-204	13.5	242.5-261.0	99319- 55790	38.5
ζ	CMA	169	E	2012-204	26.2	143.5-109.0	121733-145664	78.8
ζ	CMA	169	I	2012-204	26.2	181.4-143.5	151402-121733	88.9
ζ	PUP	171	E	2012-247	38.6	159.8-105.2	86532-145478	142.3
ζ	PUP	171	I	2012-247	38.6	214.3-159.8	144270- 86532	140.9
γ	PEG	172	E	2012-267	-20.3	29.9- 81.8	126304-142395	110.3
γ	PEG	172	I	2012-267	-20.3	29.9- 81.8	137986-126304	93
α	VIR	173	E	2012-293	17.3	62.8-103.3	109357-143407	111.1
α	VIR	173	I	2012-293	17.3	20.7- 62.8	147210-109357	118
ε	CMA	173	E	2012-292	26	314.3-317.5	75578- 75692	4.6
ε	CMA	173	I	2012-292	26	255.1-314.3	146081- 75578	138.6
γ	COL	173	E	2012-292	30.9	89.9- 65.9	85568-145359	82.7
ε	CMA	174	E	2012-316	26	314.4-317.8	75742- 75881	5.1
ε	CMA	174	I	2012-316	26	255.1-314.4	146484- 75742	139.1
α	LYR	175	I	2012-324	-35.2	231.1-239.4	142814- 70853	388.2
δ	CEN	183	E	2013-069	55.6	164.7-142.7	69236-146451	160.2
κ	VEL	183	E	2013-069	55.6	70.0- 74.5	68608-126626	99.3
δ	CEN	185	E	2013-093	55.6	165.8-143.2	68247-144162	158.2
β	LIB	187	E	2013-114	15.8	263.4-233.2	125891-145617	79.4
β	LIB	187	I	2013-114	15.8	292.8-263.4	144440-125891	76.8
λ	TAU	188	E	2013-121	-18.6	260.6-237.3	134010-145757	29.3
λ	TAU	188	I	2013-121	-18.6	283.5-260.6	145398-134010	28.9
θ	CAR	190	I	2013-141	67	260.0-235.6	145557- 72291	148.2
δ	CEN	191	E	2013-153	55.6	146.4-134.9	65007-144575	170.8
δ	CEN	194	I	2013-189	55.6	297.0-290.8	145920- 87614	124.7


ALP VIR Rev 124 Egress
HSP Counts (per second)
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)


ALP VIR Rev 124 Egress
Radial Resolution (m)
12.10
12.05
12.00
11.95
11.90
11.85
11.80
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
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)
124.5
124.0
123.5
123.0
122.5
122.0
121.5
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

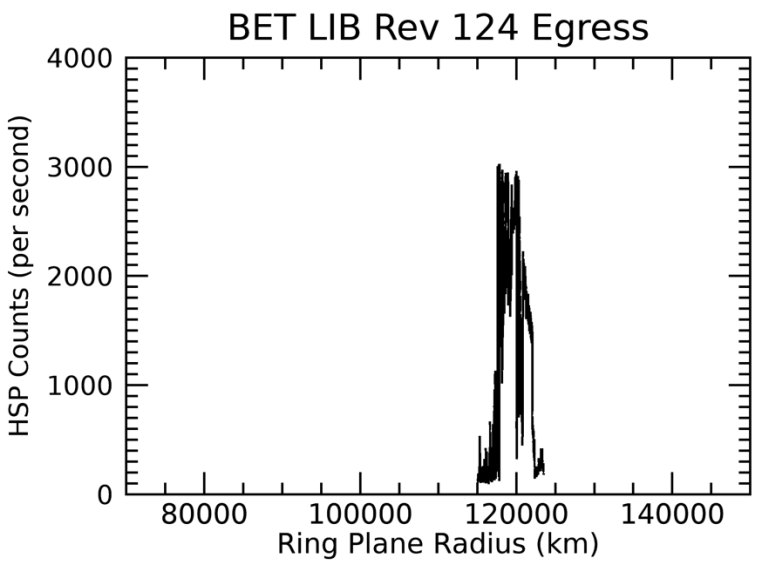


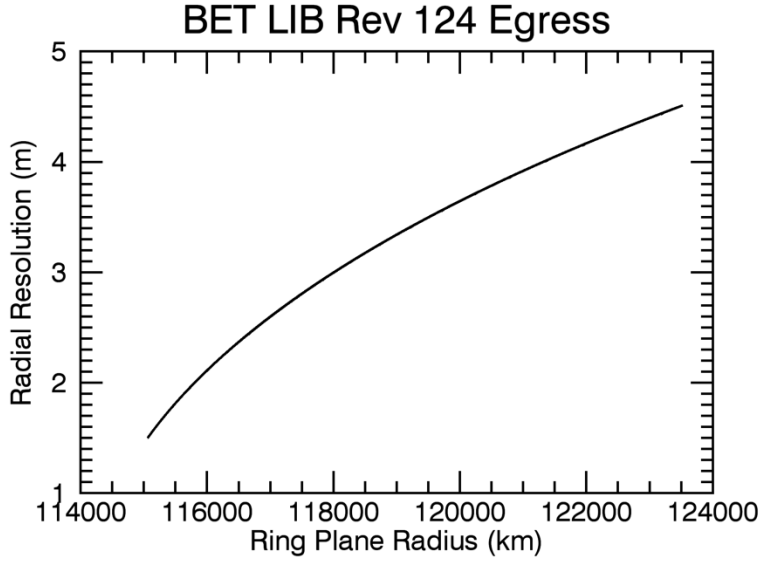
2010−011T12:49:00.000 432686.28 km

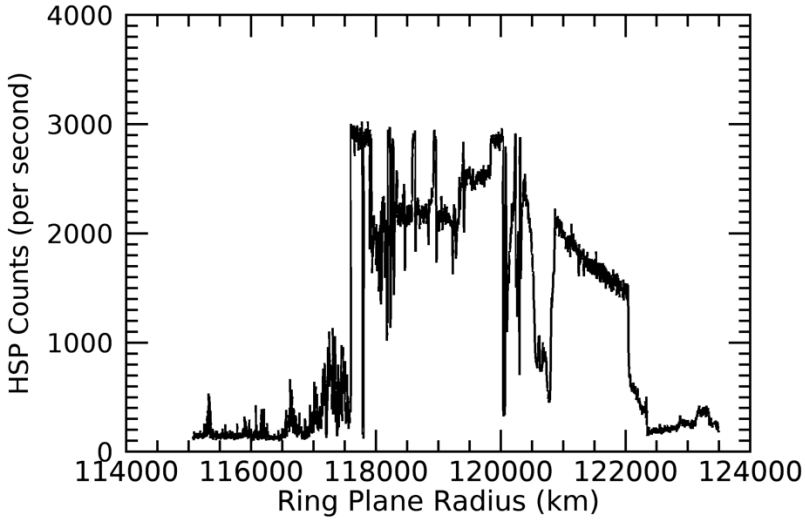
Target RA/dec: 213.14, −8.19

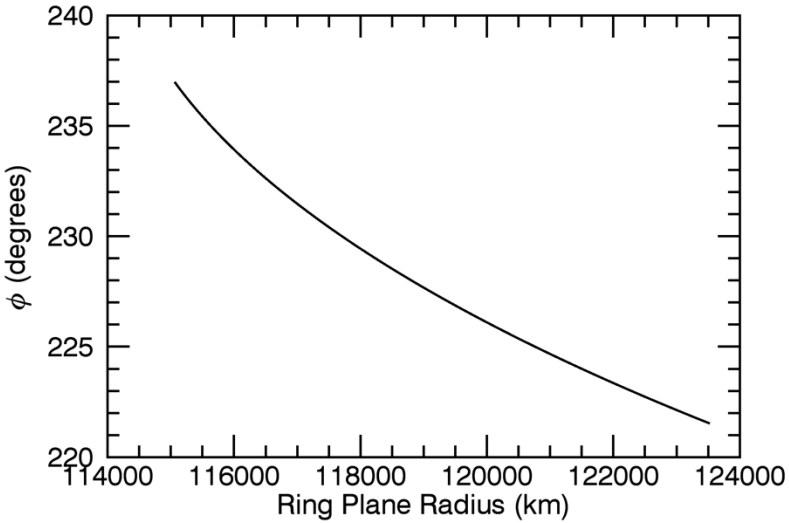
Subsolar lat/lon: 1.91, −135.94

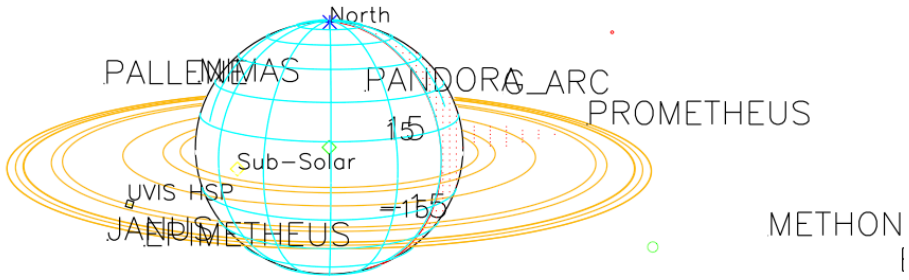
Sub−s/c lat/lon: 12.27, −102.77


BET LIB Rev 124 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
1000
2000
3000
4000
80000
100000
120000
140000


BET LIB Rev 124 Egress
Radial Resolution (m)
Ring Plane Radius (km)
1
2
3
4
5
114000
116000
118000
120000
122000
124000


HSP Counts (per second)
Ring Plane Radius (km)
0
1000
2000
3000
4000
114000
116000
118000
120000
122000
124000


ϕ (degrees)
Ring Plane Radius (km)
220
225
230
235
240
114000
116000
118000
120000
122000
124000

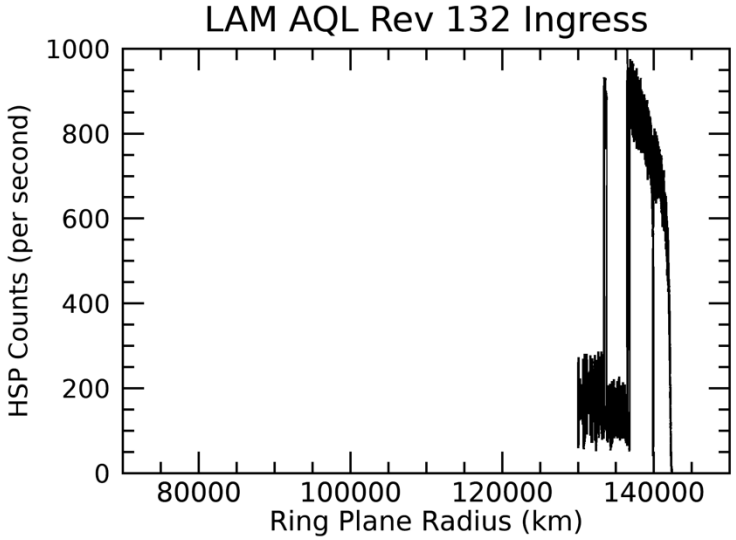


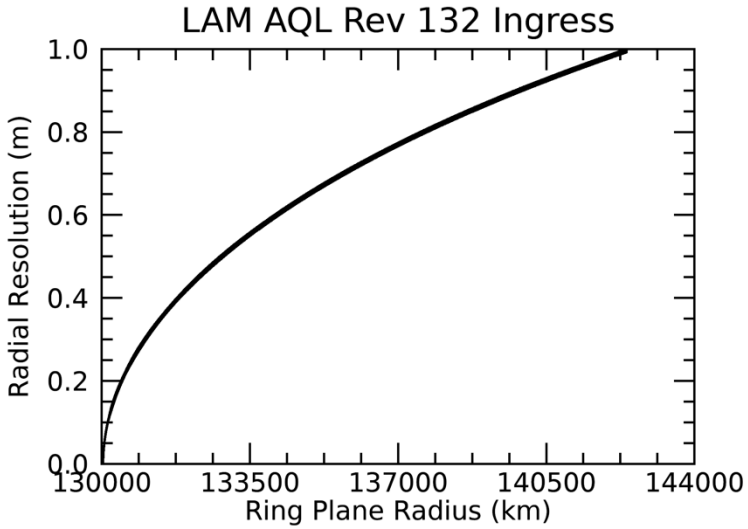
2010-011T14:24:00.000 481715.60 km

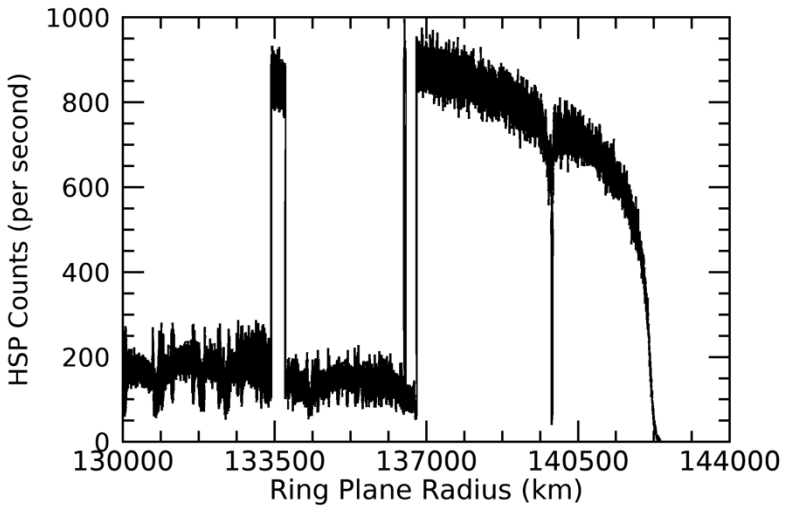
Target RA/dec: 218.53, -6.54

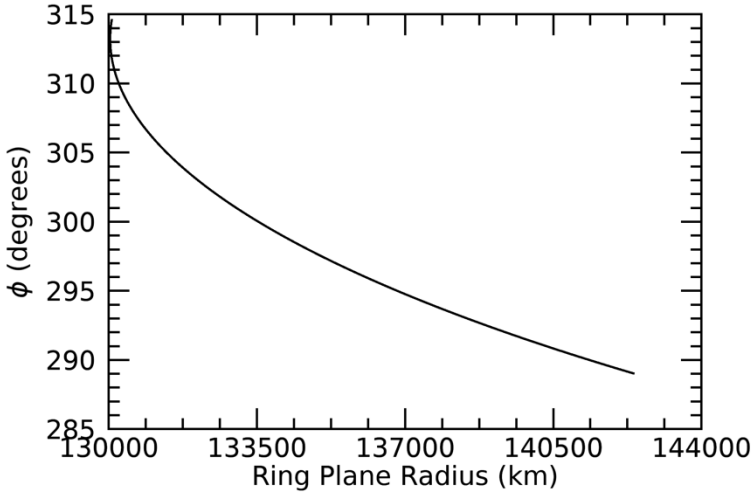
Subsolar lat/lon: 1.91, 170.57

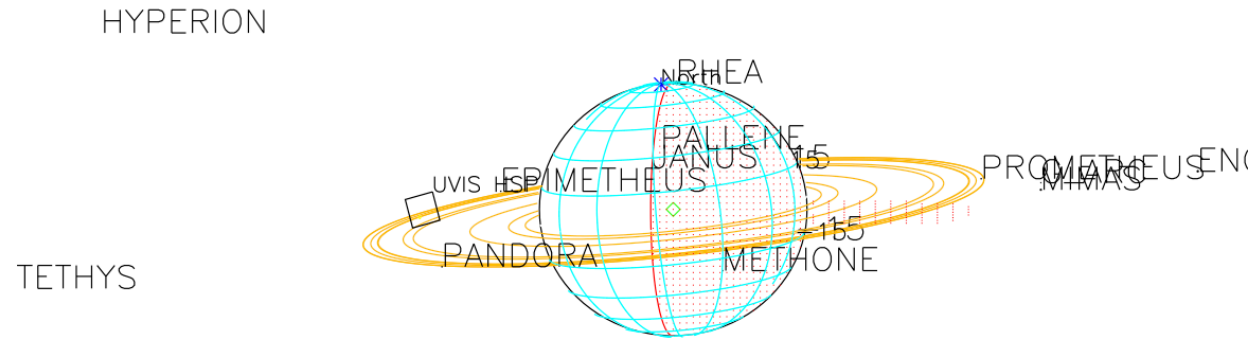
Sub-s/c lat/lon: 10.89, -150.74


LAM AQL Rev 132 Ingress
HSP Counts (per second)
Ring Plane Radius (km)
0
200
400
600
800
1000
80000
100000
120000
140000


LAM AQL Rev 132 Ingress
Radial Resolution (m)
Ring Plane Radius (km)
0.0
0.2
0.4
0.6
0.8
1.0
130000
133500
137000
140500
144000


HSP Counts (per second)
Ring Plane Radius (km)
0
200
400
600
800
1000
130000
133500
137000
140500
144000


ϕ (degrees)
Ring Plane Radius (km)
285
290
295
300
305
310
315
130000
133500
137000
140500
144000

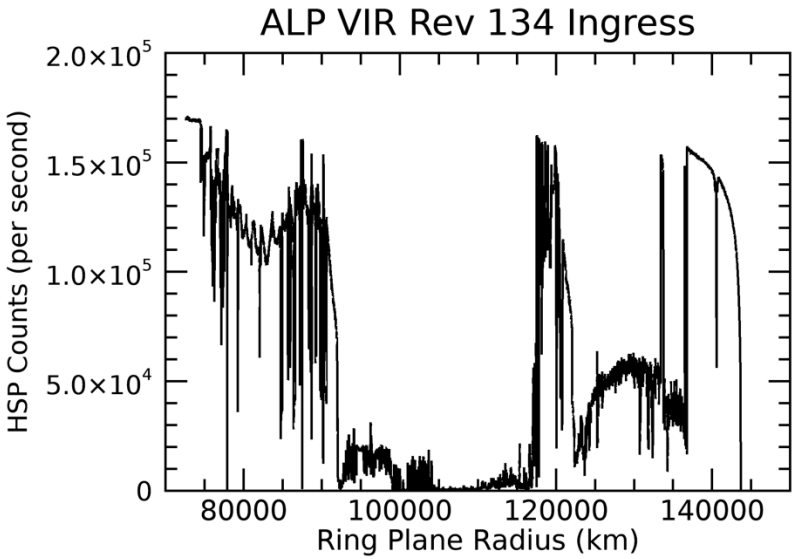


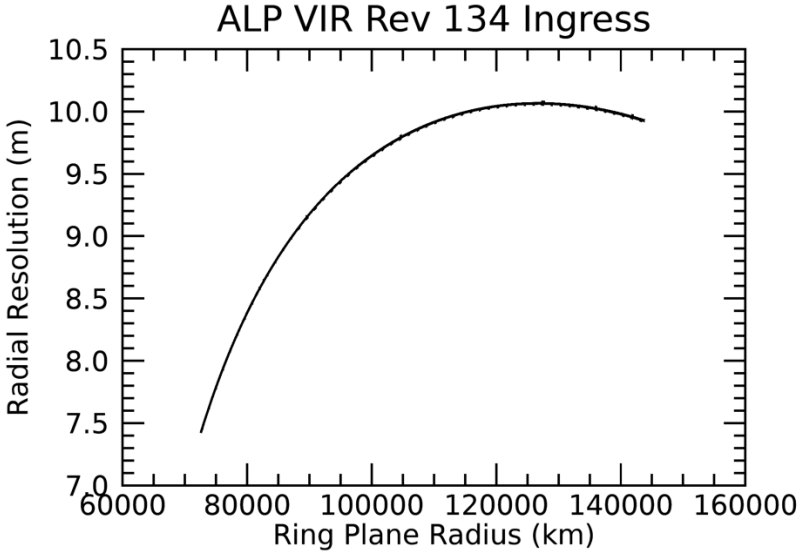
2010-148T23:31:00.000 2111691.6 km

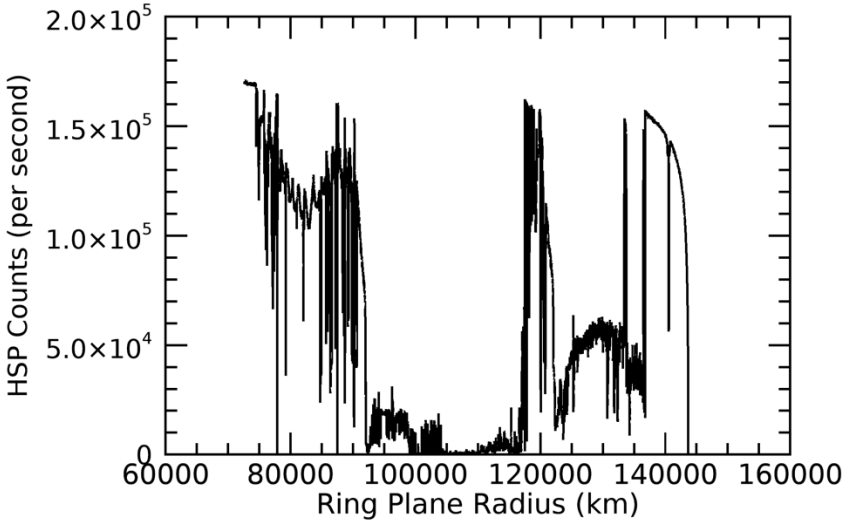
Target RA/dec: 283.45, -4.80

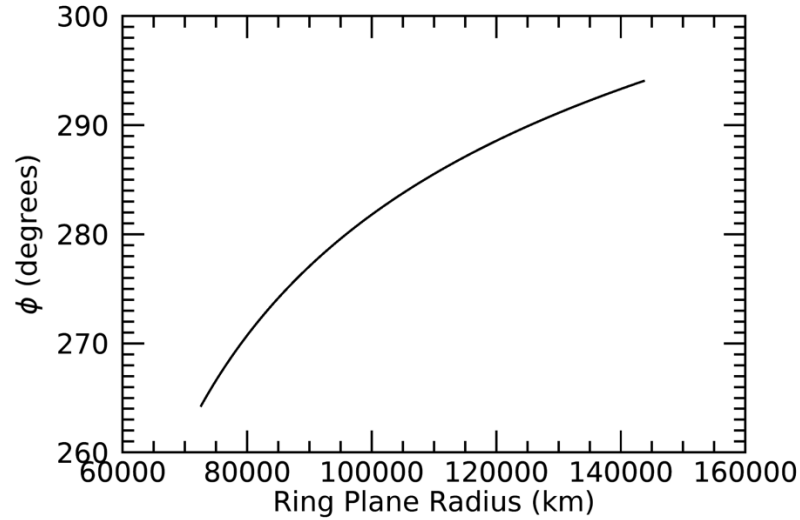
Subsolar lat/lon: 3.59, 28.01

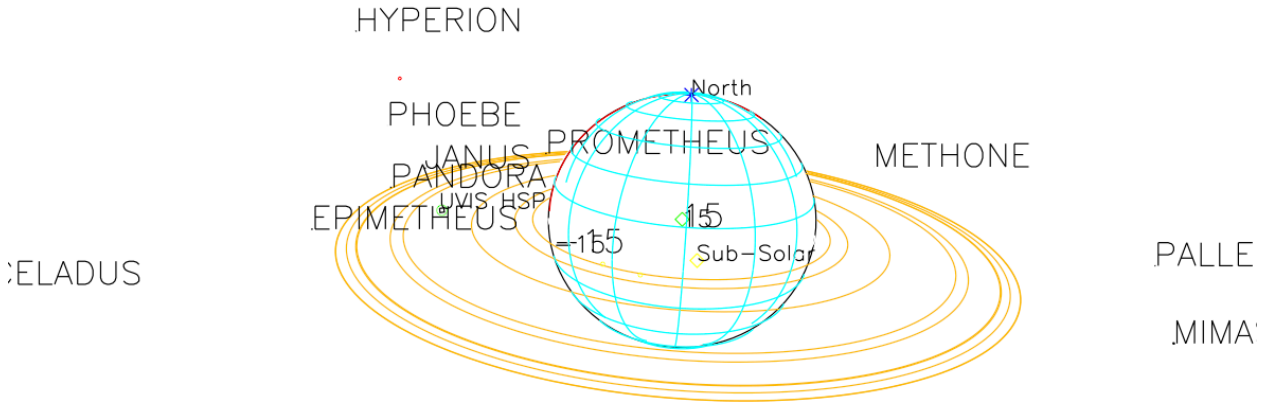
Sub-s/c lat/lon: 6.32, 128.16


ALP VIR Rev 134 Ingress
HSP Counts (per second)
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)


ALP VIR Rev 134 Ingress
Radial Resolution (m)
10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
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)
300
290
280
270
260
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

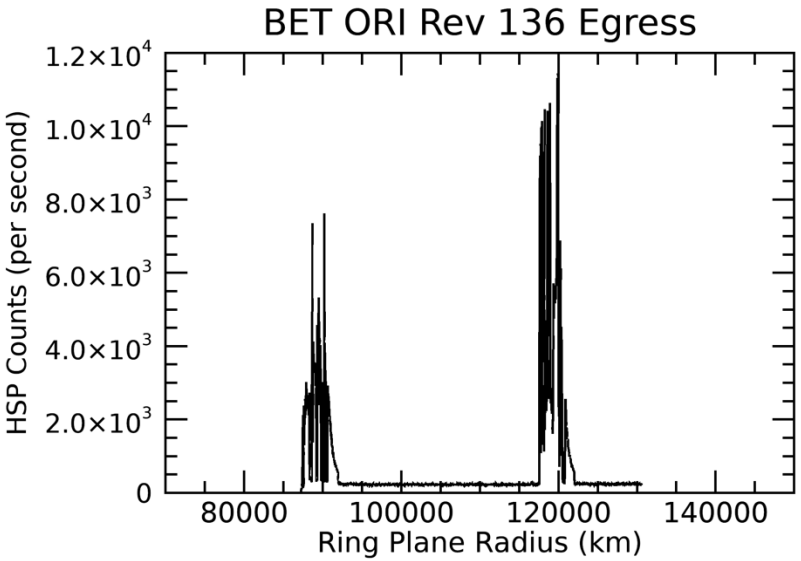


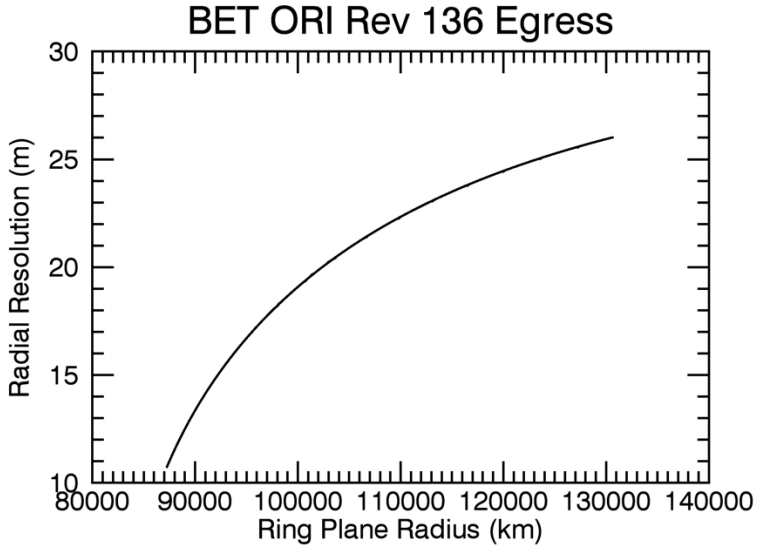
2010-186T10:02:00.000 289485.60 km

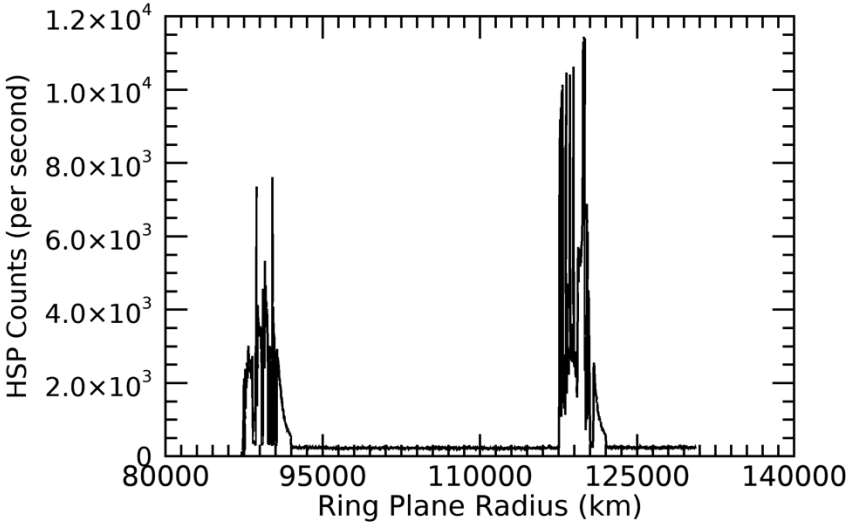
Target RA/dec: 179.97, -12.75

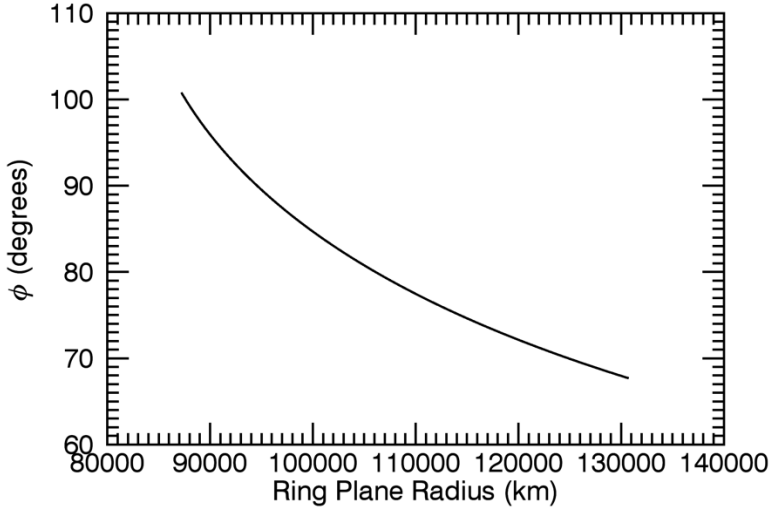
Subsolar lat/lon: 4.04, -85.58

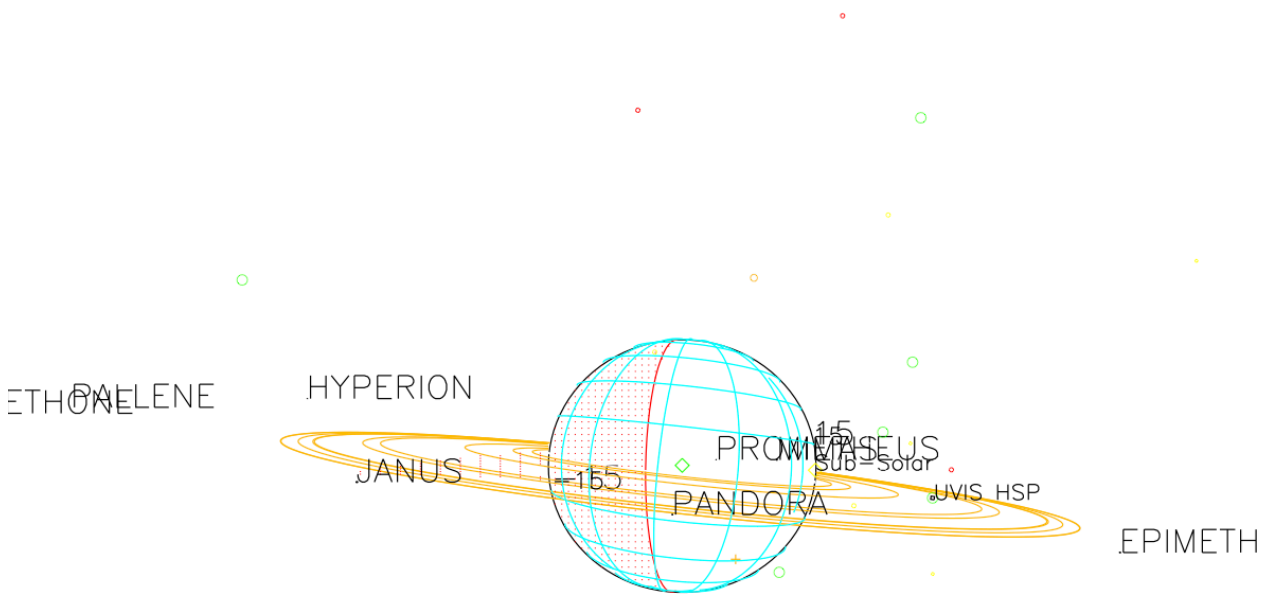
Sub-s/c lat/lon: 15.05, -91.84


BET ORI Rev 136 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)


BET ORI Rev 136 Egress
Radial Resolution (m)
30
25
20
15
10
80000
90000
100000
110000
120000
130000
140000
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
80000
95000
110000
125000
140000
Ring Plane Radius (km)


ϕ (degrees)
110
100
90
80
70
60
80000
90000
100000
110000
120000
130000
140000
Ring Plane Radius (km)

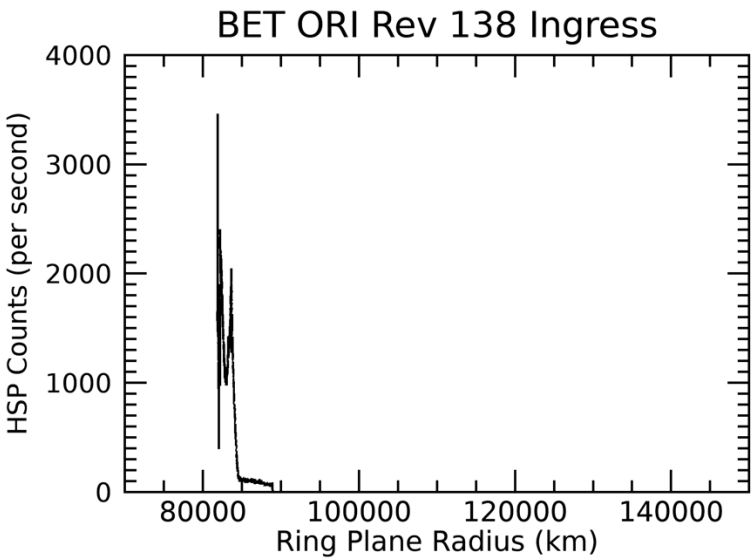


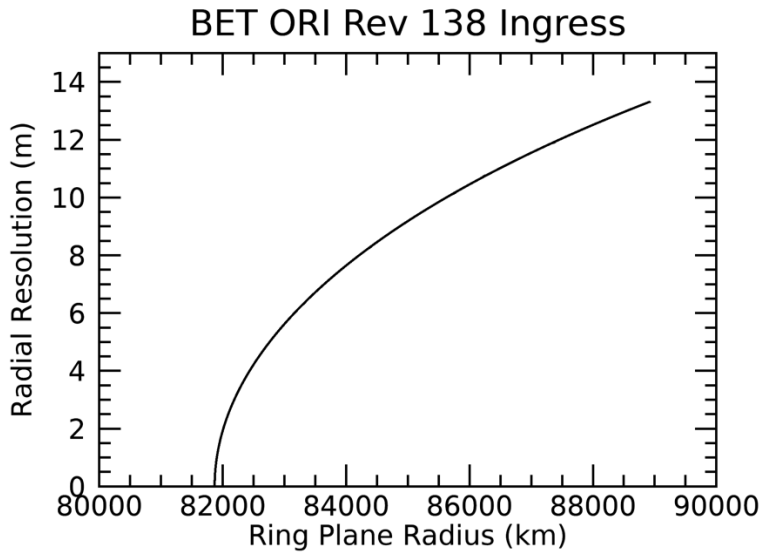
2010-226T01:21:00.000 208947.68 km

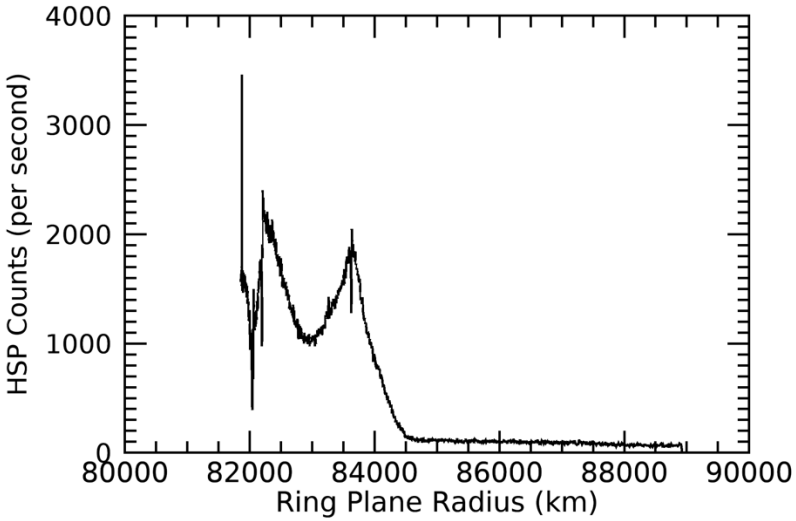
Target RA/dec: 108.31, -5.40

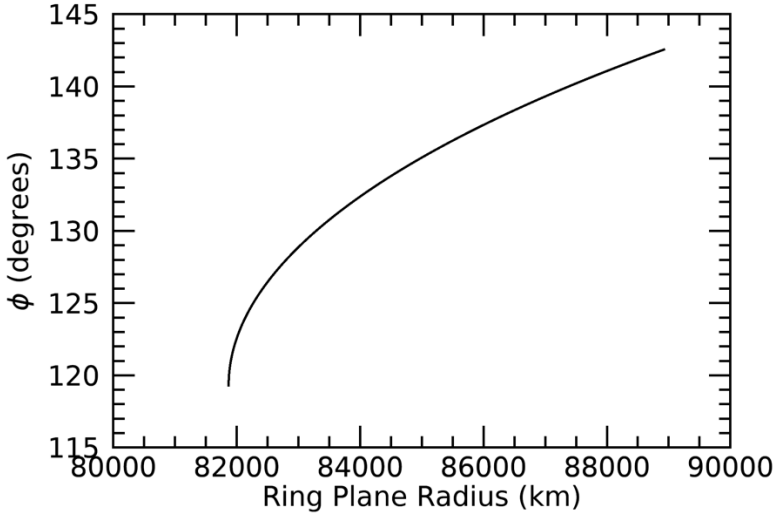
Subsolar lat/lon: 4.52, 177.20

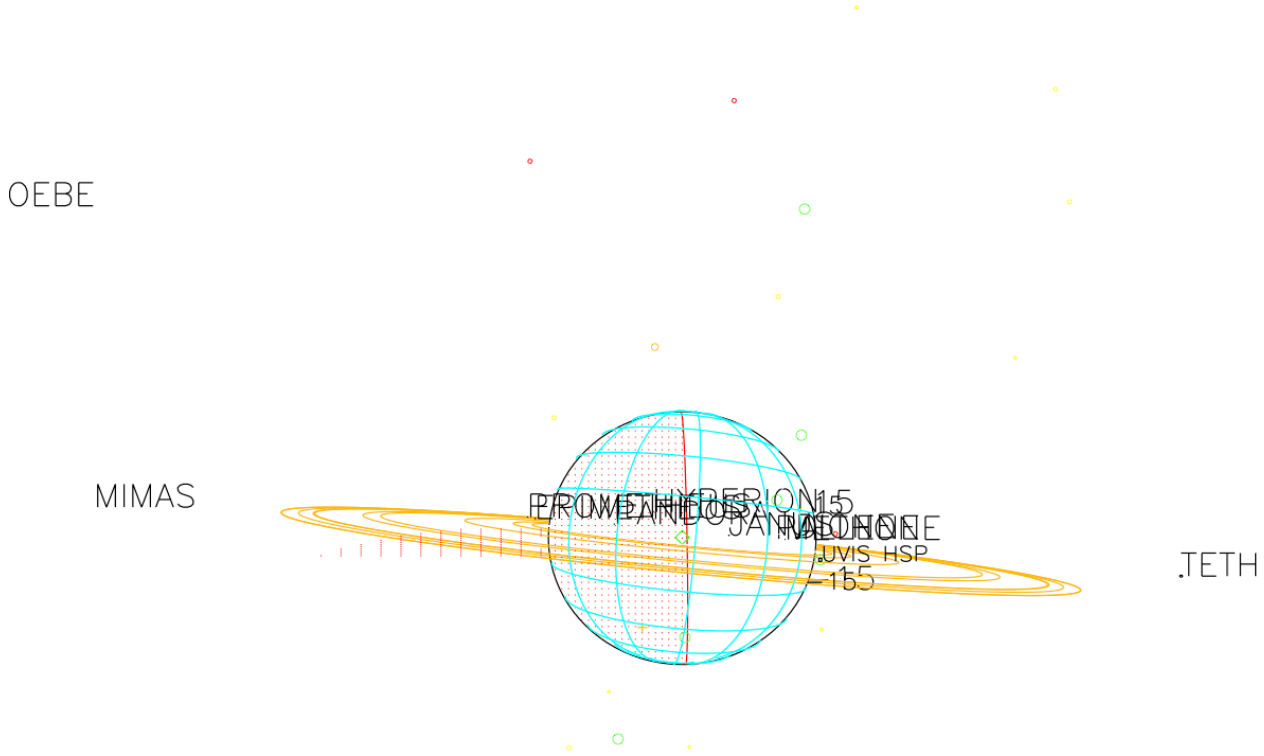
Sub-s/c lat/lon: 2.52, 98.81


BET ORI Rev 138 Ingress
HSP Counts (per second)
Ring Plane Radius (km)
0
1000
2000
3000
4000
80000
100000
120000
140000


BET ORI Rev 138 Ingress
Radial Resolution (m)
Ring Plane Radius (km)
0
2
4
6
8
10
12
14
80000
82000
84000
86000
88000
90000


HSP Counts (per second)
Ring Plane Radius (km)
0
1000
2000
3000
4000
80000
82000
84000
86000
88000
90000


ϕ (degrees)
Ring Plane Radius (km)
115
120
125
130
135
140
145
80000
82000
84000
86000
88000
90000

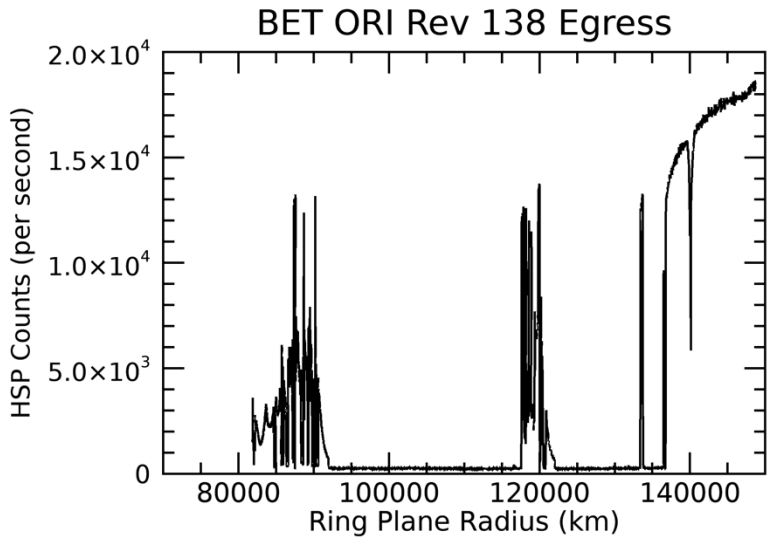


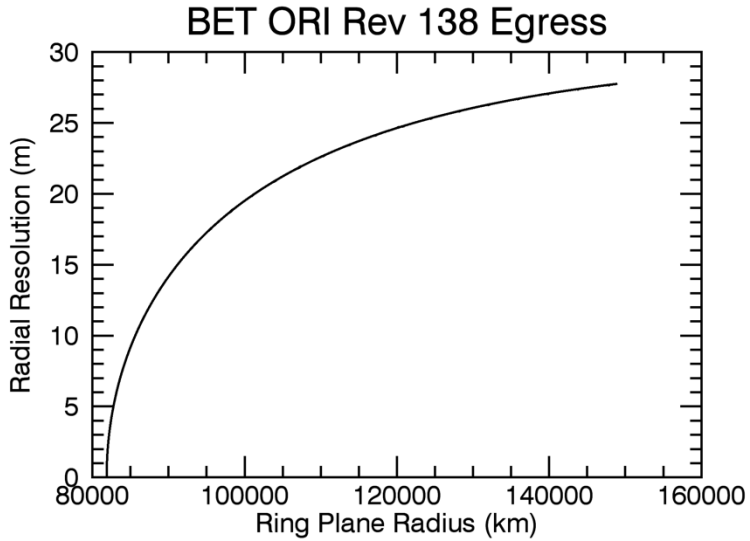
2010-265T23:34:00.000 209308.74 km

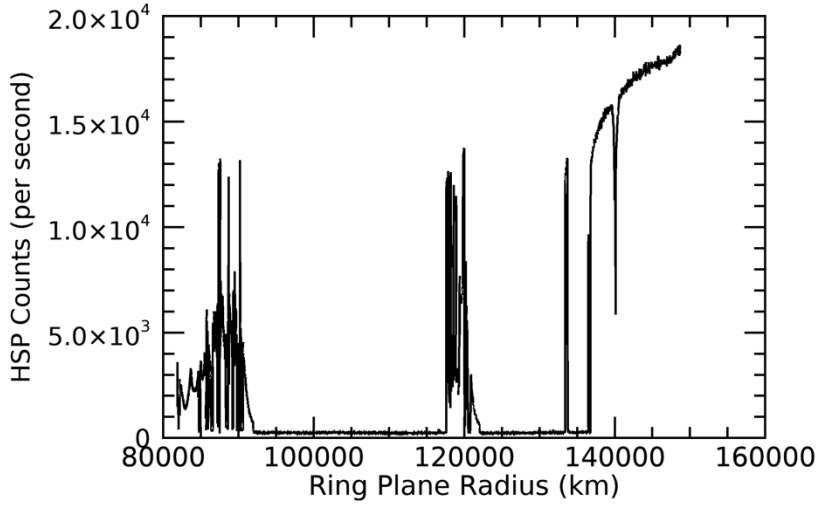
Target RA/dec: 96.04, -5.82

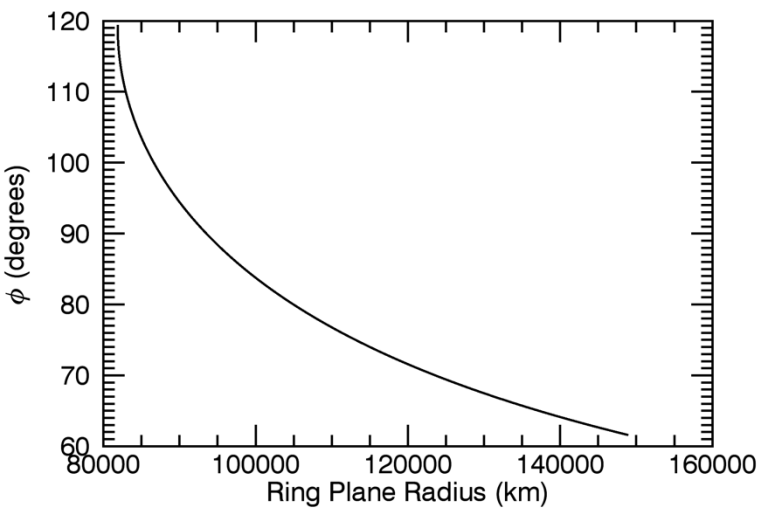
Subsolar lat/lon: 5.00, -153.10

Sub-s/c lat/lon: 1.83, 115.10


BET ORI Rev 138 Egress
HSP Counts (per second)
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)


BET ORI Rev 138 Egress
Radial Resolution (m)
30
25
20
15
10
5
0
80000
100000
120000
140000
160000
Ring Plane Radius (km)


HSP Counts (per second)
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)

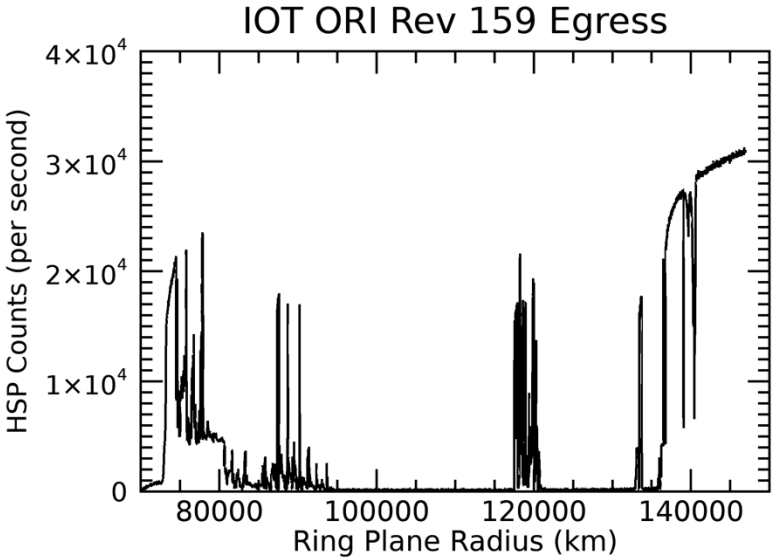

ϕ (degrees)
120
110
100
90
80
70
60
80000
100000
120000
140000
160000
Ring Plane Radius (km)

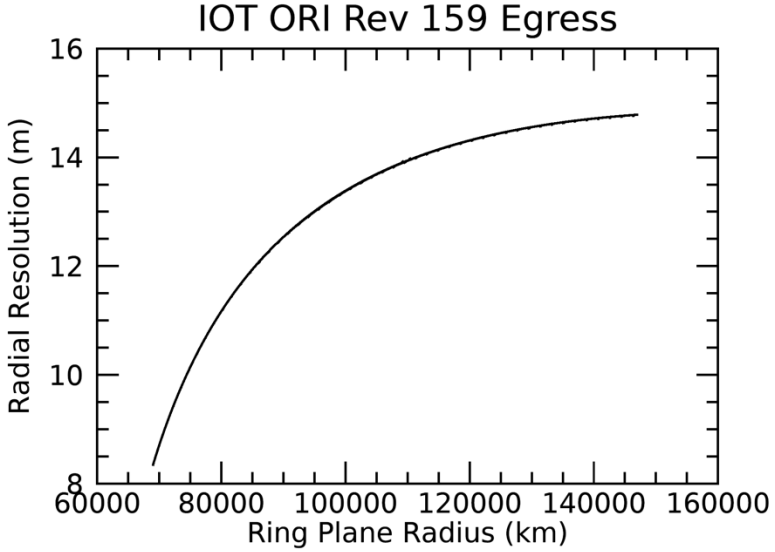
2010-266T00:13:00.000 208742.97 km

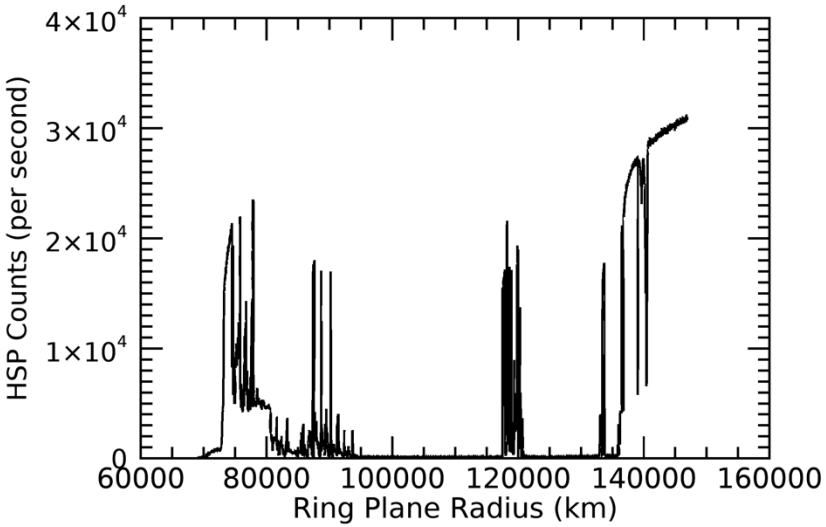
Target RA/dec: 107.88, -5.45

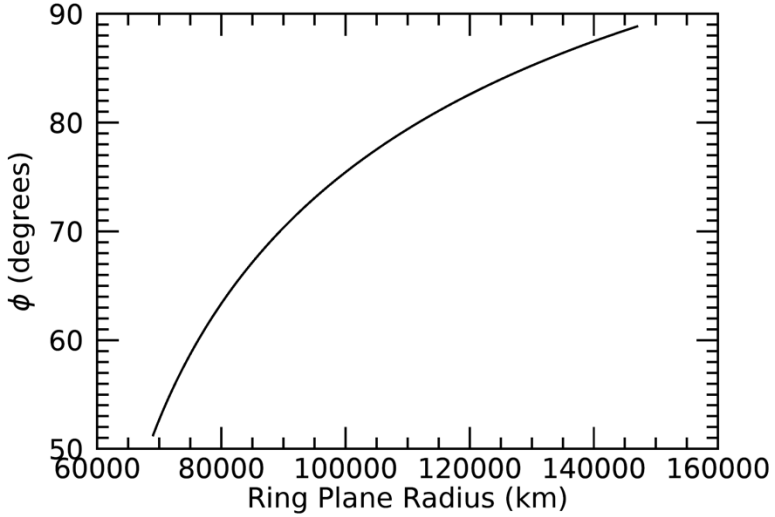
Subsolar lat/lon: 5.00, -175.06

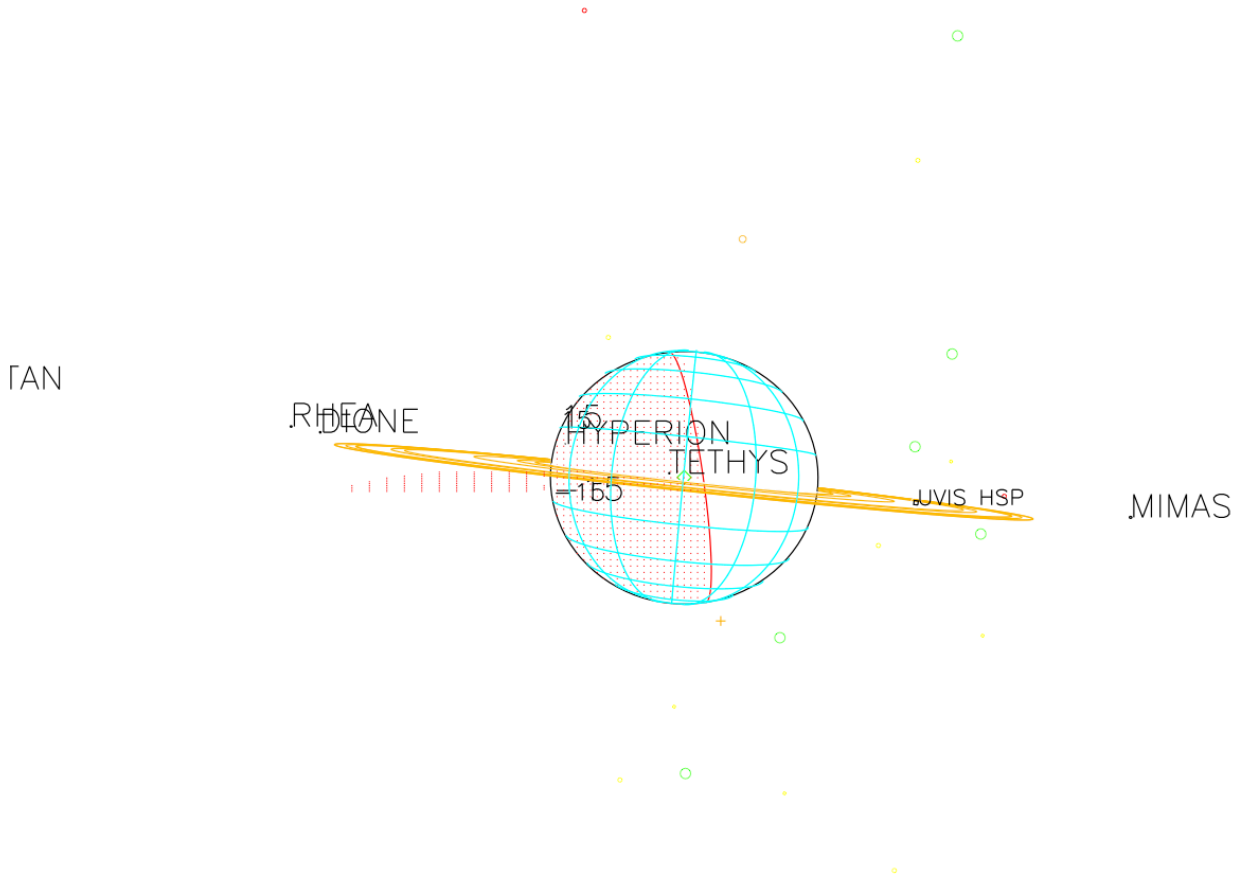
Sub-s/c lat/lon: 2.52, 104.91


IOT ORI Rev 159 Egress
HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)

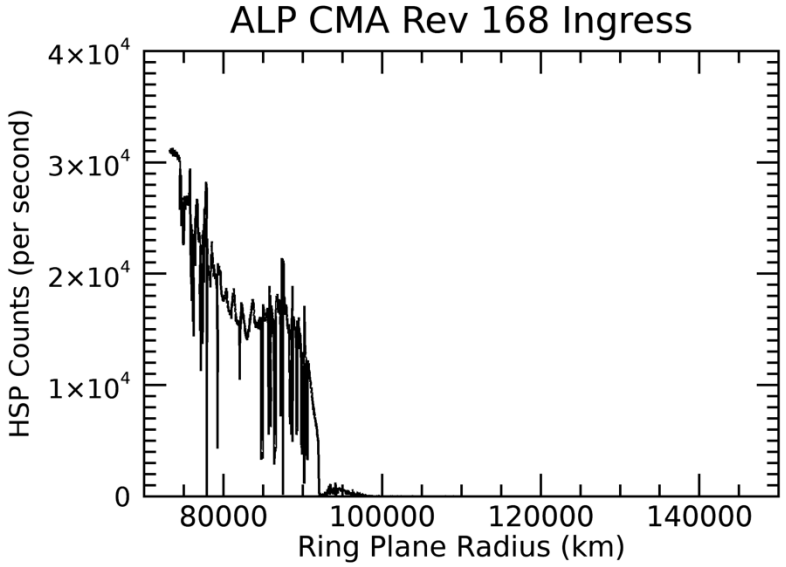

IOT ORI Rev 159 Egress
Radial Resolution (m)
16
14
12
10
8
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

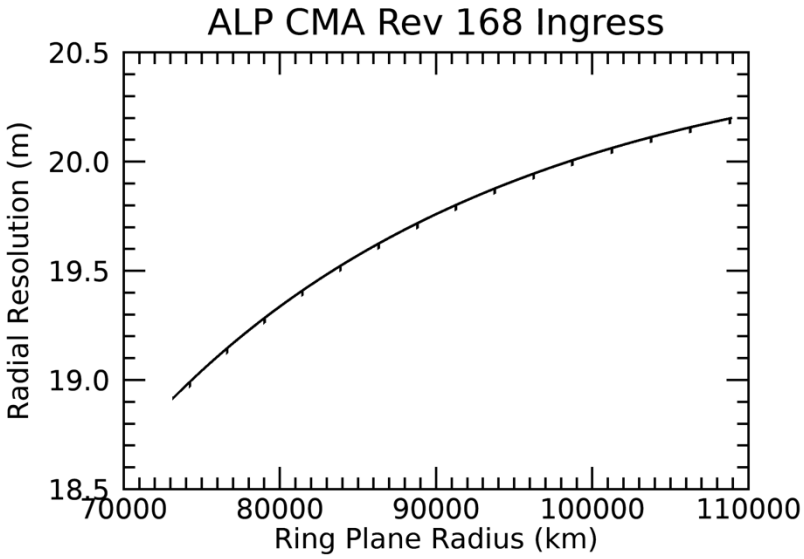

HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

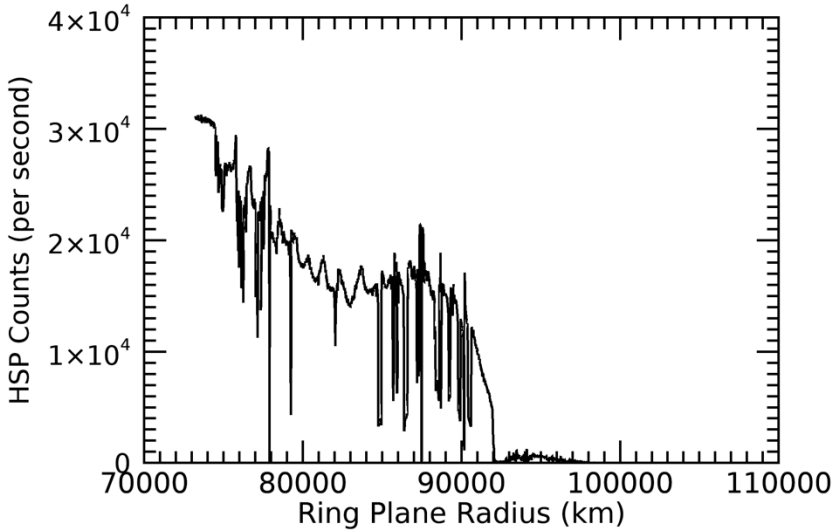

ϕ (degrees)
90
80
70
60
50
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

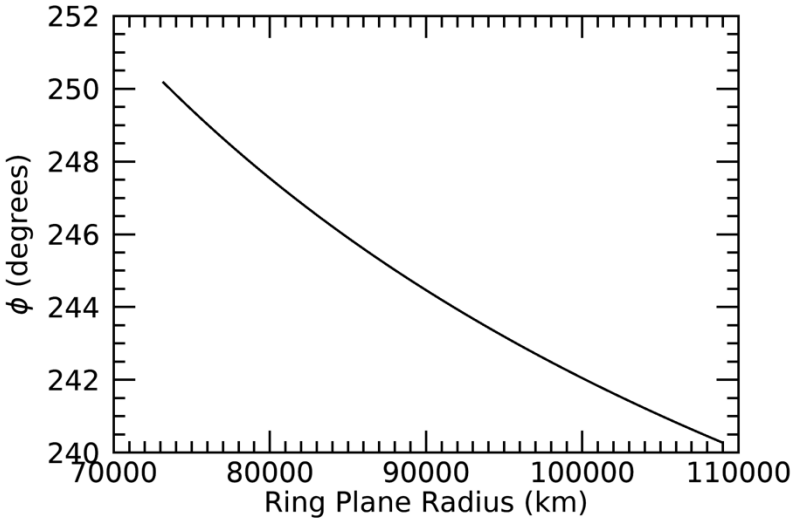


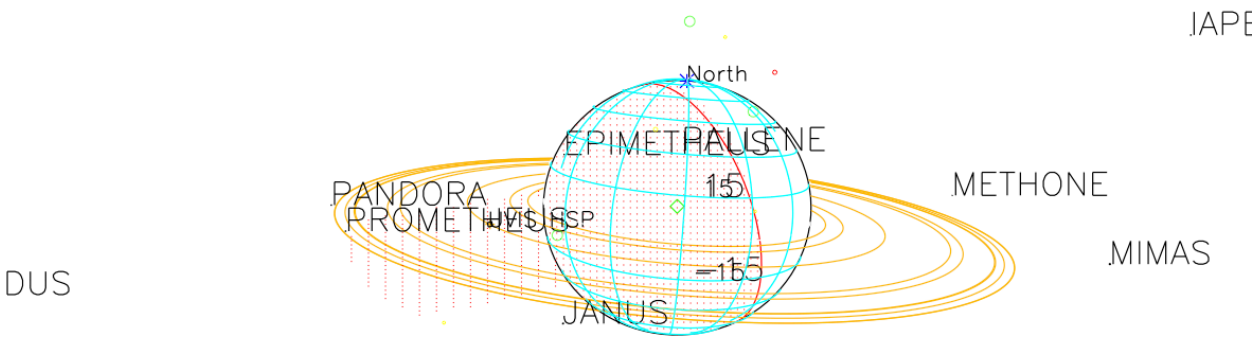
2012−004T15:19:00.000 280983.79 km
Target RA/dec: 104.78, −4.04
Subsolar lat/lon: 10.34, 37.39
Sub−s/c lat/lon: 1.03, −59.68


ALP CMA Rev 168 Ingress
HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP CMA Rev 168 Ingress
Radial Resolution (m)
20.5
20.0
19.5
19.0
18.5
70000
80000
90000
100000
110000
Ring Plane Radius (km)


HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
70000
80000
90000
100000
110000
Ring Plane Radius (km)


ϕ (degrees)
252
250
248
246
244
242
240
70000
80000
90000
100000
110000
Ring Plane Radius (km)

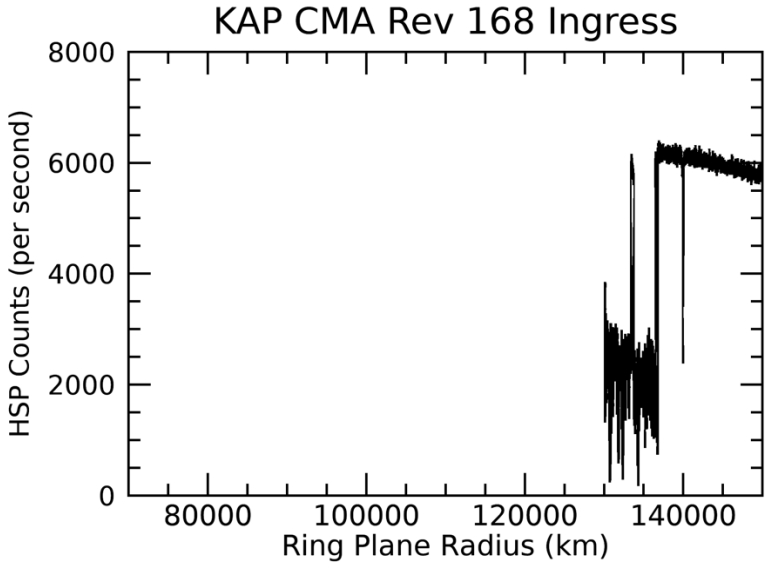


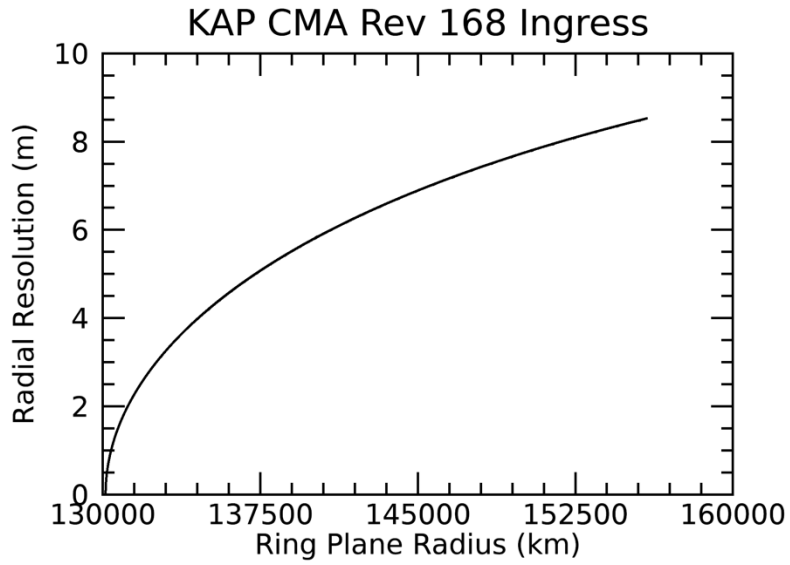
2012−180T23:06:00.000 309581.26 km

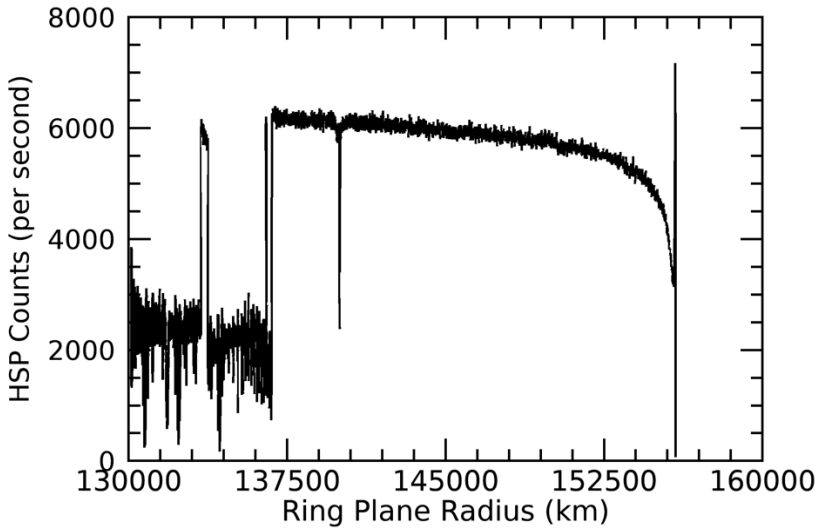
Target RA/dec: 85.08, −15.90

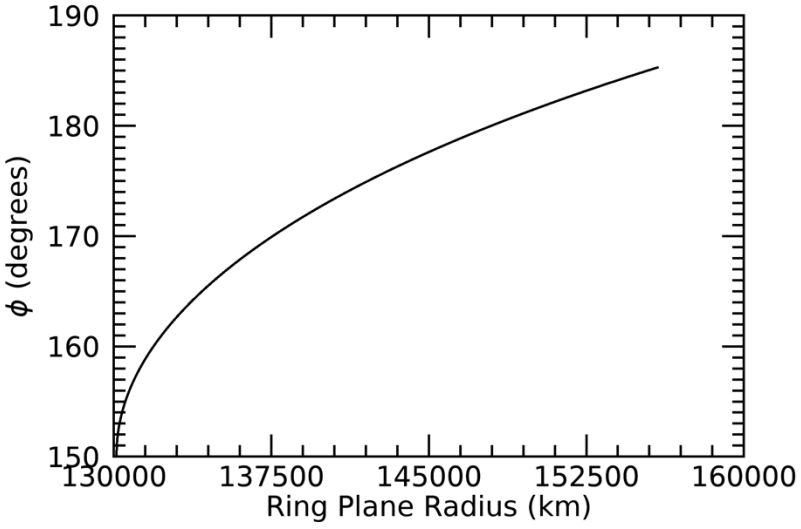
Subsolar lat/lon: 12.19, 0.08

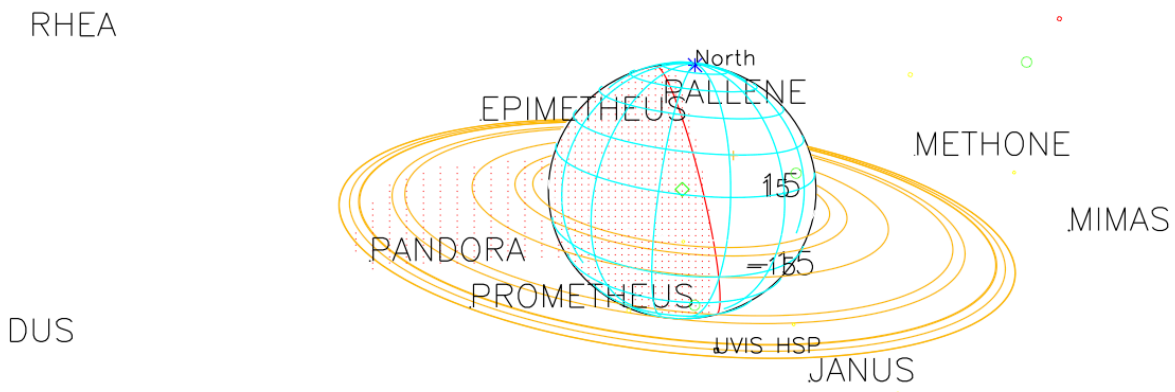
Sub−s/c lat/lon: 9.53, −122.87


KAP CMA Rev 168 Ingress
HSP Counts (per second)
Ring Plane Radius (km)
0
2000
4000
6000
8000
80000
100000
120000
140000


KAP CMA Rev 168 Ingress
Radial Resolution (m)
Ring Plane Radius (km)
0
2
4
6
8
10
130000
137500
145000
152500
160000


HSP Counts (per second)
Ring Plane Radius (km)
0
2000
4000
6000
8000
130000
137500
145000
152500
160000


ϕ (degrees)
Ring Plane Radius (km)
150
160
170
180
190
130000
137500
145000
152500
160000

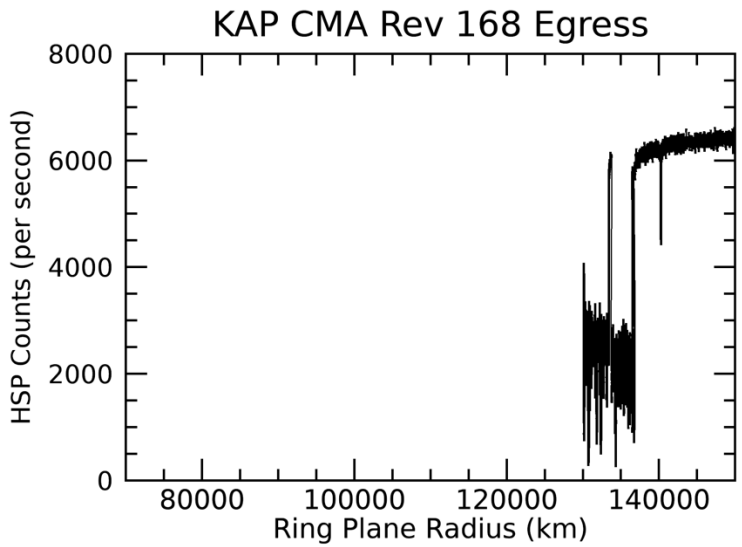


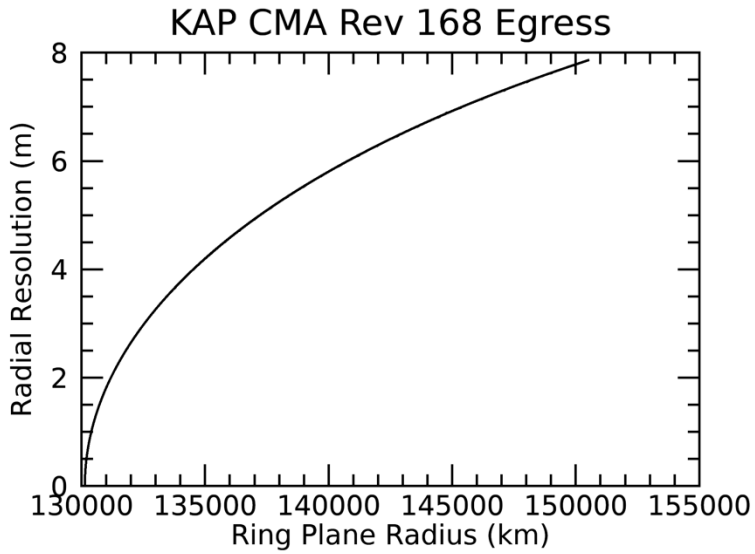
2012−181T01:06:00.000 306372.65 km

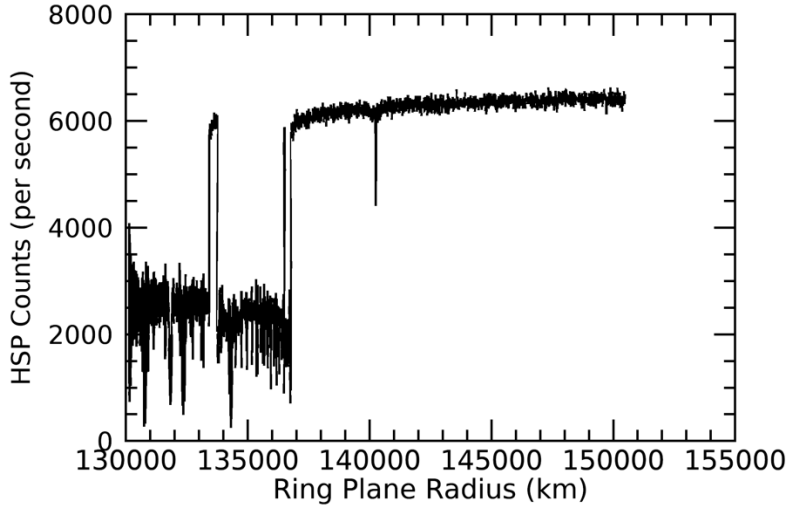
Target RA/dec: 105.85, −19.55

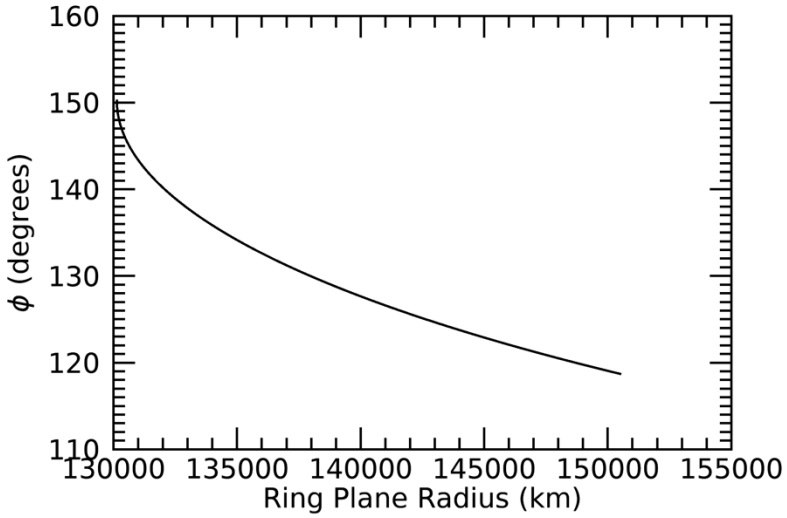
Subsolar lat/lon: 12.19, −67.48

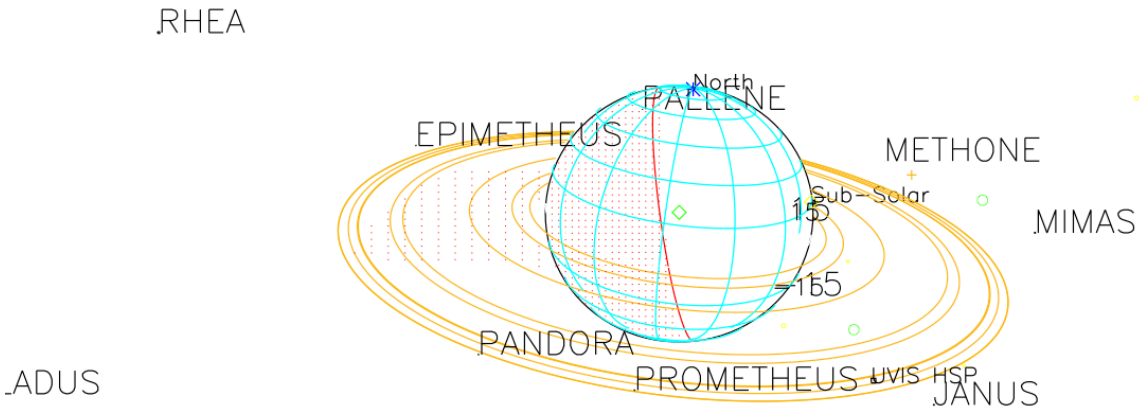
Sub−s/c lat/lon: 14.26, −170.49


KAP CMA Rev 168 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
2000
4000
6000
8000
80000
100000
120000
140000


KAP CMA Rev 168 Egress
Radial Resolution (m)
Ring Plane Radius (km)
0
2
4
6
8
130000
135000
140000
145000
150000
155000


HSP Counts (per second)
Ring Plane Radius (km)
0
2000
4000
6000
8000
130000
135000
140000
145000
150000
155000


ϕ (degrees)
Ring Plane Radius (km)
110
120
130
140
150
160
130000
135000
140000
145000
150000
155000

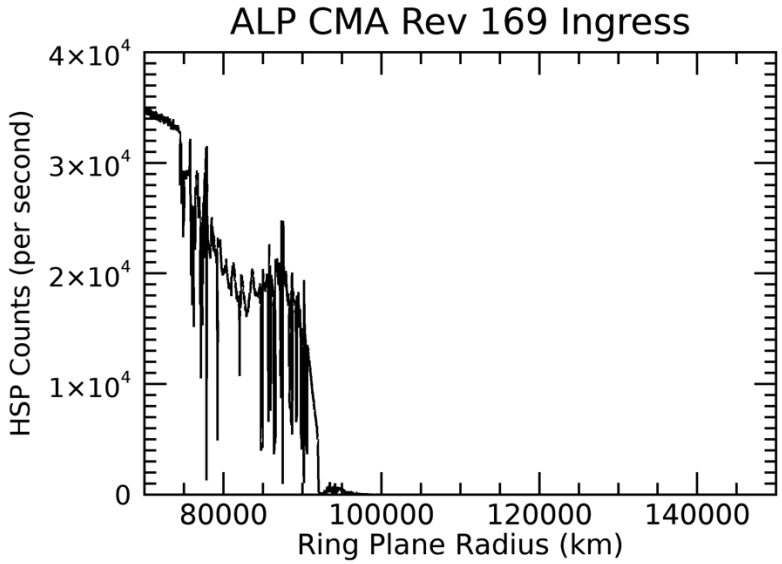


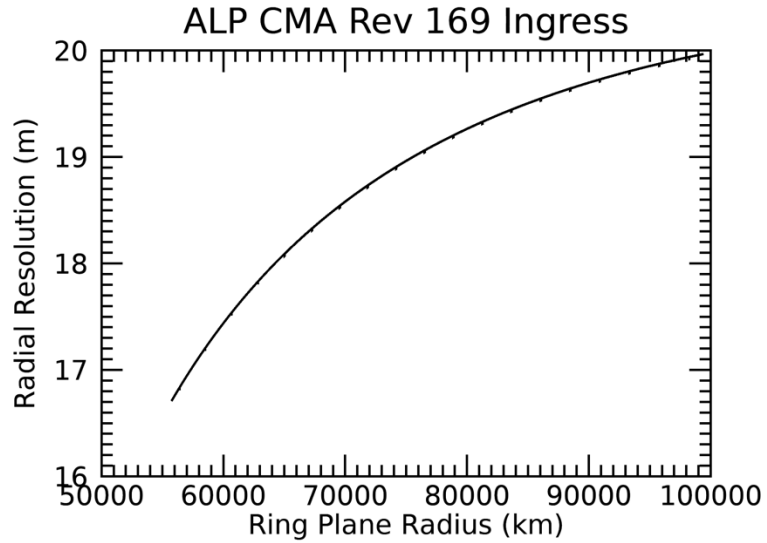
2012-181T02:32:00.000 314349.03 km

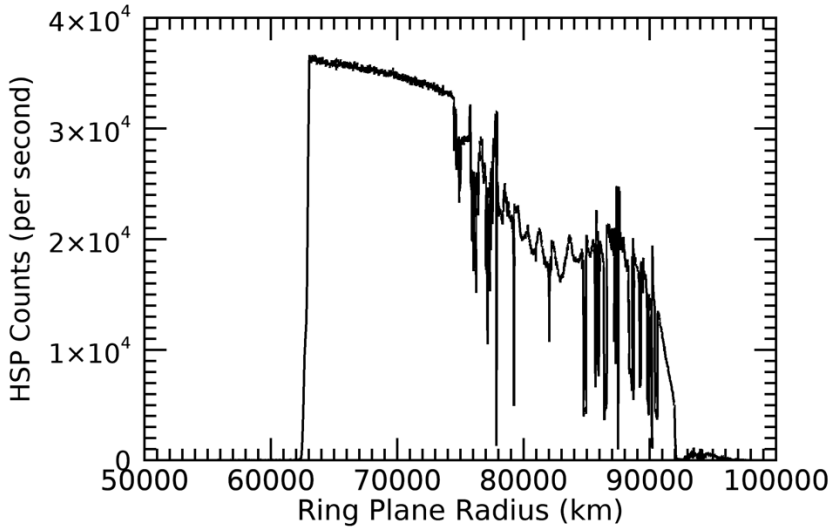
Target RA/dec: 120.85, -20.67

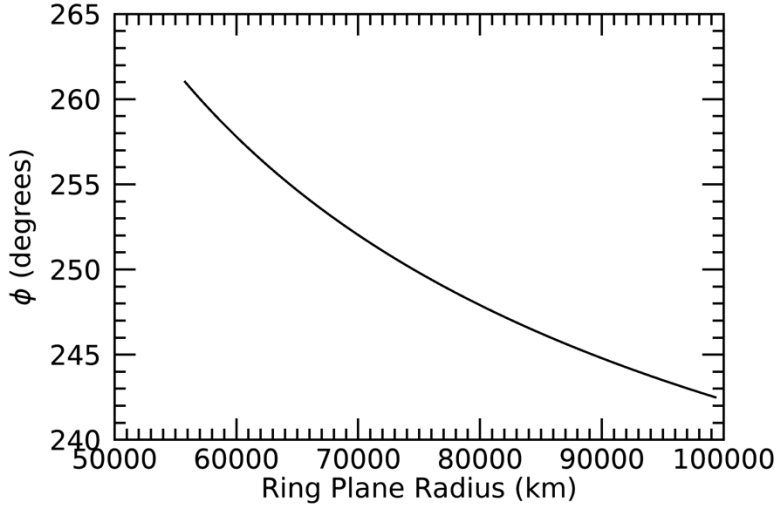
Subsolar lat/lon: 12.19, -115.90

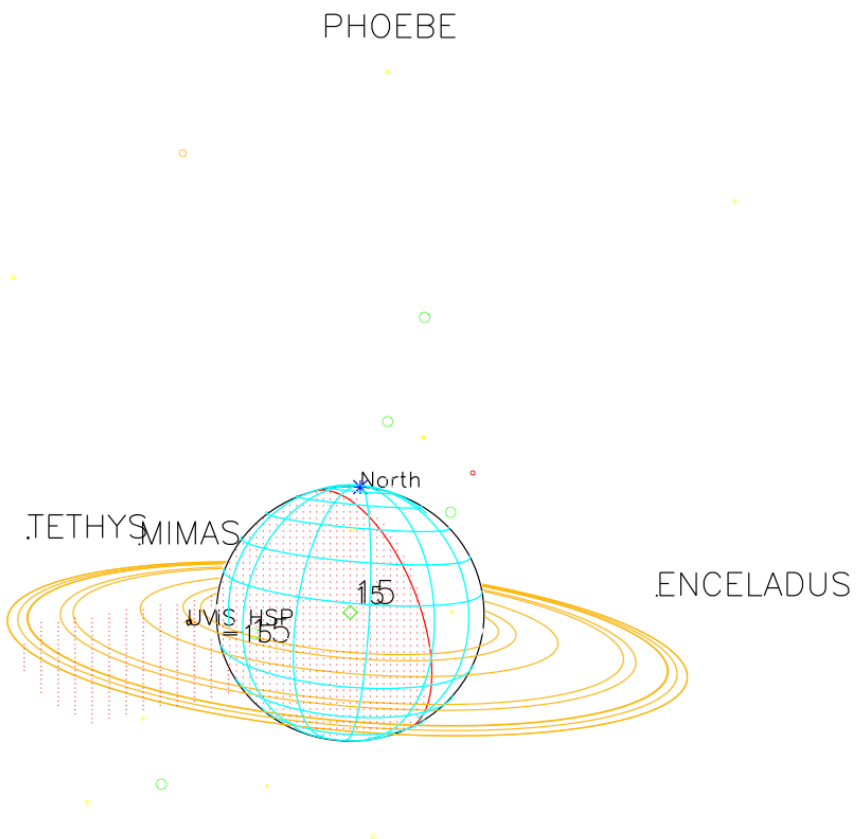
Sub-s/c lat/lon: 16.59, 155.68


ALP CMA Rev 169 Ingress
HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP CMA Rev 169 Ingress
Radial Resolution (m)
20
19
18
17
16
50000
60000
70000
80000
90000
100000
Ring Plane Radius (km)


HSP Counts (per second)
4×10^4
3×10^4
2×10^4
1×10^4
0
50000
60000
70000
80000
90000
100000
Ring Plane Radius (km)


ϕ (degrees)
265
260
255
250
245
240
50000
60000
70000
80000
90000
100000
Ring Plane Radius (km)

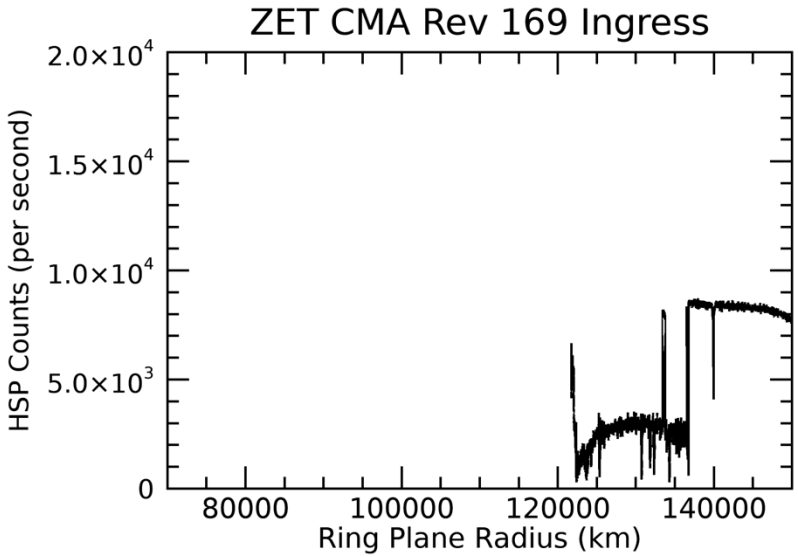


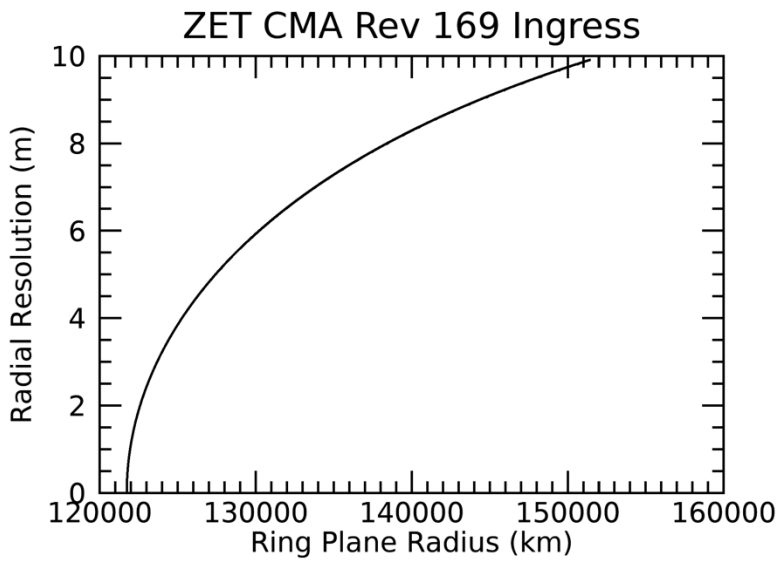
2012-204T21:51:00.000 308497.80 km

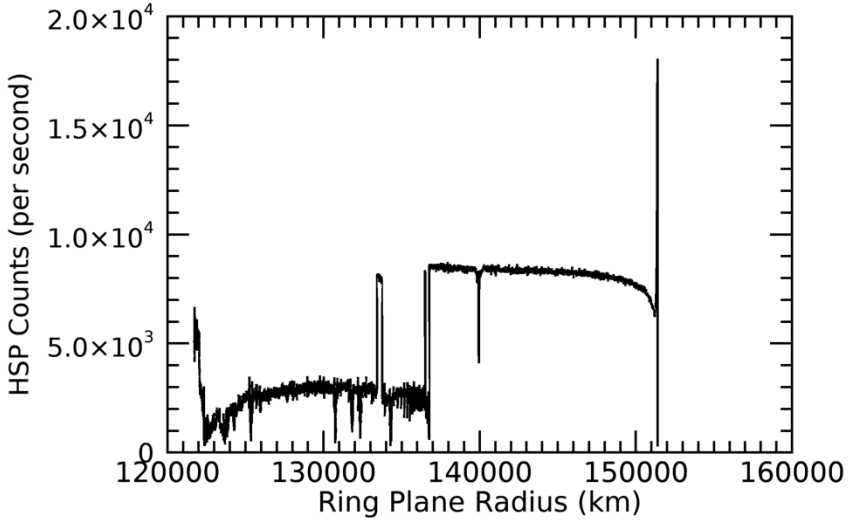
Target RA/dec: 87.14, -16.40

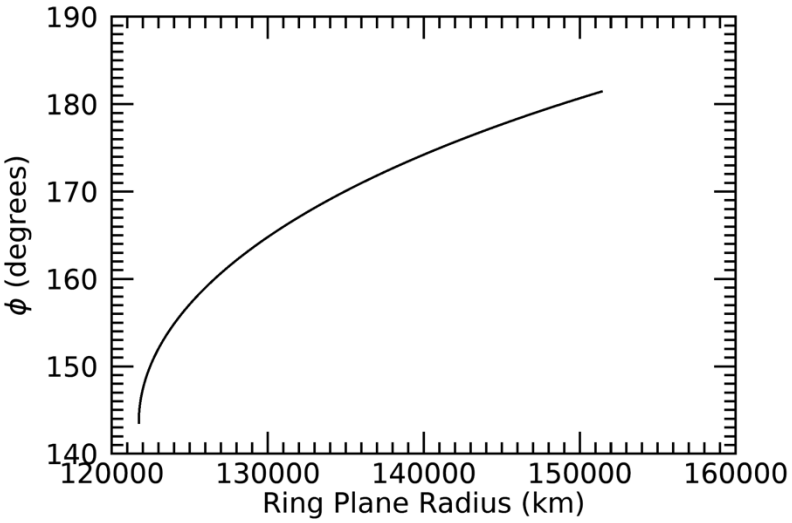
Subsolar lat/lon: 12.43, 23.98

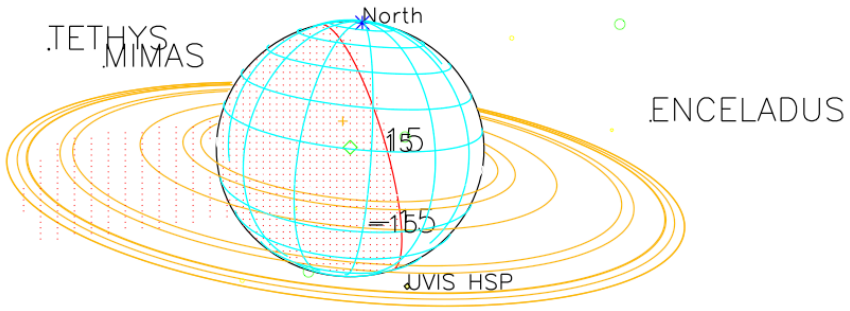
Sub-s/c lat/lon: 10.09, -97.73


ZET CMA Rev 169 Ingress
HSP Counts (per second)
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)


ZET CMA Rev 169 Ingress
Radial Resolution (m)
10
8
6
4
2
0
120000
130000
140000
150000
160000
Ring Plane Radius (km)


HSP Counts (per second)
2.0×10^4
1.5×10^4
1.0×10^4
5.0×10^3
0
120000
130000
140000
150000
160000
Ring Plane Radius (km)


ϕ (degrees)
190
180
170
160
150
140
120000
130000
140000
150000
160000
Ring Plane Radius (km)

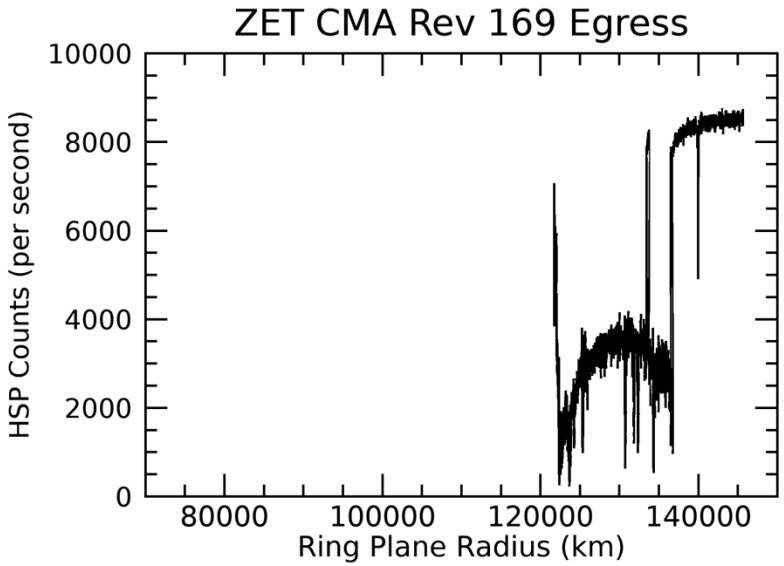


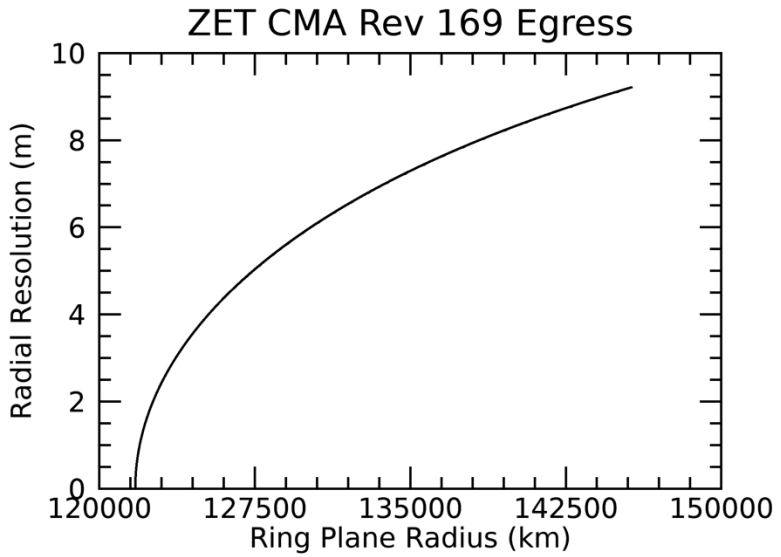
2012−204T23:09:00.000 305539.40 km

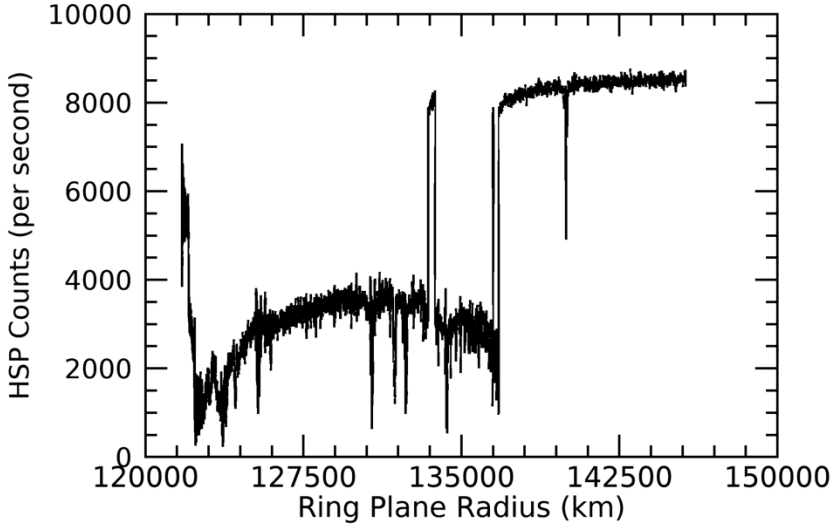
Target RA/dec: 100.62, −18.87

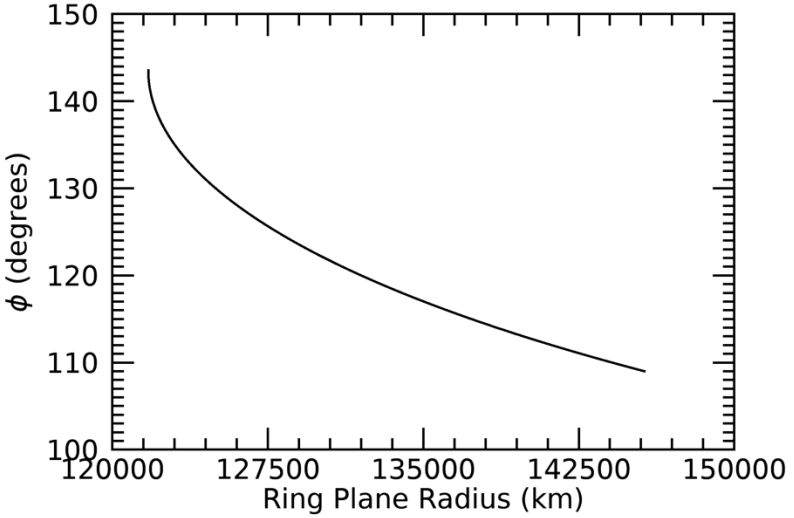
Subsolar lat/lon: 12.43, −19.93

Sub−s/c lat/lon: 13.24, −128.72

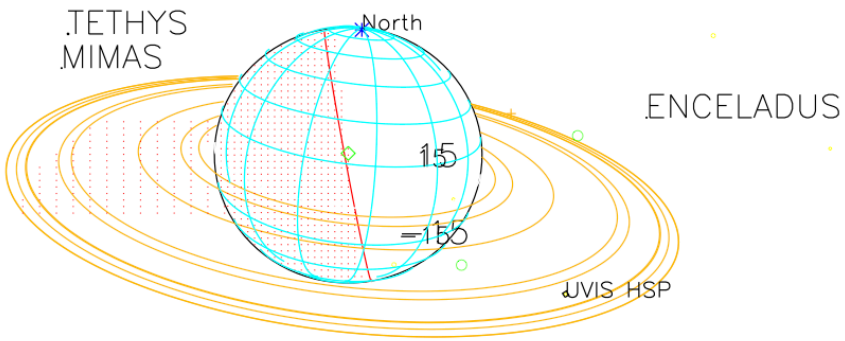

ZET CMA Rev 169 Egress
HSP Counts (per second)
10000
8000
6000
4000
2000
0
80000
100000
120000
140000
Ring Plane Radius (km)


ZET CMA Rev 169 Egress
Radial Resolution (m)
10
8
6
4
2
0
120000
127500
135000
142500
150000
Ring Plane Radius (km)


HSP Counts (per second)
10000
8000
6000
4000
2000
0
120000
127500
135000
142500
150000
Ring Plane Radius (km)


ϕ (degrees)
150
140
130
120
110
100
120000
127500
135000
142500
150000
Ring Plane Radius (km)

IAPETUS

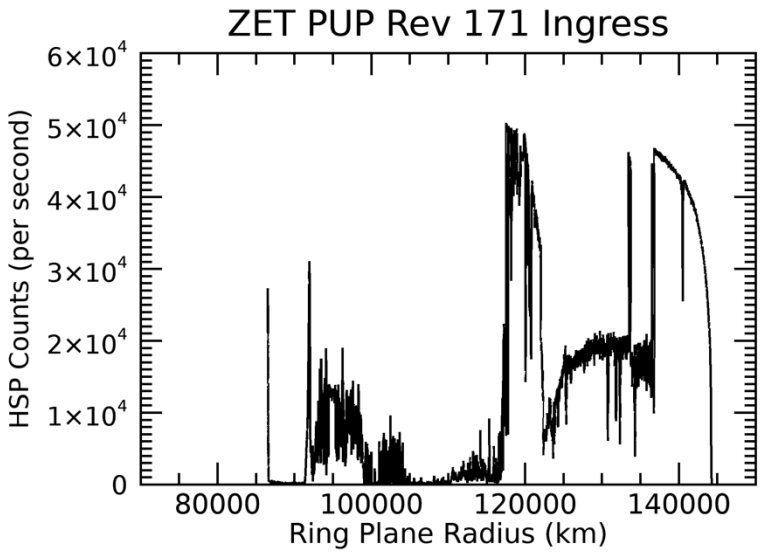


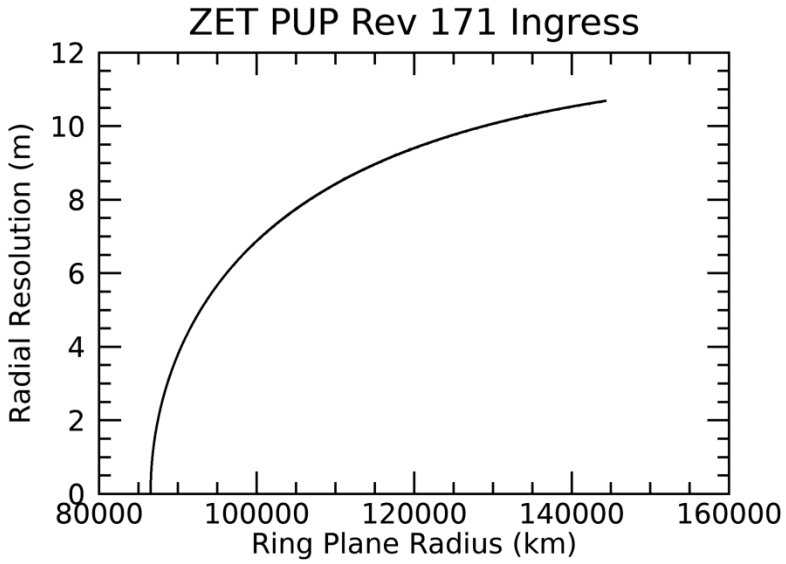
2012−205T00:33:00.000 310329.81 km

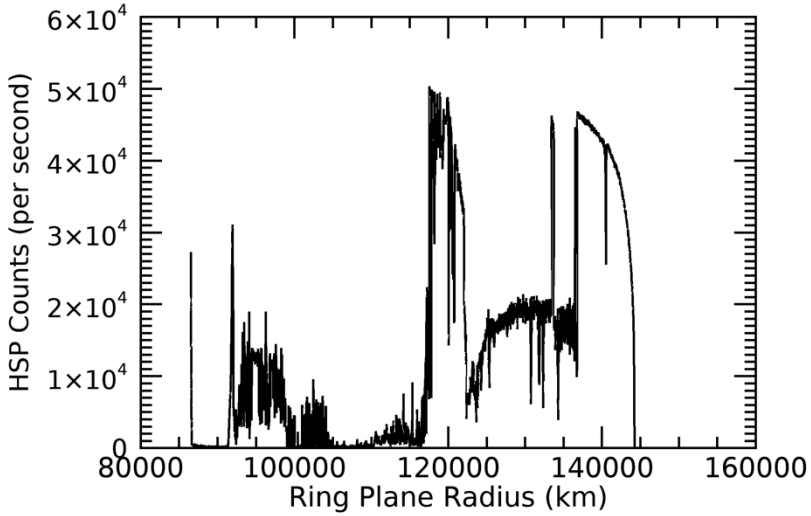
Target RA/dec: 115.41, −20.42

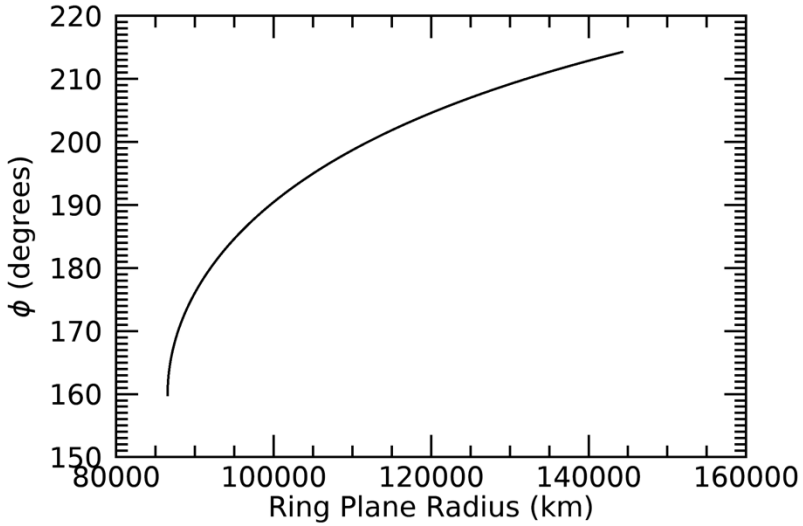
Subsolar lat/lon: 12.43, −67.23

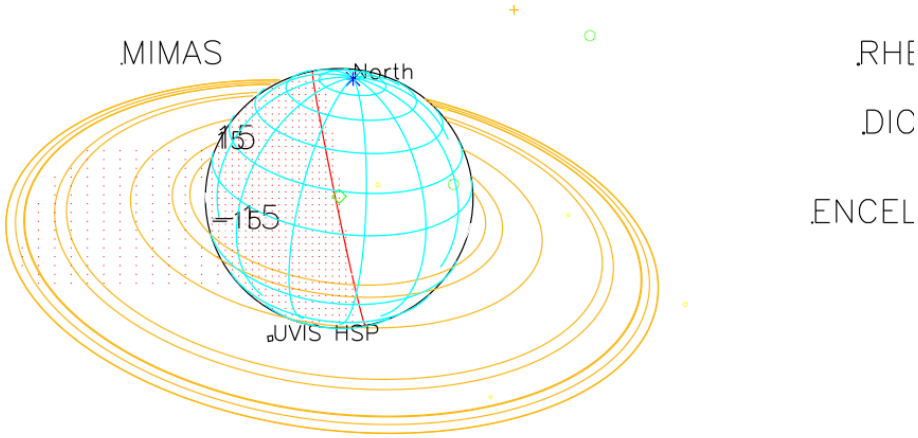
Sub−s/c lat/lon: 15.87, −161.71


ZET PUP Rev 171 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)


ZET PUP Rev 171 Ingress
Radial Resolution (m)
12
10
8
6
4
2
0
80000
100000
120000
140000
160000
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
Ring Plane Radius (km)


ϕ (degrees)
220
210
200
190
180
170
160
150
80000
100000
120000
140000
160000
Ring Plane Radius (km)

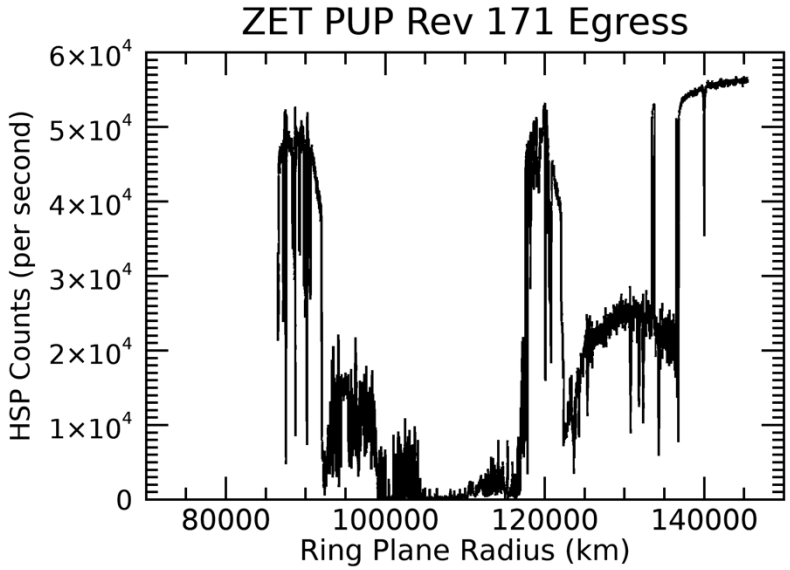


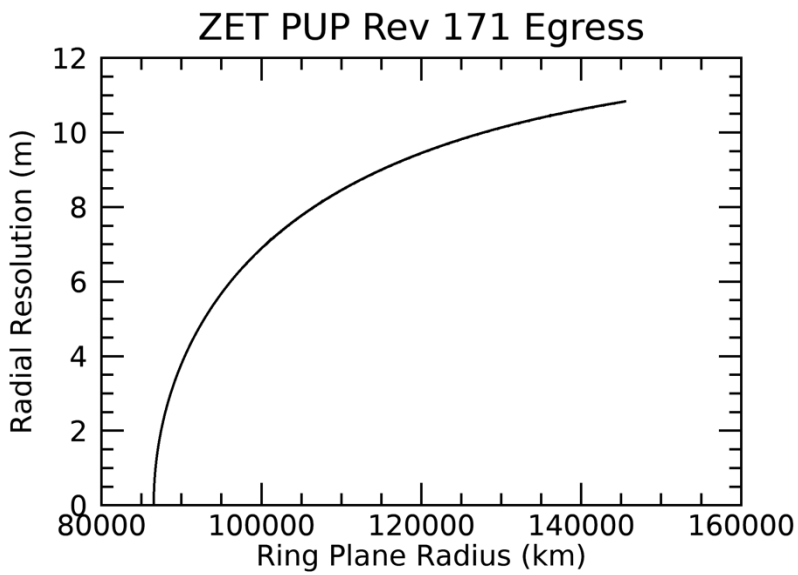
2012−247T09:17:00.000 351692.67 km

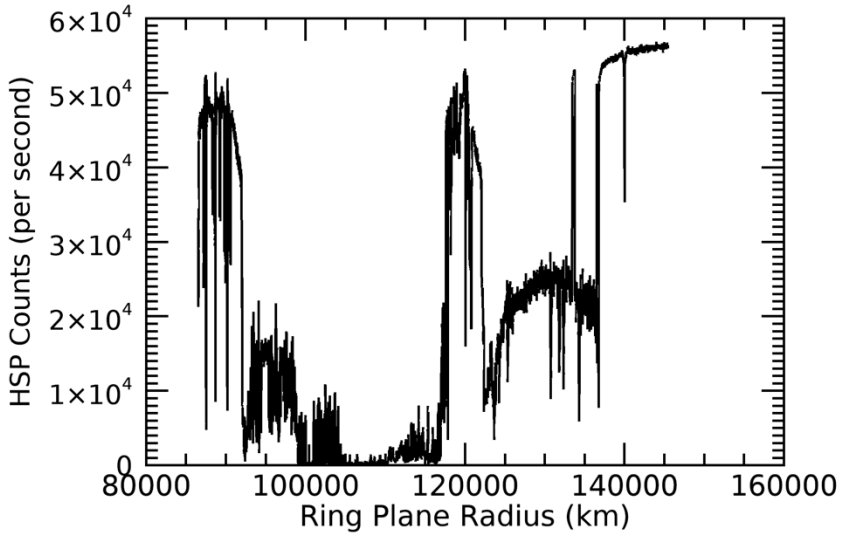
Target RA/dec: 114.32, −30.17

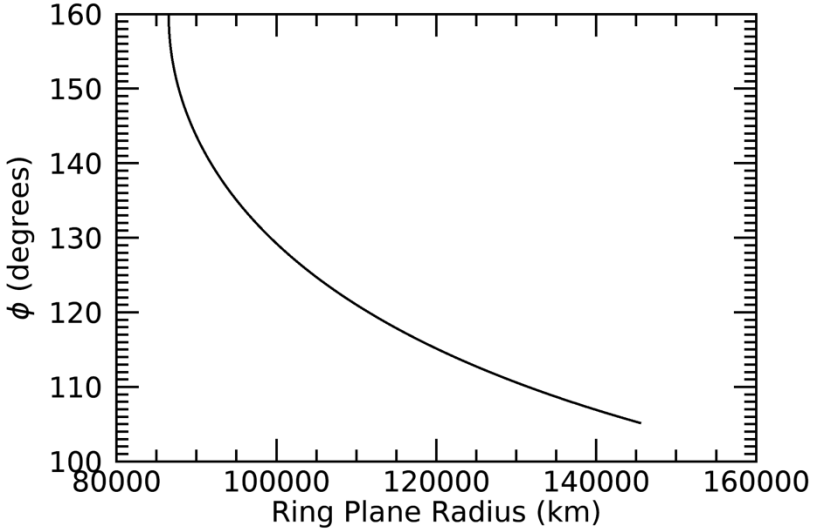
Subsolar lat/lon: 12.86, 145.69

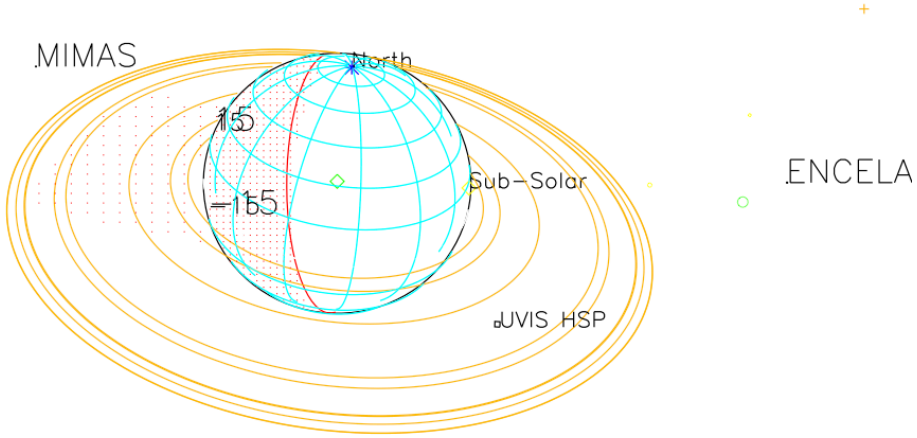
Sub−s/c lat/lon: 24.25, 47.59


ZET PUP Rev 171 Egress
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)


ZET PUP Rev 171 Egress
Radial Resolution (m)
12
10
8
6
4
2
0
80000
100000
120000
140000
160000
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
Ring Plane Radius (km)


ϕ (degrees)
160
150
140
130
120
110
100
80000
100000
120000
140000
160000
Ring Plane Radius (km)

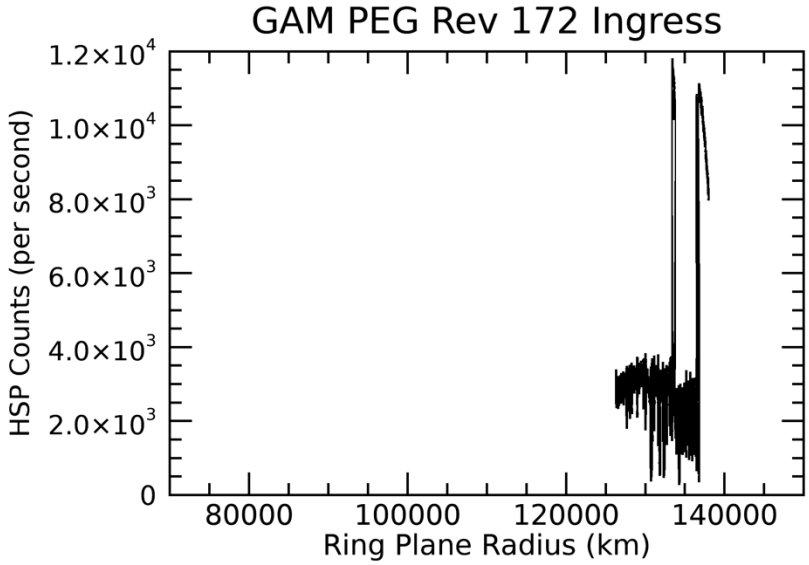


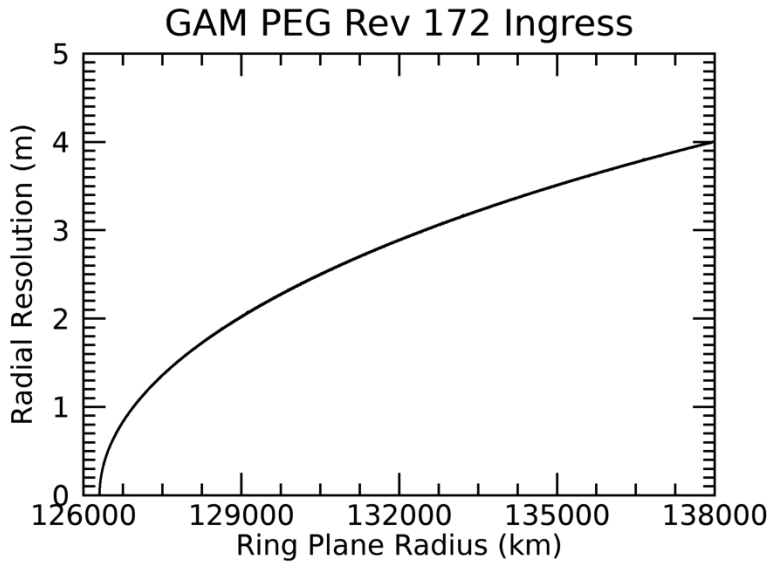
2012−247T11:38:00.000 371274.40 km

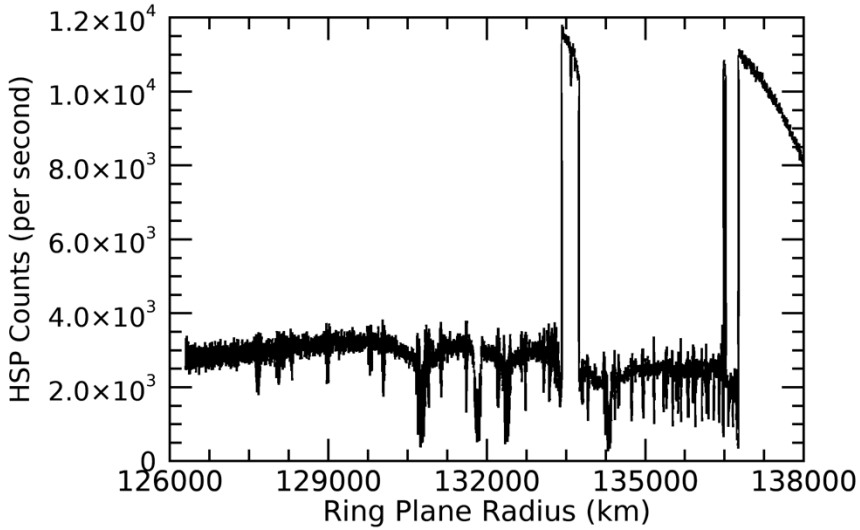
Target RA/dec: 135.29, −31.37

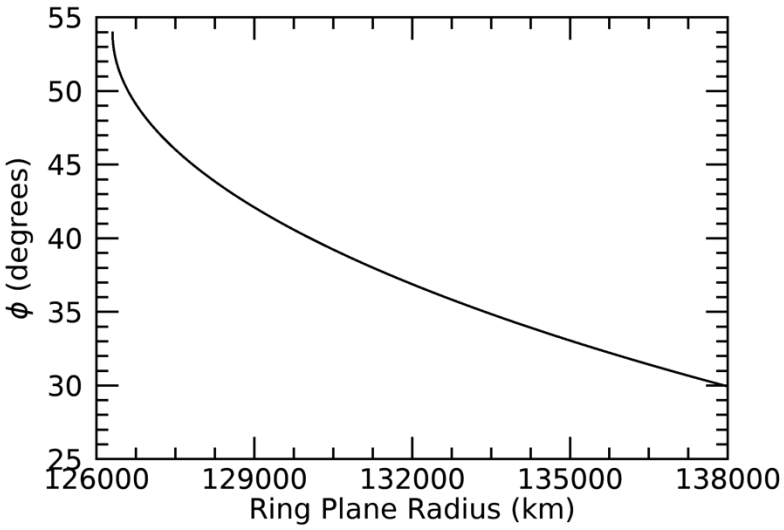
Subsolar lat/lon: 12.86, 66.30

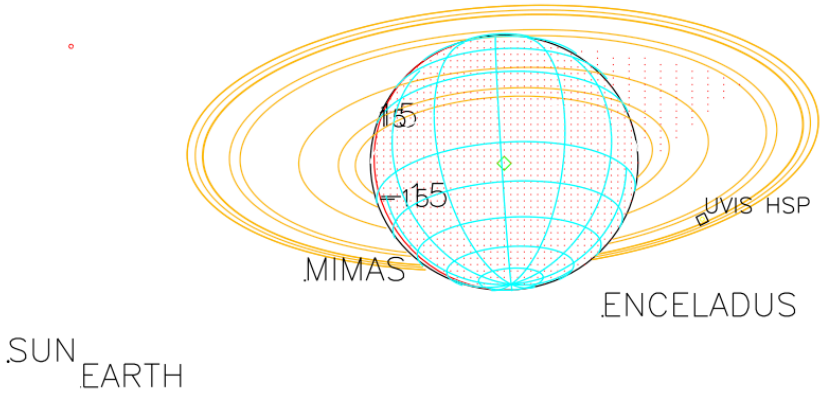
Sub−s/c lat/lon: 27.39, −11.36


GAM PEG Rev 172 Ingress
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)


GAM PEG Rev 172 Ingress
Radial Resolution (m)
5
4
3
2
1
0
126000
129000
132000
135000
138000
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
126000
129000
132000
135000
138000
Ring Plane Radius (km)


ϕ (degrees)
55
50
45
40
35
30
25
126000
129000
132000
135000
138000
Ring Plane Radius (km)

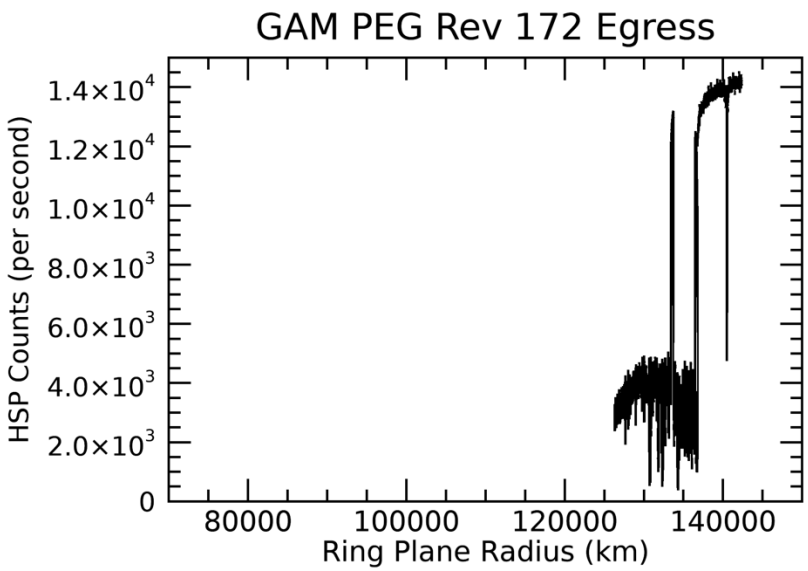


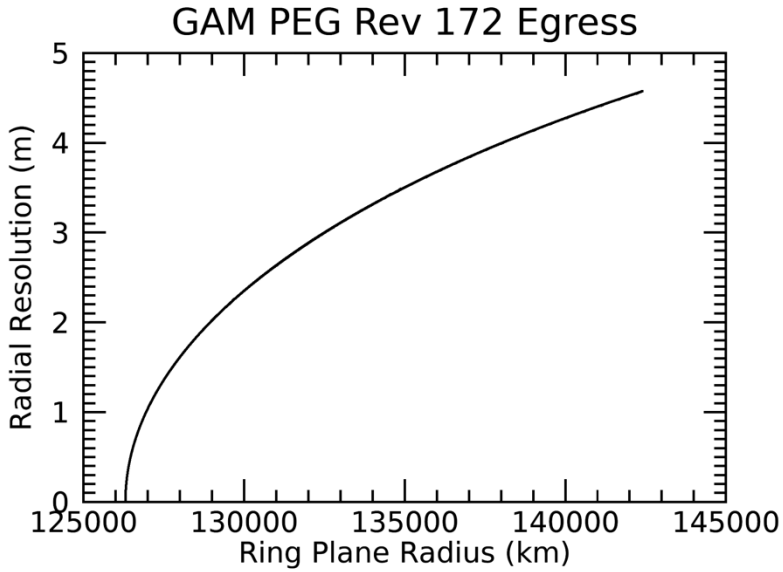
2012-267T19:38:00.000 668654.78 km

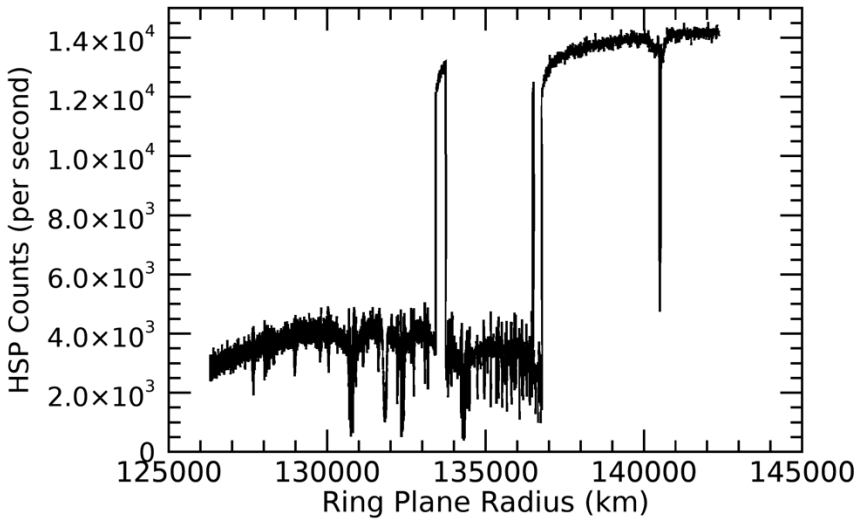
Target RA/dec: 11.21, 17.39

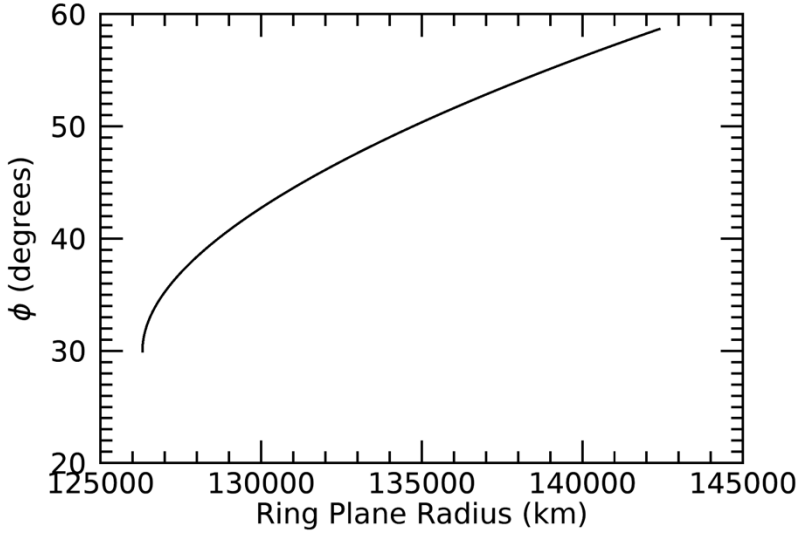
Subsolar lat/lon: 13.06, 140.79

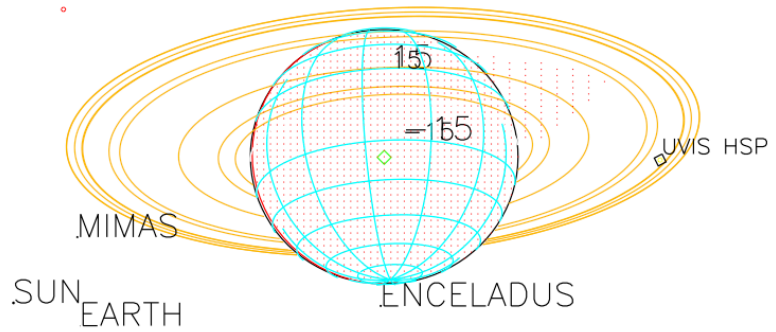
Sub-s/c lat/lon: -19.35, -58.80


GAM PEG Rev 172 Egress
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)


GAM PEG Rev 172 Egress
Radial Resolution (m)
5
4
3
2
1
0
125000
130000
135000
140000
145000
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
125000
130000
135000
140000
145000
Ring Plane Radius (km)


ϕ (degrees)
60
50
40
30
20
125000
130000
135000
140000
145000
Ring Plane Radius (km)



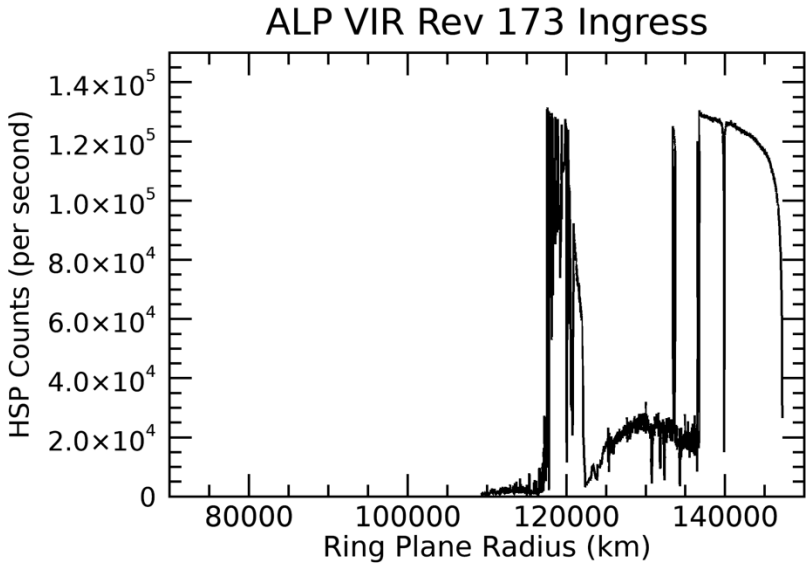
TITAN

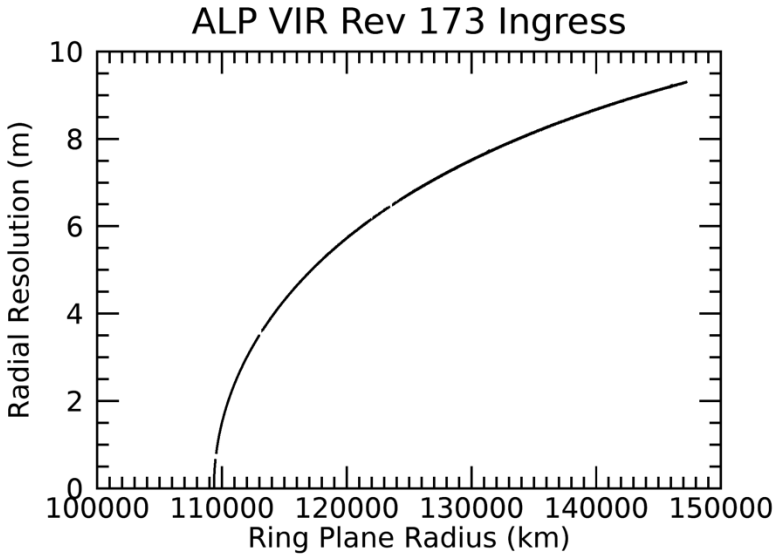
2012-267T21:19:00.000 632266.66 km

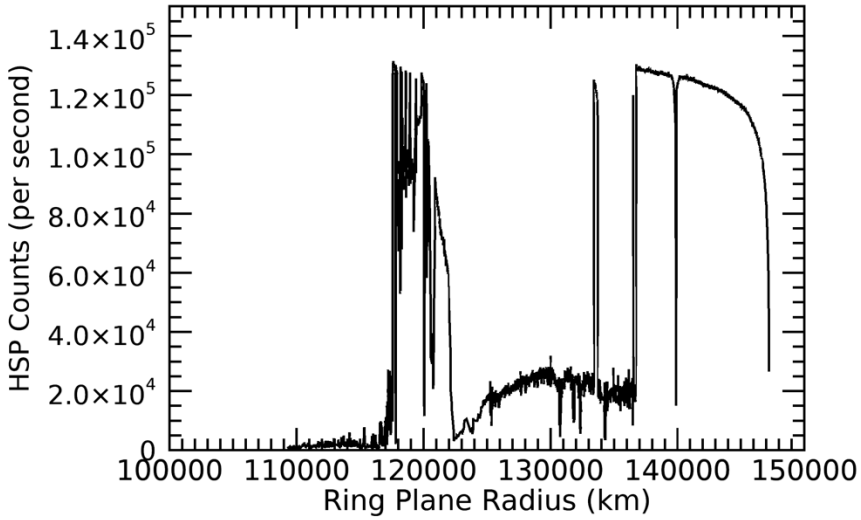
Target RA/dec: 14.89, 15.59

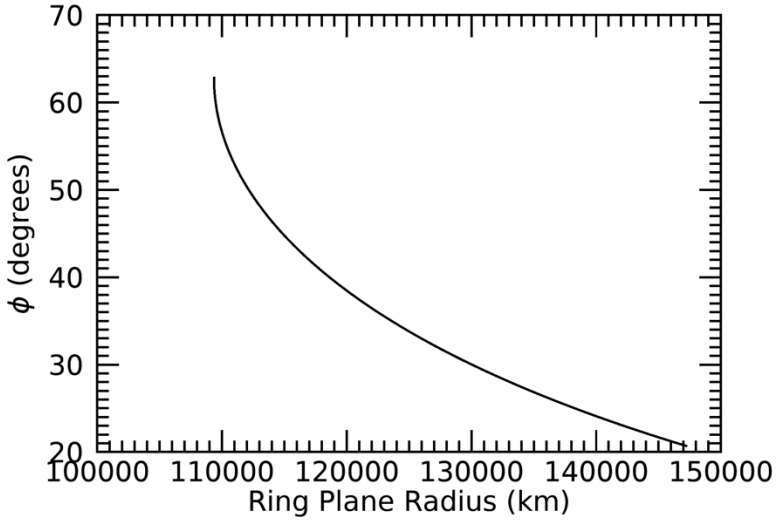
Subsolar lat/lon: 13.06, 83.93

Sub-s/c lat/lon: -17.98, -111.76


ALP VIR Rev 173 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)

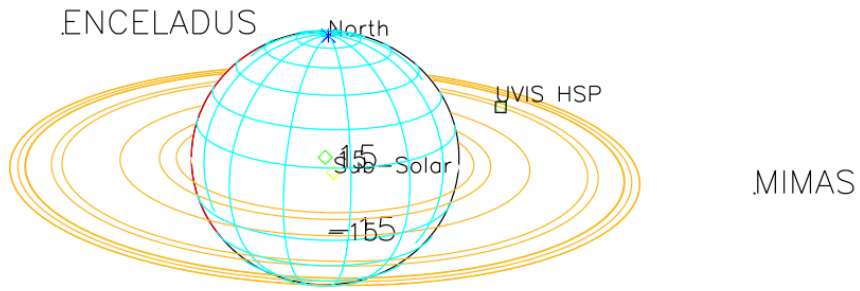

ALP VIR Rev 173 Ingress
Radial Resolution (m)
10
8
6
4
2
0
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)


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
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)


ϕ (degrees)
70
60
50
40
30
20
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)

IAPETUS

TITAN

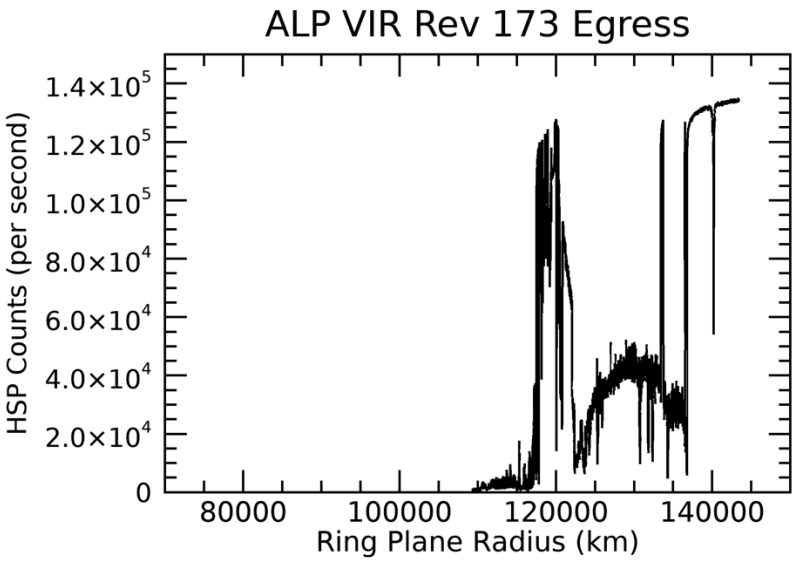


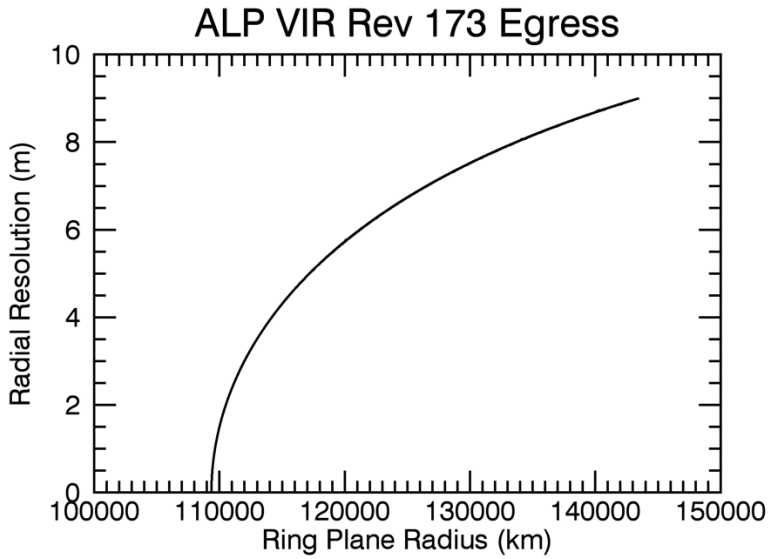
2012-293T10:08:00.000 783769.17 km

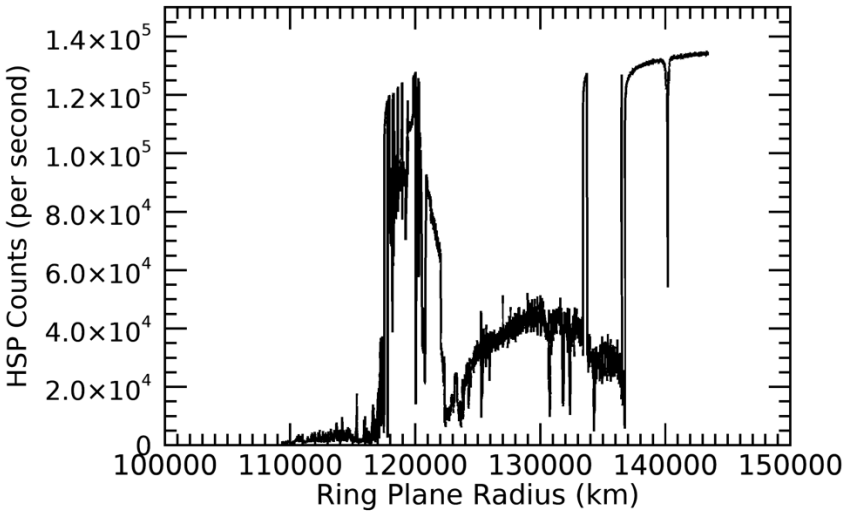
Target RA/dec: 207.18, -12.80

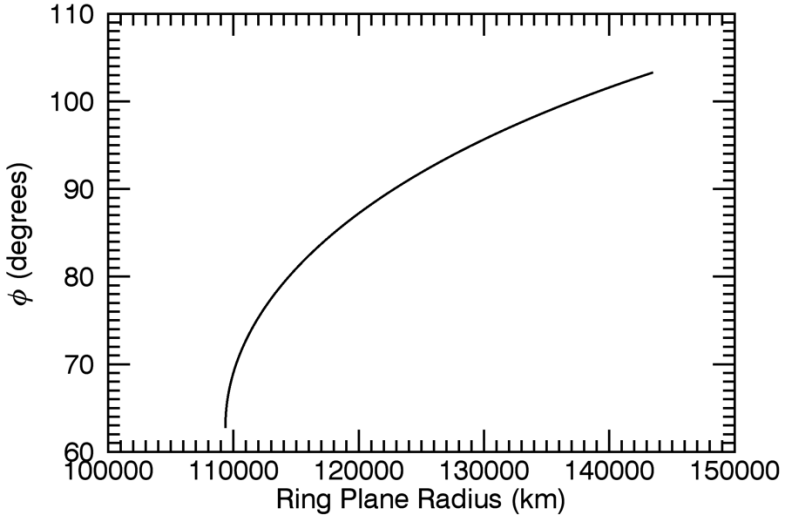
Subsolar lat/lon: 13.31, -98.12

Sub-s/c lat/lon: 15.94, -101.77


ALP VIR Rev 173 Egress
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)

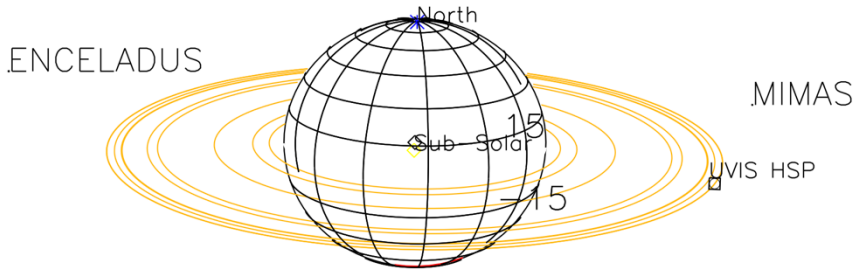

ALP VIR Rev 173 Egress
Radial Resolution (m)
10
8
6
4
2
0
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)


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
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)


ϕ (degrees)
110
100
90
80
70
60
100000
110000
120000
130000
140000
150000
Ring Plane Radius (km)

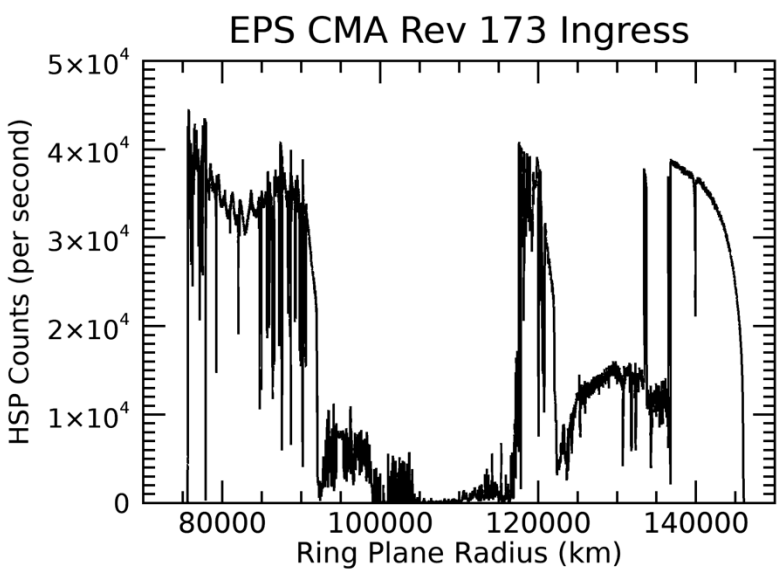
IAPETUS

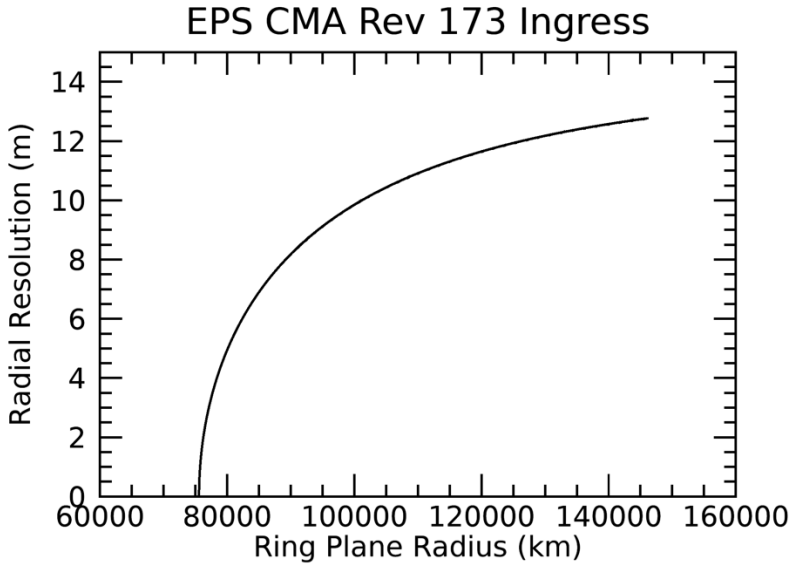
TITAN

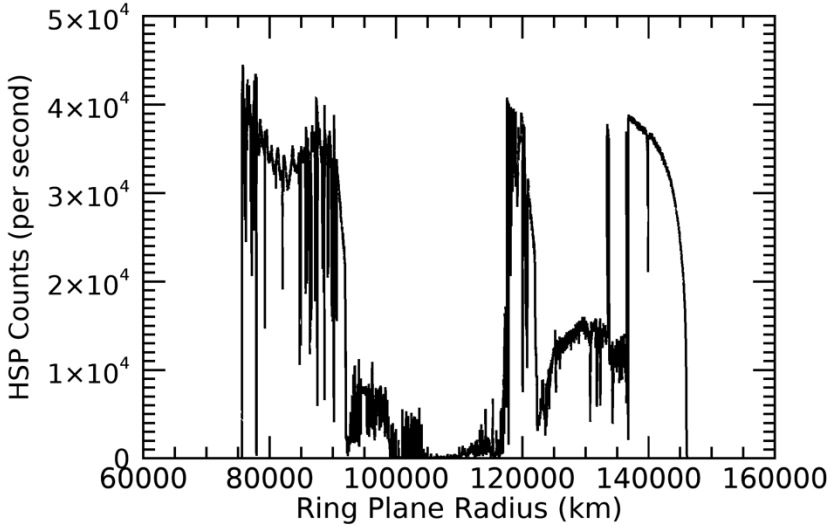


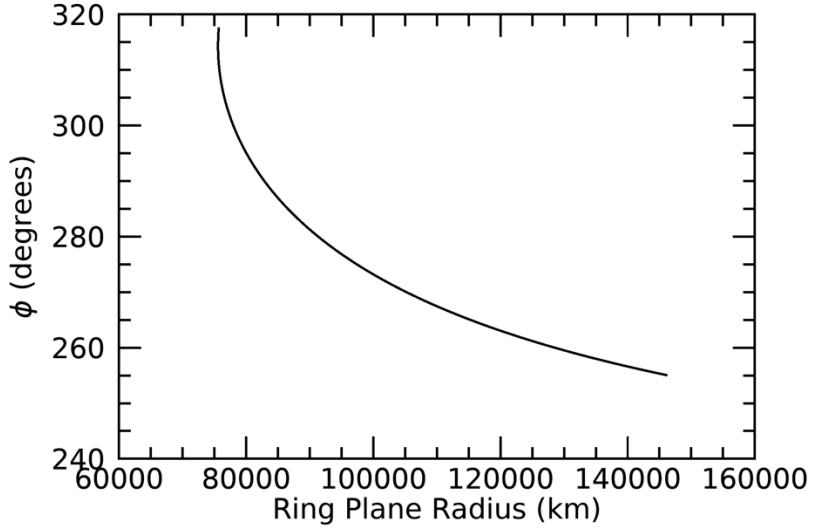
IE

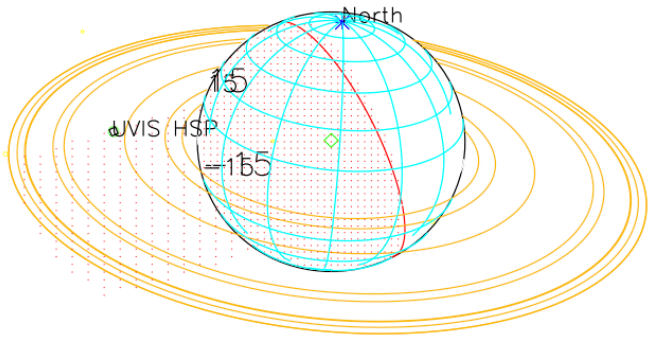
2012−293T12:45:00.000 829137.14 km
Target RA/dec: 210.95, −10.06
Subsolar lat/lon: 13.31, 173.49
[illegible] 829137.14 km


EPS CMA Rev 173 Ingress
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)


EPS CMA Rev 173 Ingress
Radial Resolution (m)
14
12
10
8
6
4
2
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


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


ϕ (degrees)
320
300
280
260
240
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

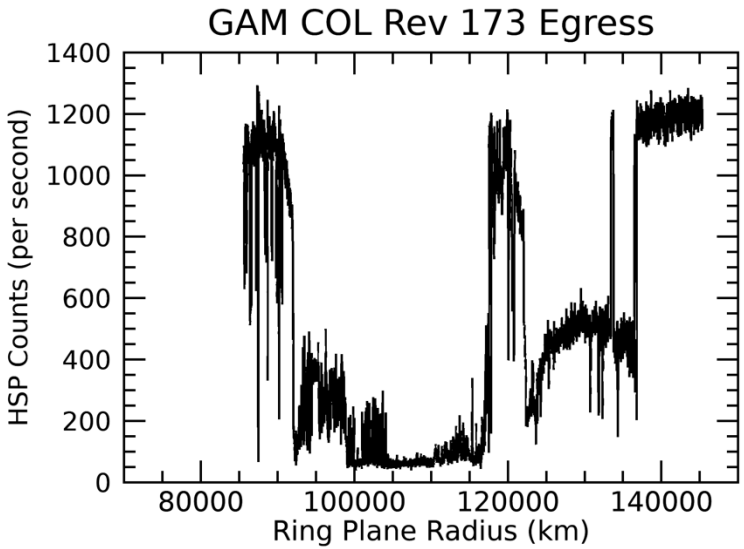


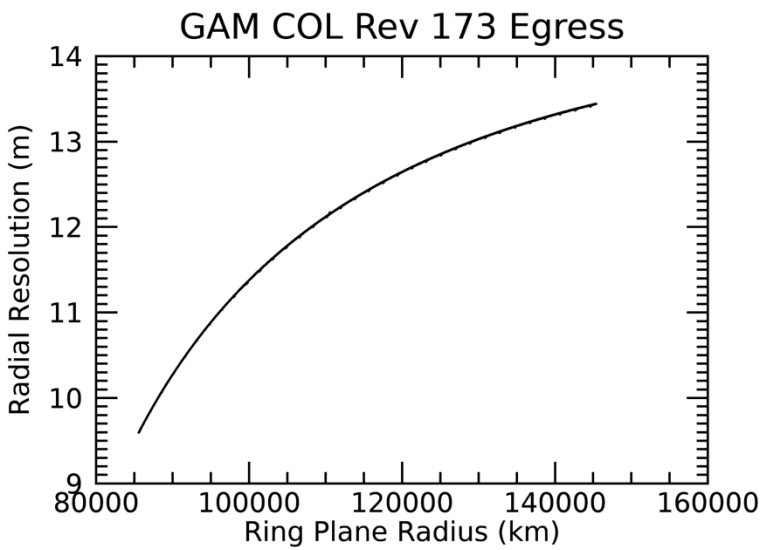
MIMAS

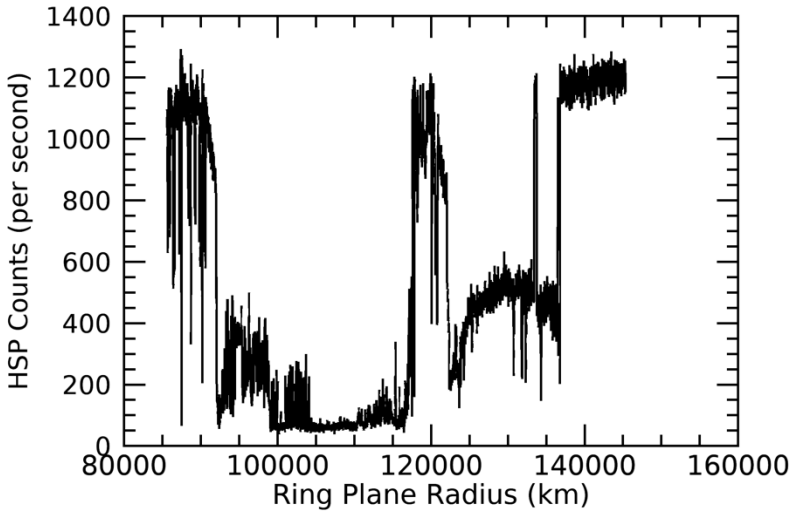
HYS

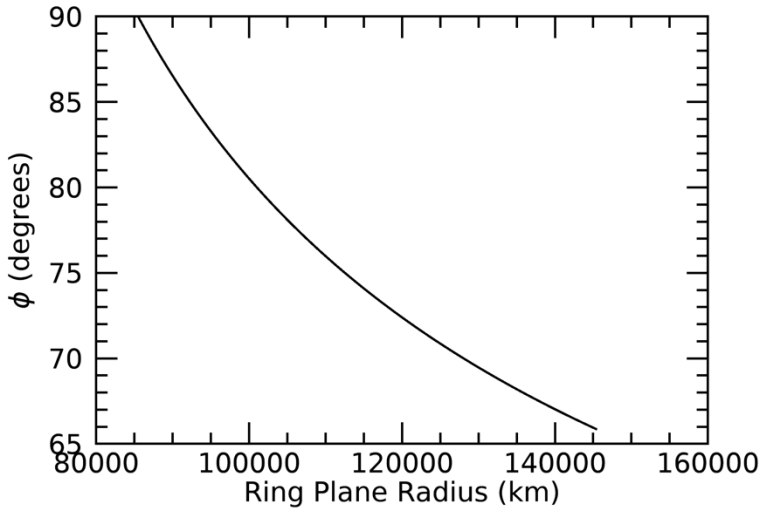
ENCELADUS

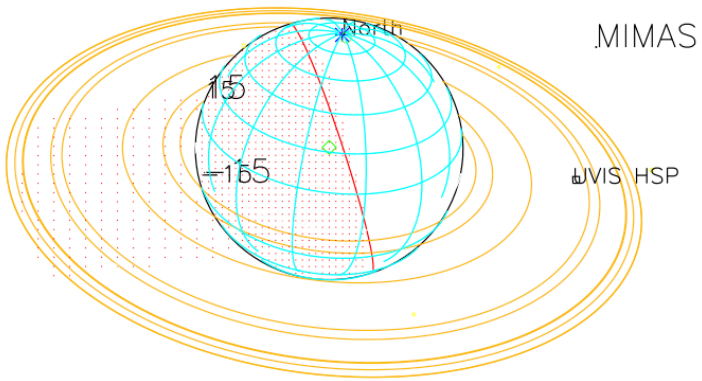
2012−292T05:33:00.000 483903.36 km
Target RA/dec: 91.45, −30.08
Subsolar lat/lon: 13.30, 147.47
Sub−s/c lat/lon: 22.02, 25.94


GAM COL Rev 173 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
200
400
600
800
1000
1200
1400
80000
100000
120000
140000


GAM COL Rev 173 Egress
Radial Resolution (m)
Ring Plane Radius (km)
9
10
11
12
13
14
80000
100000
120000
140000
160000


HSP Counts (per second)
Ring Plane Radius (km)
0
200
400
600
800
1000
1200
1400
80000
100000
120000
140000
160000


ϕ (degrees)
Ring Plane Radius (km)
65
70
75
80
85
90
80000
100000
120000
140000
160000



MIMAS

UVIS HSP

ENCELA

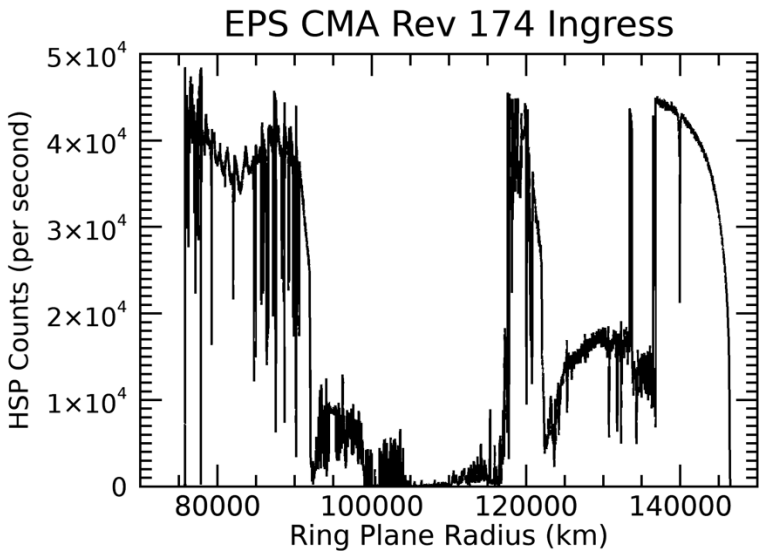
TETHYS

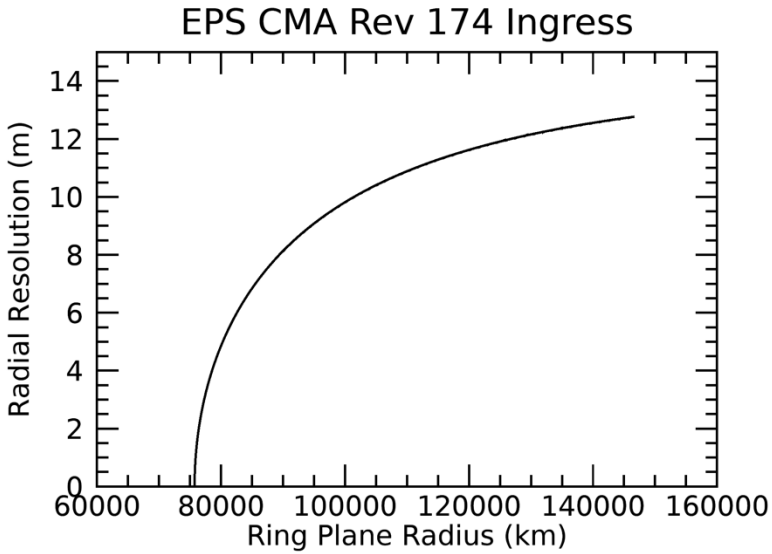
2012−292T08:08:00.000 475381.09 km

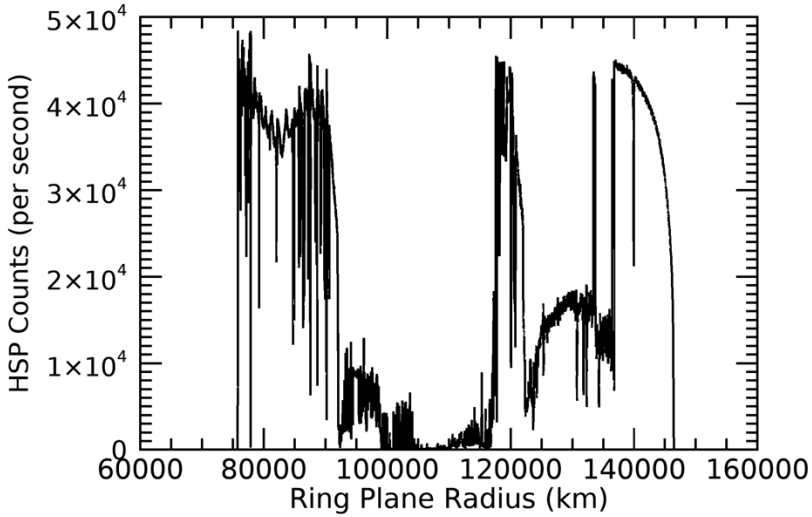
Target RA/dec: 105.70, −34.70

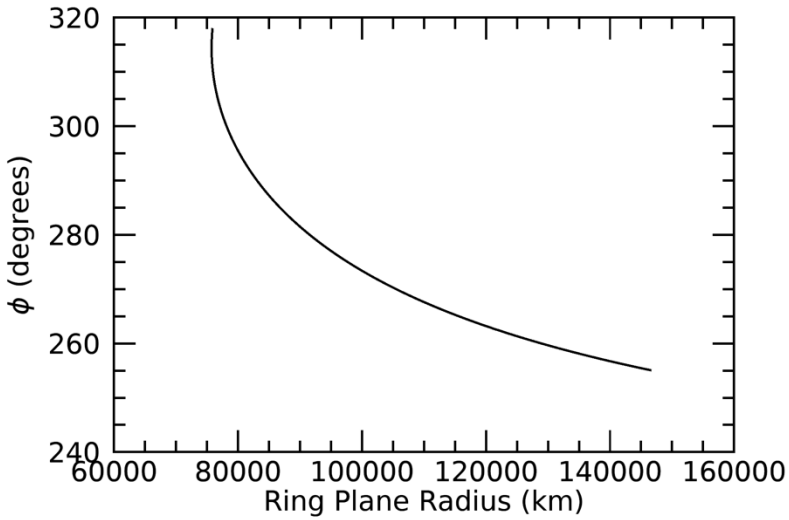
Subsolar lat/lon: 13.30, 60.20

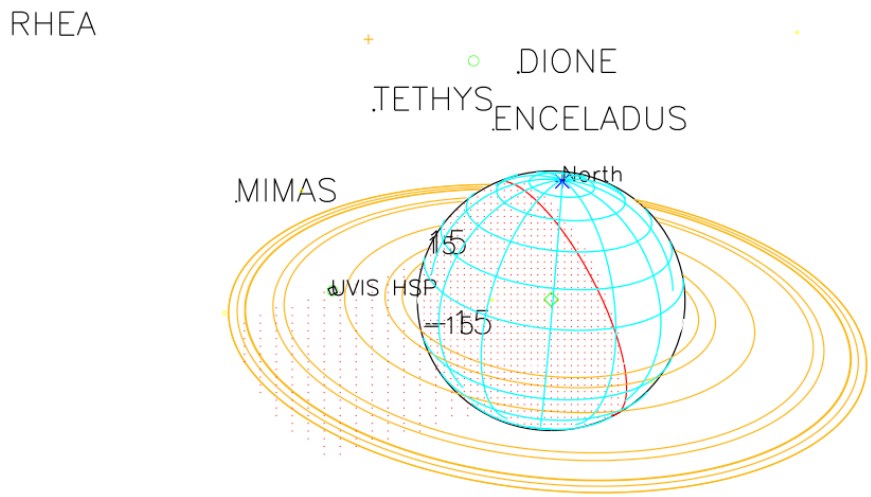
Sub−s/c lat/lon: 27.32, −48.25


EPS CMA Rev 174 Ingress
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)


EPS CMA Rev 174 Ingress
Radial Resolution (m)
14
12
10
8
6
4
2
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


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


ϕ (degrees)
320
300
280
260
240
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

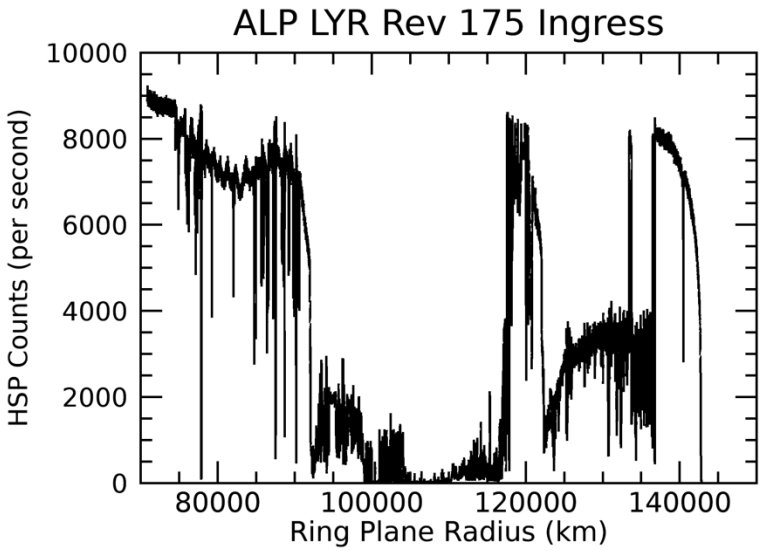


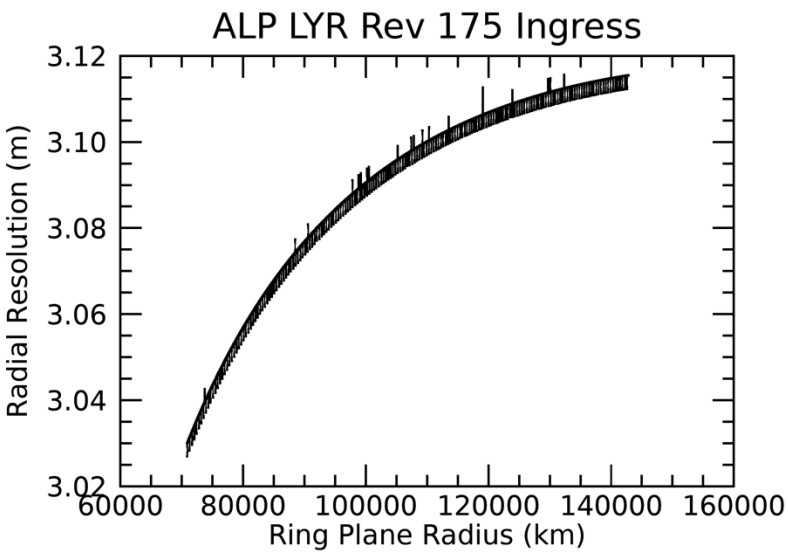
2012−316T04:00:00.000 484085.71 km

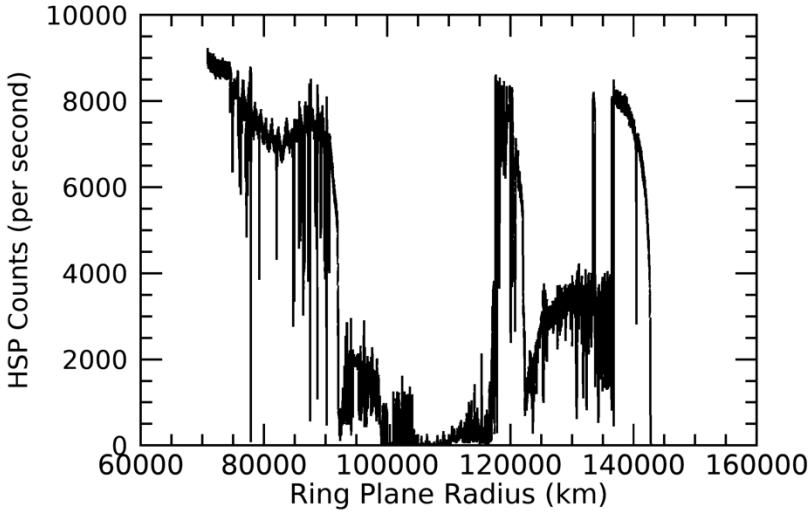
Target RA/dec: 91.40, −30.08

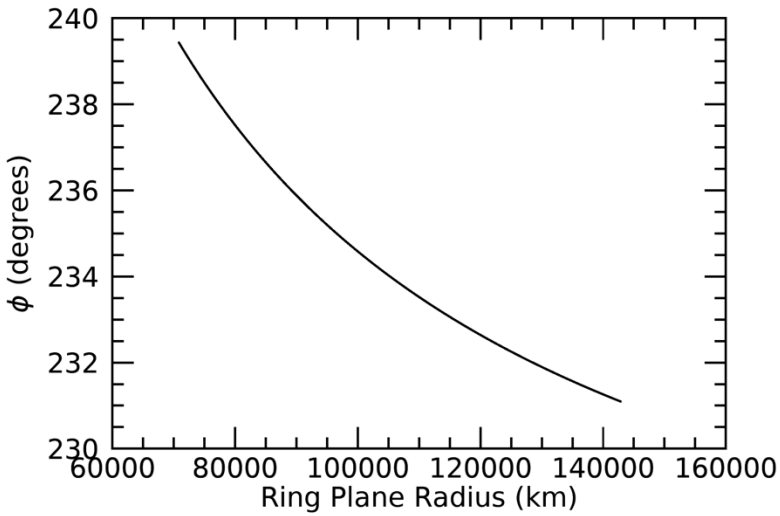
Subsolar lat/lon: 13.53, −178.48

Sub−s/c lat/lon: 22.01, 59.20


ALP LYR Rev 175 Ingress
HSP Counts (per second)
10000
8000
6000
4000
2000
0
80000
100000
120000
140000
Ring Plane Radius (km)


ALP LYR Rev 175 Ingress
Radial Resolution (m)
3.12
3.10
3.08
3.06
3.04
3.02
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

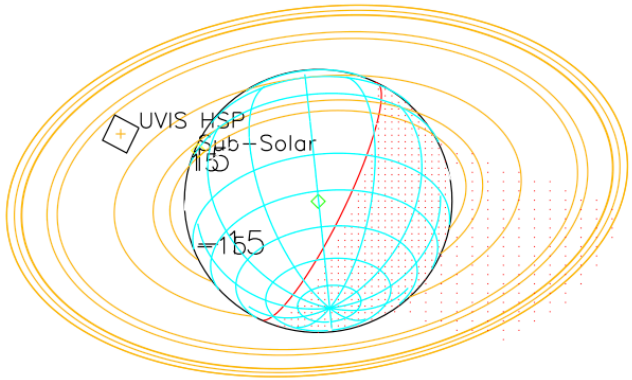

HSP Counts (per second)
10000
8000
6000
4000
2000
0
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
240
238
236
234
232
230
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

DIONE

ENCELADUS

MIMAS



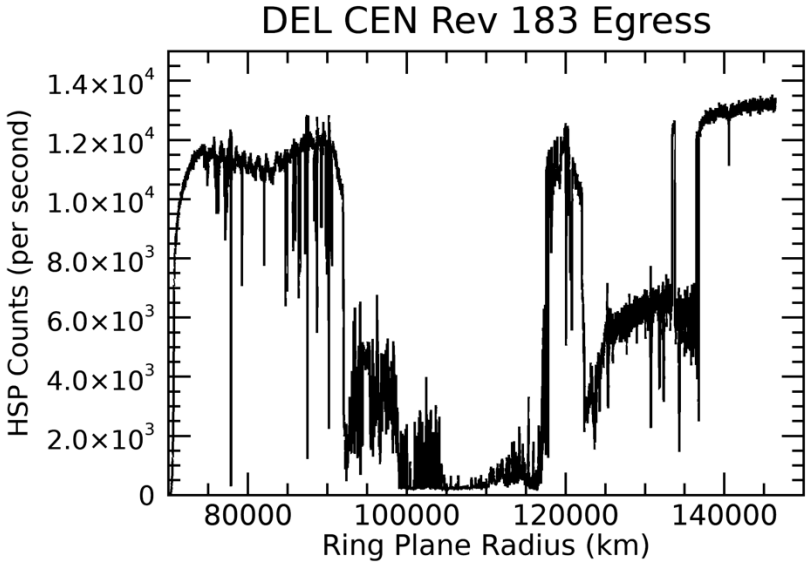
TETHYS

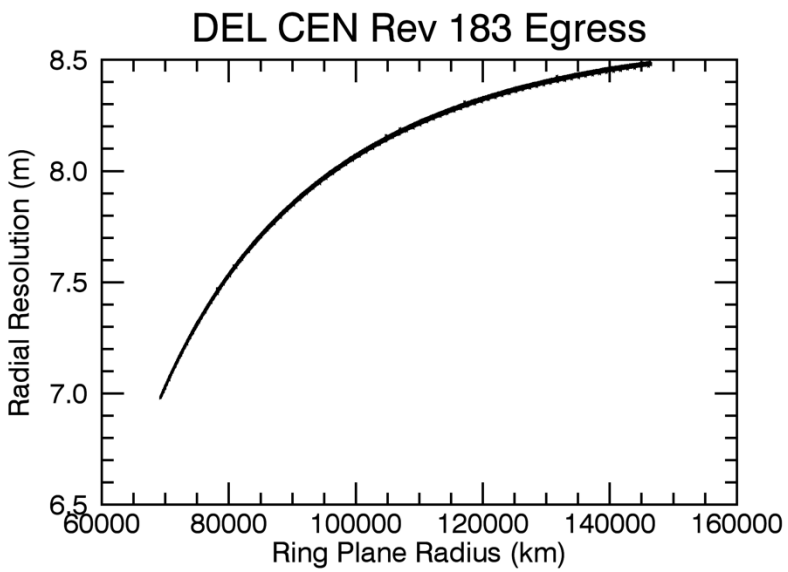
2012-324T11:00:00.000 2025609.8 km

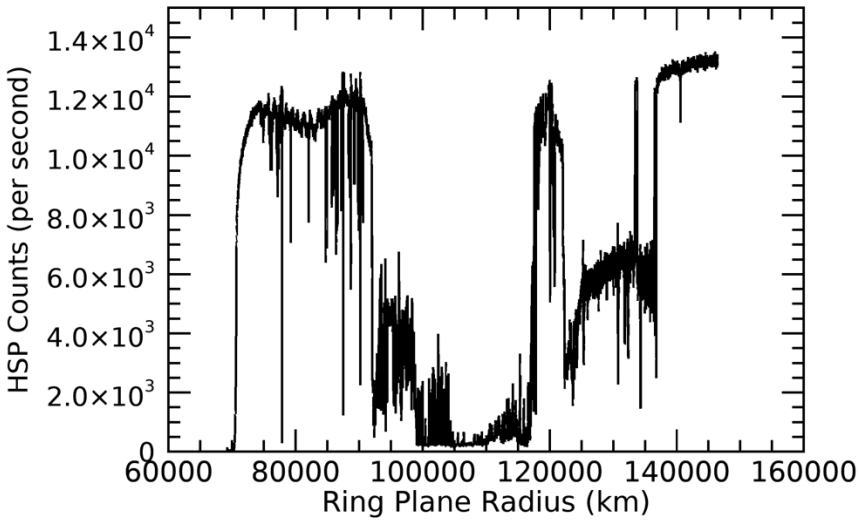
Target RA/dec: 276.01, 38.01

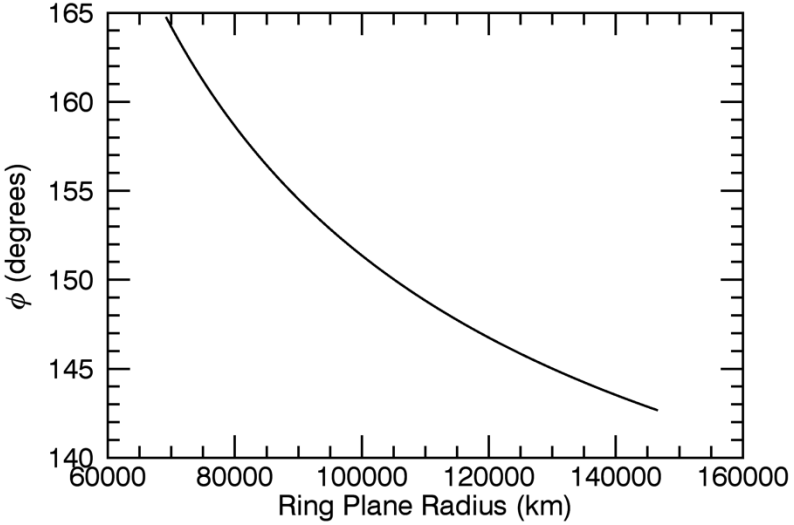
Subsolar lat/lon: 13.61, -61.01

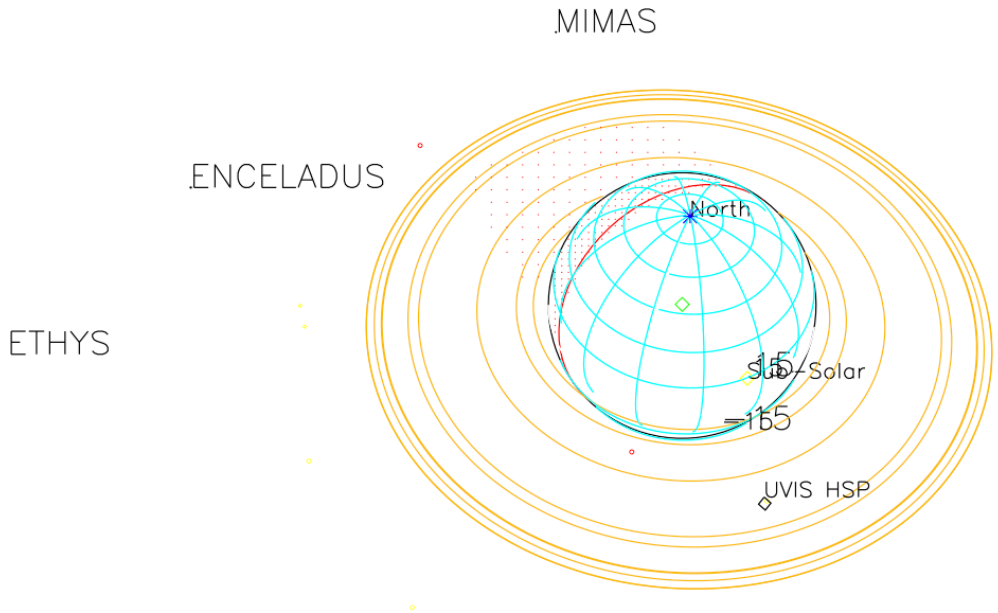
Sub-s/c lat/lon: -29.04, -0.15


DEL CEN Rev 183 Egress
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 CEN Rev 183 Egress
Radial Resolution (m)
8.5
8.0
7.5
7.0
6.5
60000
80000
100000
120000
140000
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
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
165
160
155
150
145
140
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

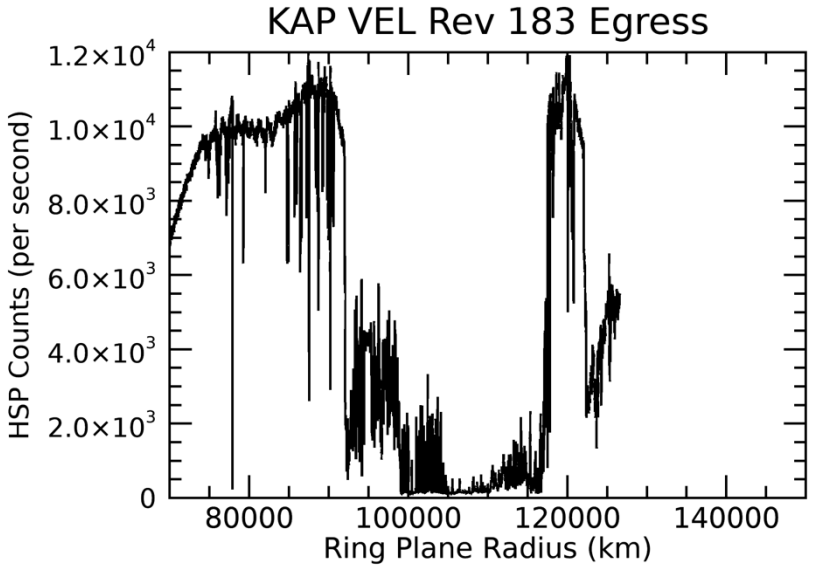


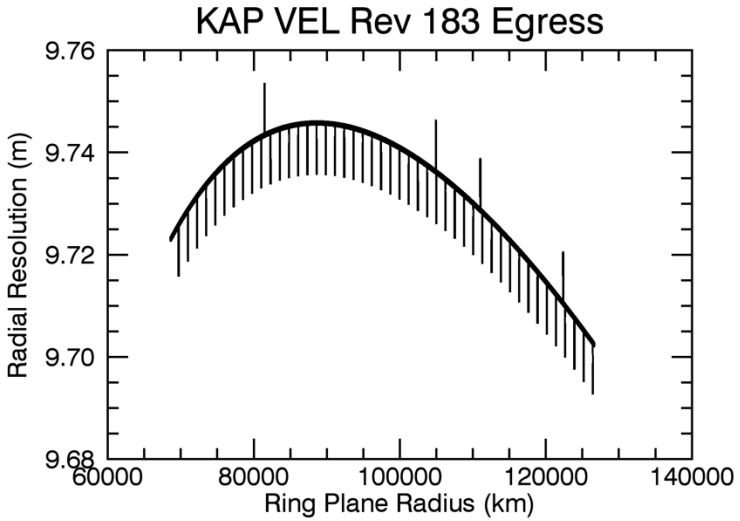
2013-069T23:54:00.000 652704.03 km

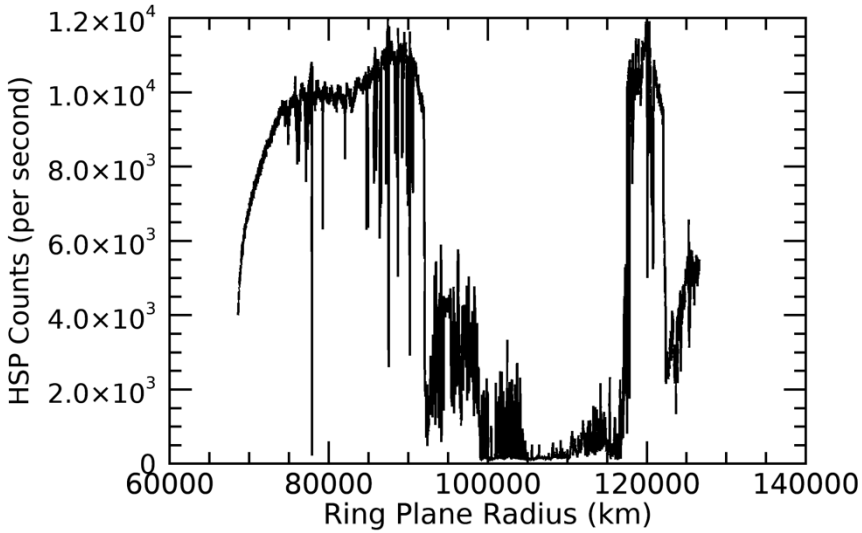
Target RA/dec: 187.34, -43.42

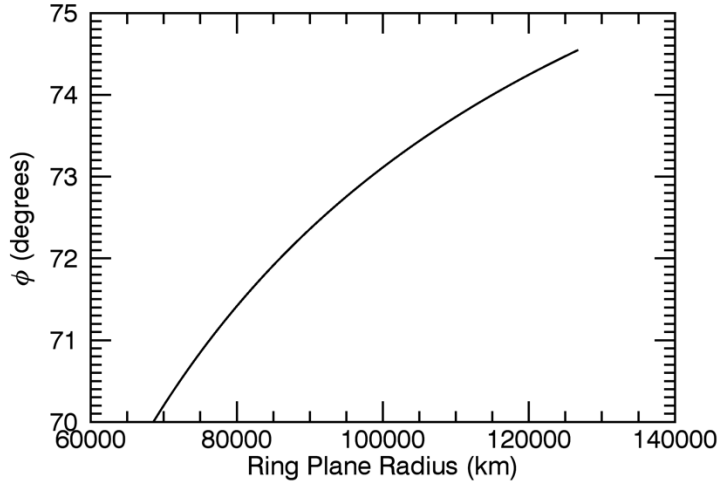
Subsolar lat/lon: 14.66, -131.52

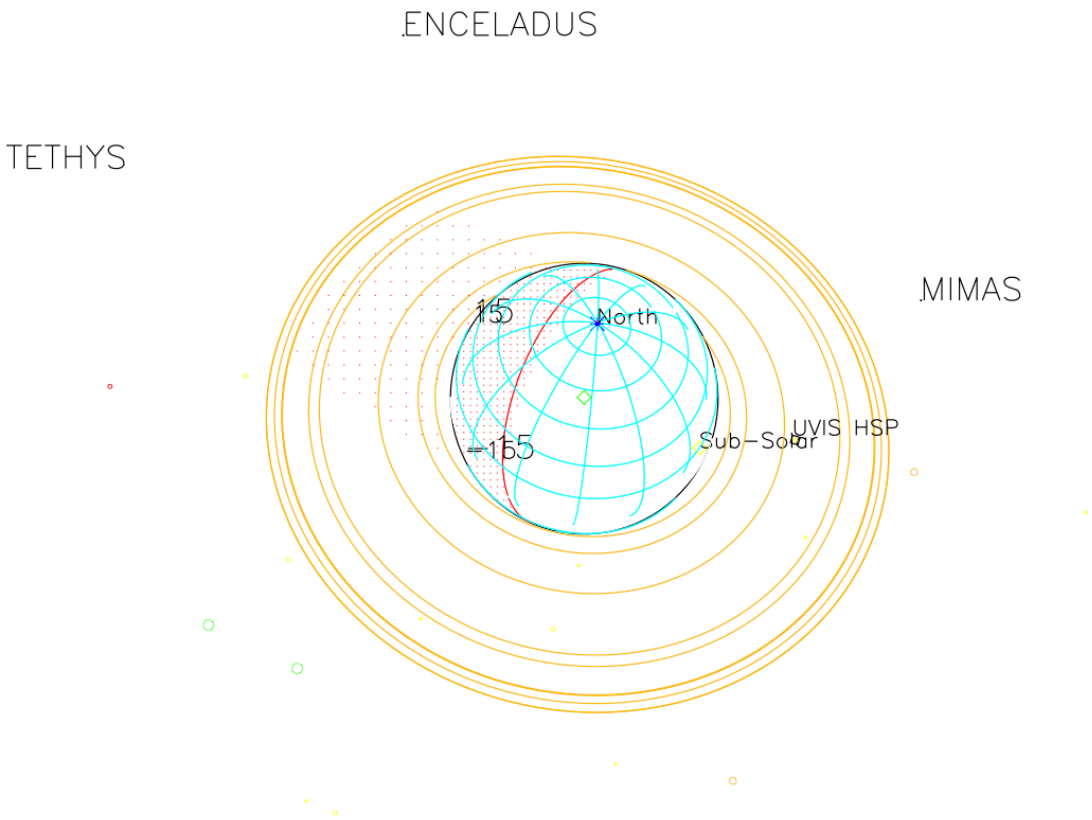
Sub-s/c lat/lon: 43.33, -162.86


KAP VEL Rev 183 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)


KAP VEL Rev 183 Egress
Radial Resolution (m)
9.76
9.74
9.72
9.70
9.68
60000
80000
100000
120000
140000
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
60000
80000
100000
120000
140000
Ring Plane Radius (km)


φ (degrees)
75
74
73
72
71
70
60000
80000
100000
120000
140000
Ring Plane Radius (km)

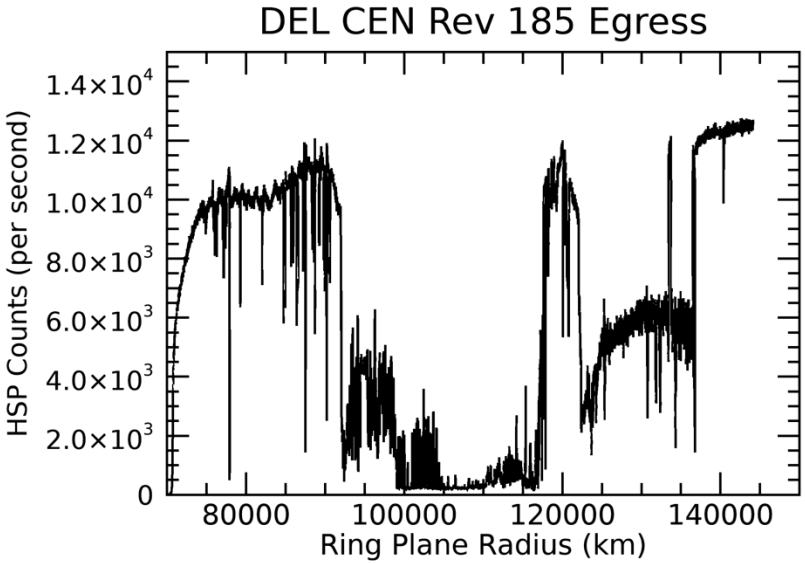


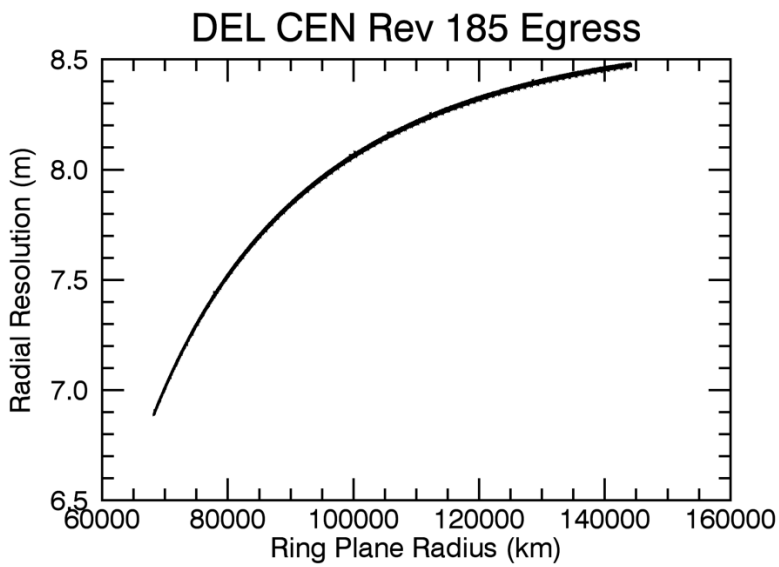
2013−069T16:27:00.000 562505.21 km

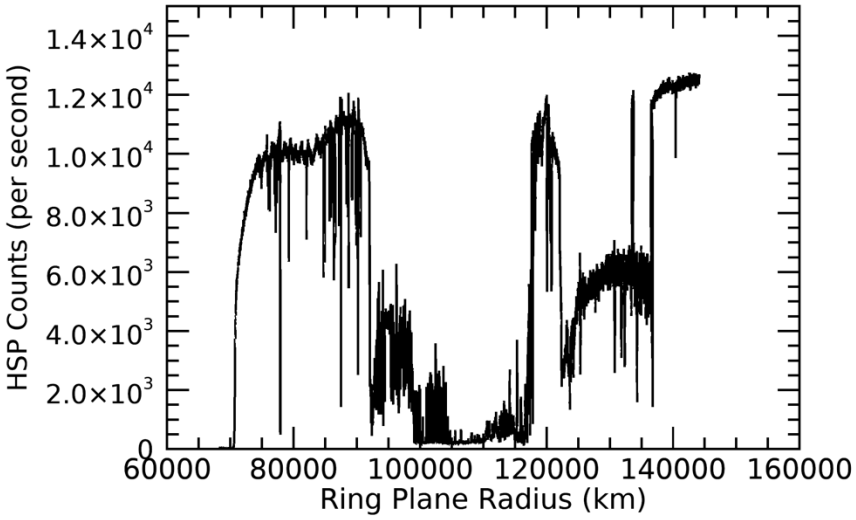
Target RA/dec: 157.50, −54.31

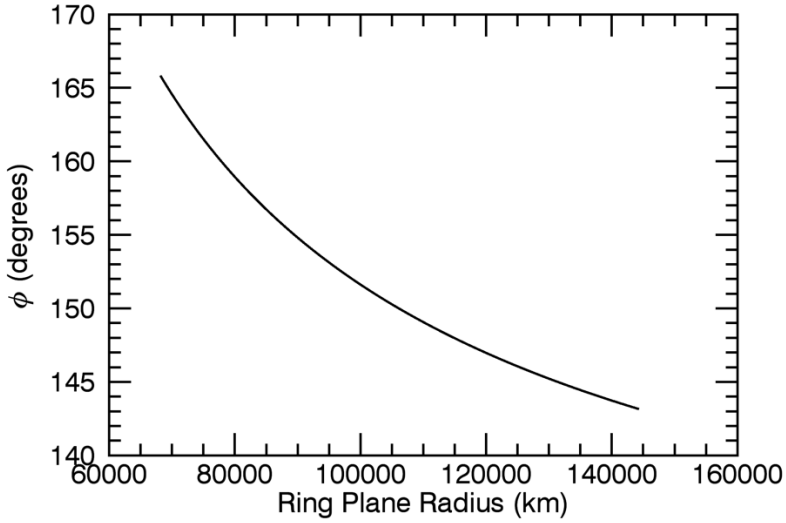
Subsolar lat/lon: 14.66, 120.15

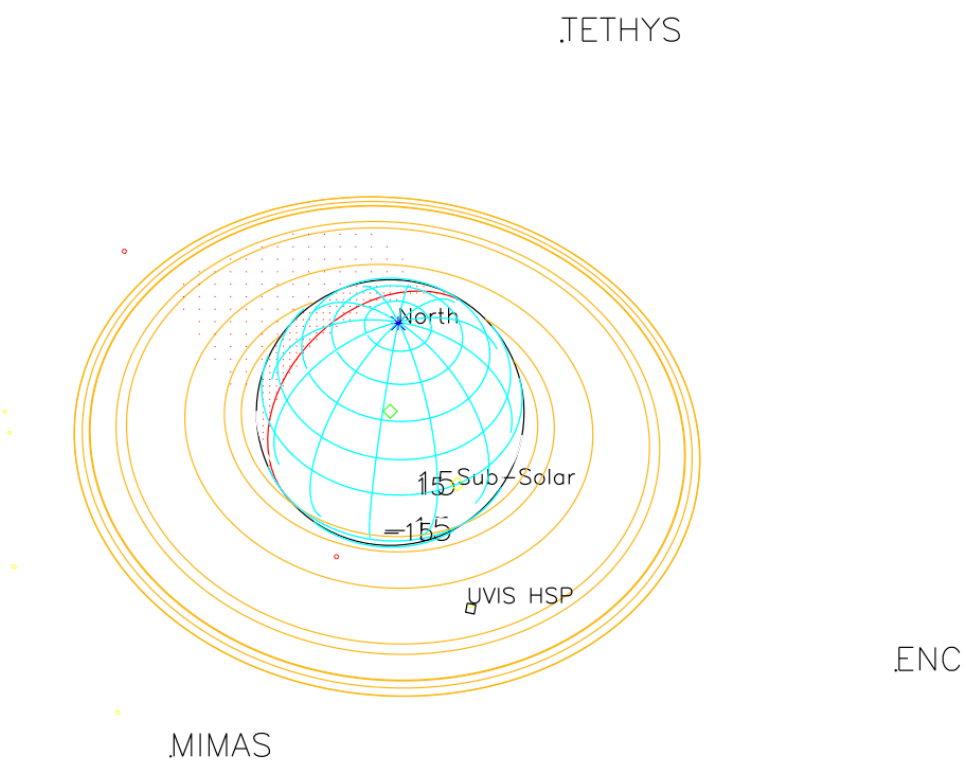
Sub−s/c lat/lon: 51.79, 54.12


DEL CEN Rev 185 Egress
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 CEN Rev 185 Egress
Radial Resolution (m)
8.5
8.0
7.5
7.0
6.5
60000
80000
100000
120000
140000
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
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
170
165
160
155
150
145
140
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

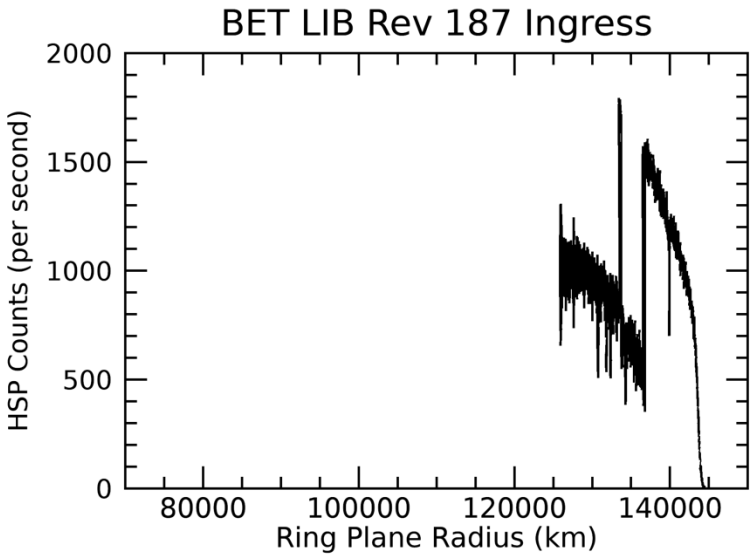


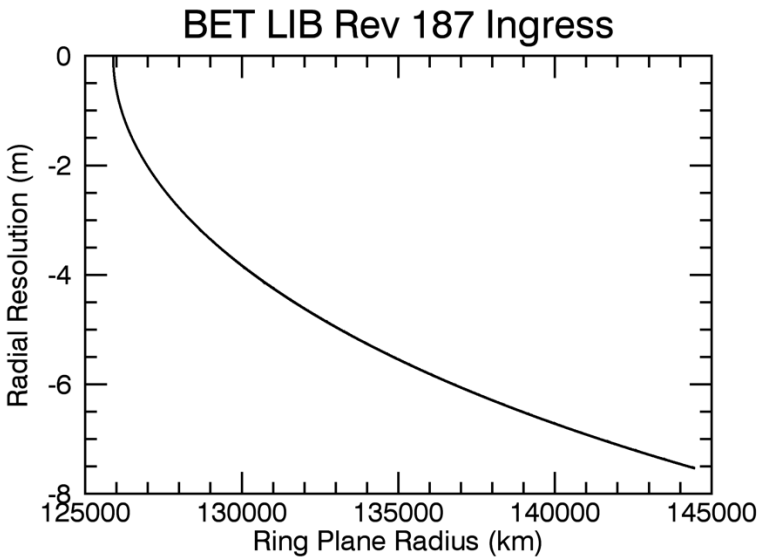
2013-093T21:55:00.000 651378.15 km

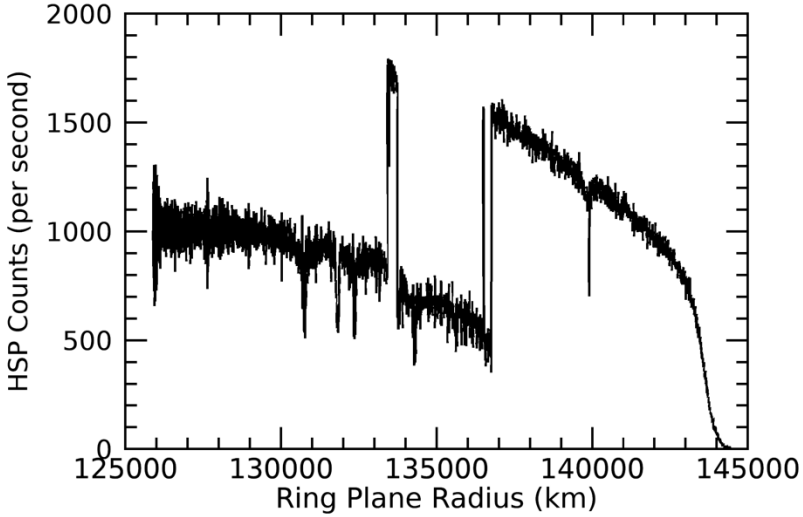
Target RA/dec: 187.14, -43.49

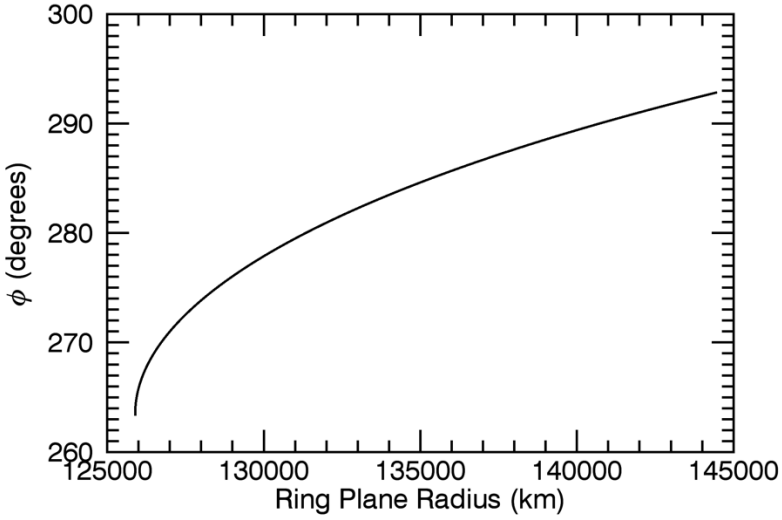
Subsolar lat/lon: 14.88, -82.83

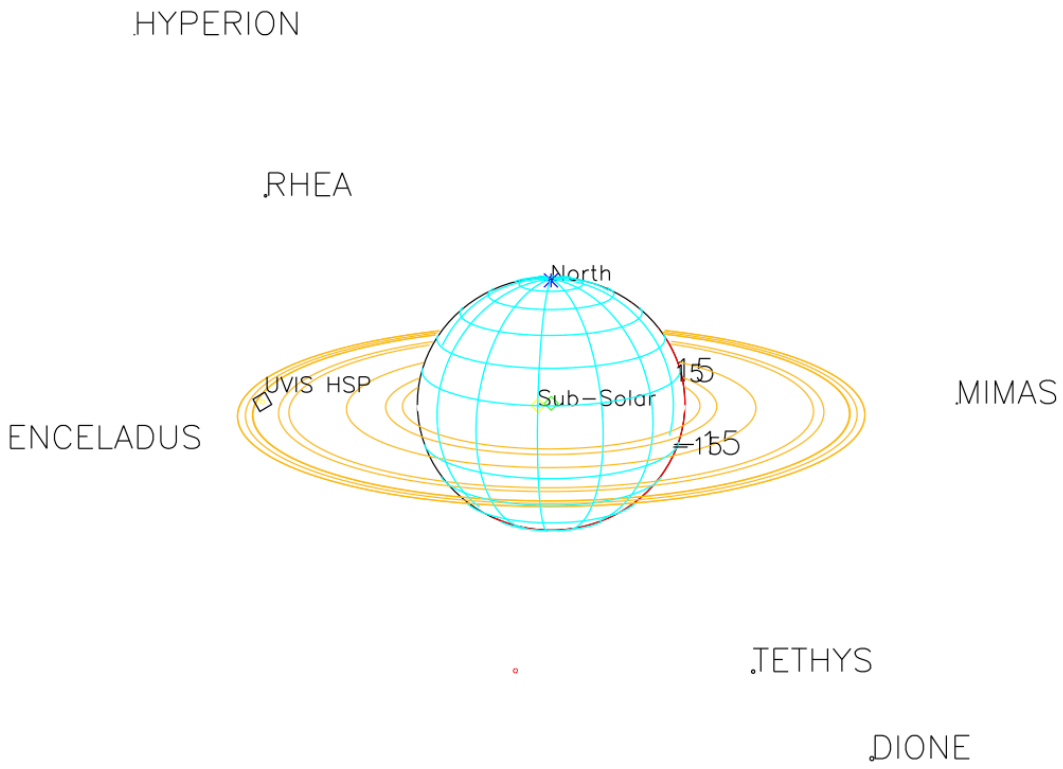
Sub-s/c lat/lon: 43.40, -115.14


BET LIB Rev 187 Ingress
HSP Counts (per second)
2000
1500
1000
500
0
80000
100000
120000
140000
Ring Plane Radius (km)


BET LIB Rev 187 Ingress
Radial Resolution (m)
0
-2
-4
-6
-8
125000
130000
135000
140000
145000
Ring Plane Radius (km)


HSP Counts (per second)
2000
1500
1000
500
0
125000
130000
135000
140000
145000
Ring Plane Radius (km)


ϕ (degrees)
300
290
280
270
260
125000
130000
135000
140000
145000
Ring Plane Radius (km)

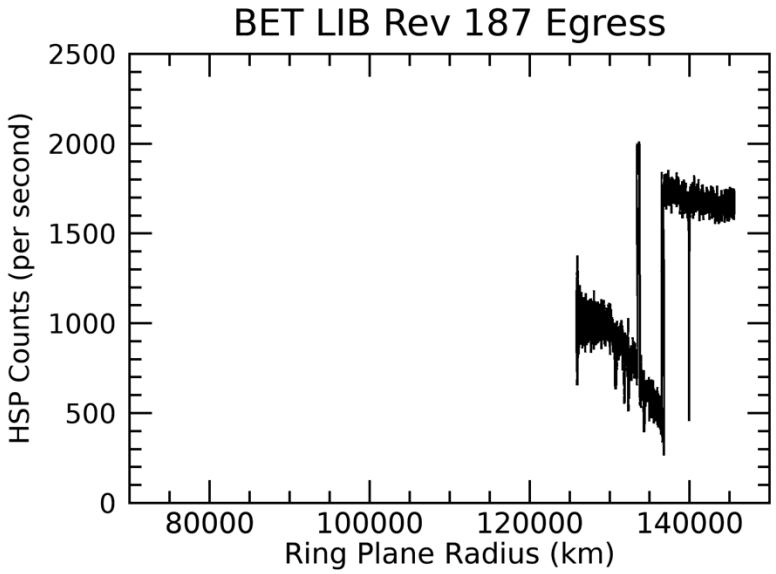


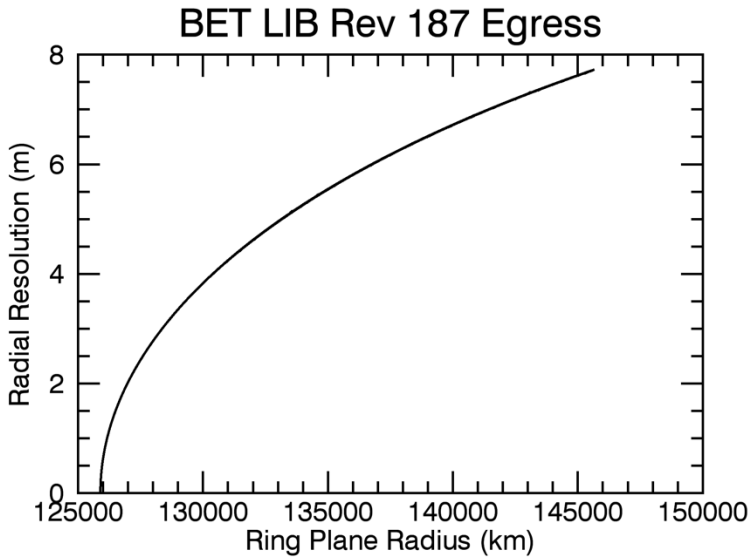
2013-114T02:06:00.000 1006090.9 km

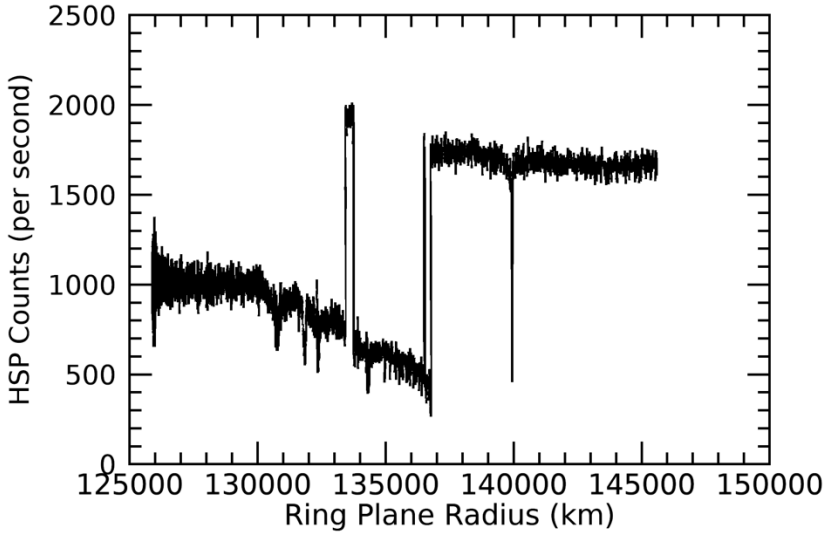
Target RA/dec: 221.77, -9.50

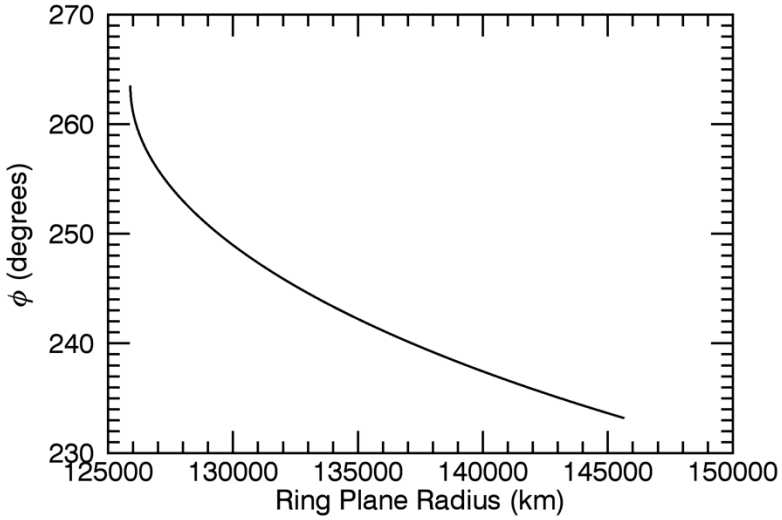
Subsolar lat/lon: 15.06, 120.61

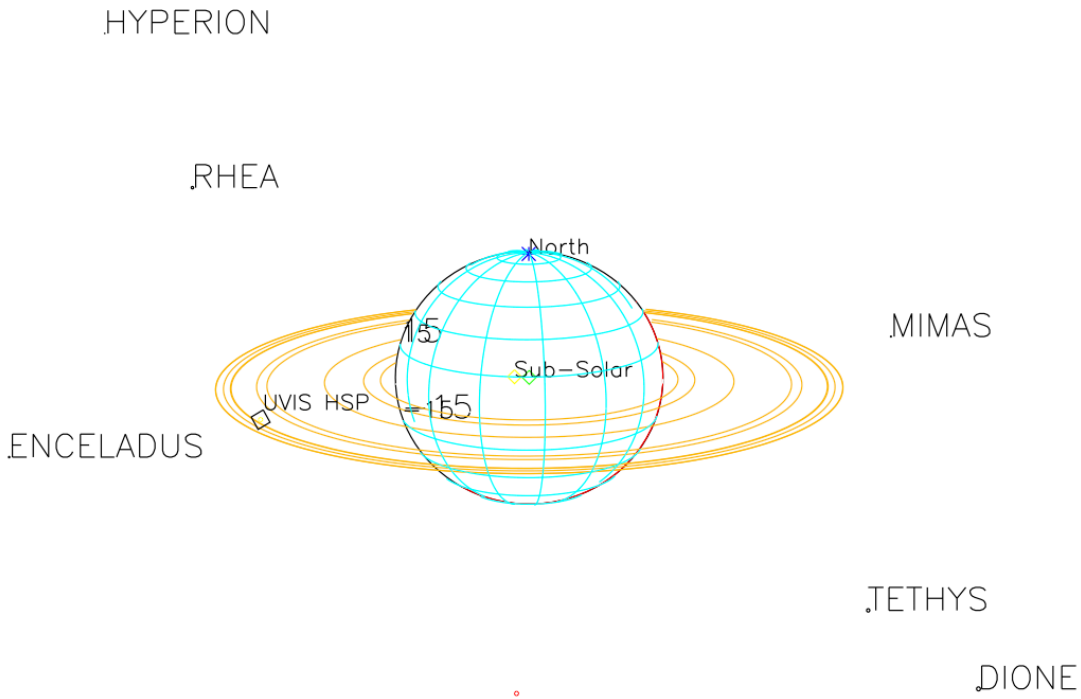
Sub-s/c lat/lon: 13.24, 126.22


BET LIB Rev 187 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
500
1000
1500
2000
2500
80000
100000
120000
140000


BET LIB Rev 187 Egress
Radial Resolution (m)
Ring Plane Radius (km)
0
2
4
6
8
125000
130000
135000
140000
145000
150000


HSP Counts (per second)
Ring Plane Radius (km)
0
500
1000
1500
2000
2500
125000
130000
135000
140000
145000
150000


ϕ (degrees)
Ring Plane Radius (km)
230
240
250
260
270
125000
130000
135000
140000
145000
150000

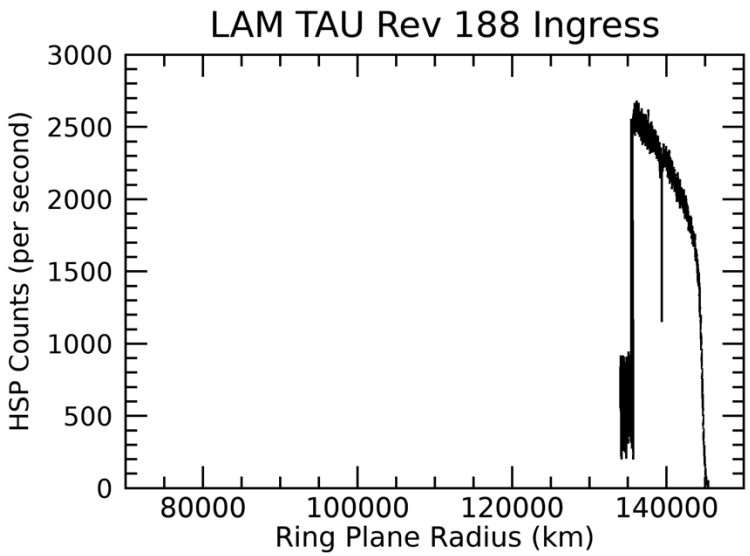


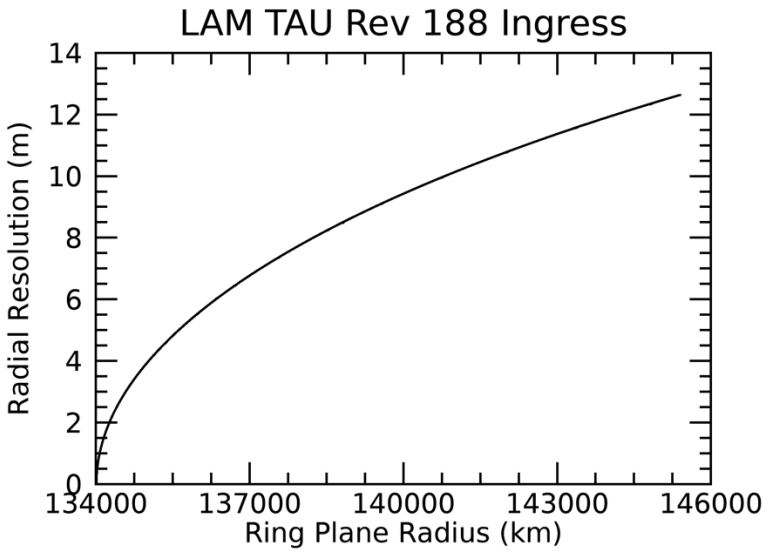
2013-114T03:24:00.000 1020462.2 km

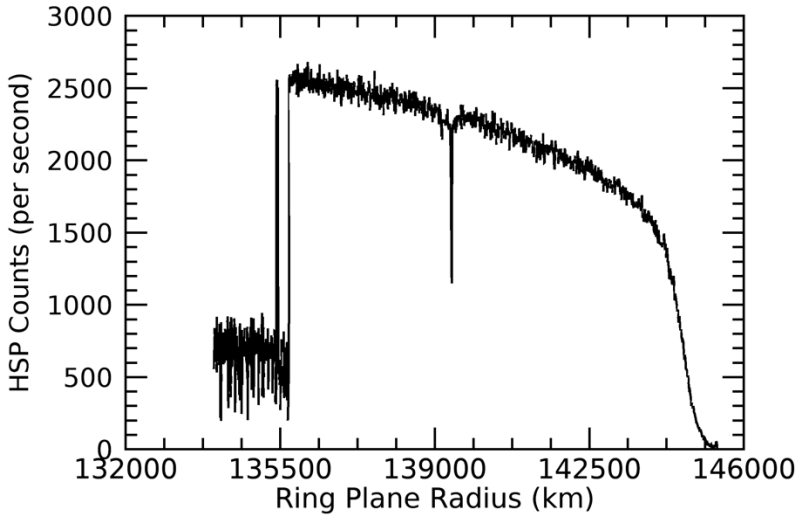
Target RA/dec: 222.39, -8.43

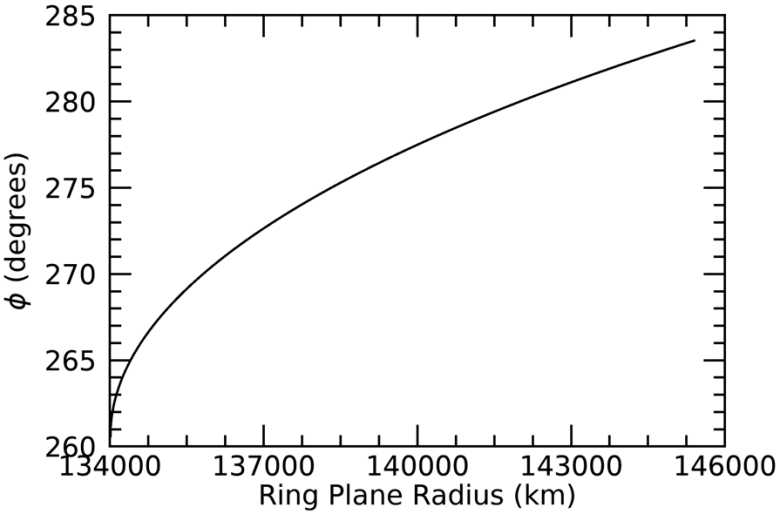
Subsolar lat/lon: 15.06, 76.69

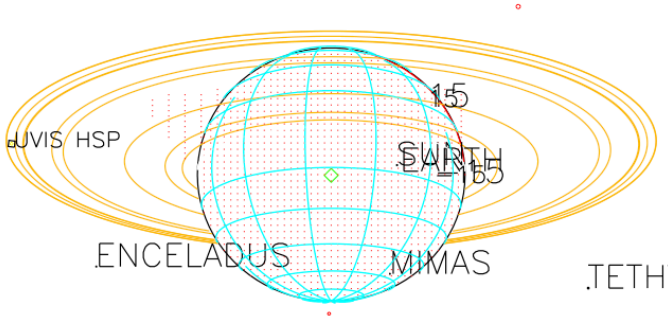
Sub-s/c lat/lon: 12.34, 82.93


LAM TAU Rev 188 Ingress
HSP Counts (per second)
Ring Plane Radius (km)
3000
2500
2000
1500
1000
500
0
80000
100000
120000
140000


LAM TAU Rev 188 Ingress
Radial Resolution (m)
Ring Plane Radius (km)
14
12
10
8
6
4
2
0
134000
137000
140000
143000
146000


HSP Counts (per second)
Ring Plane Radius (km)
3000
2500
2000
1500
1000
500
0
132000
135500
139000
142500
146000


ϕ (degrees)
Ring Plane Radius (km)
285
280
275
270
265
260
134000
137000
140000
143000
146000

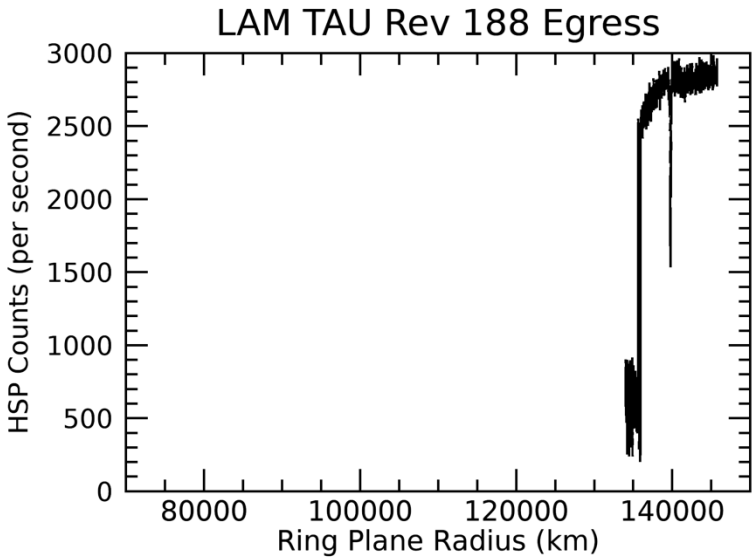


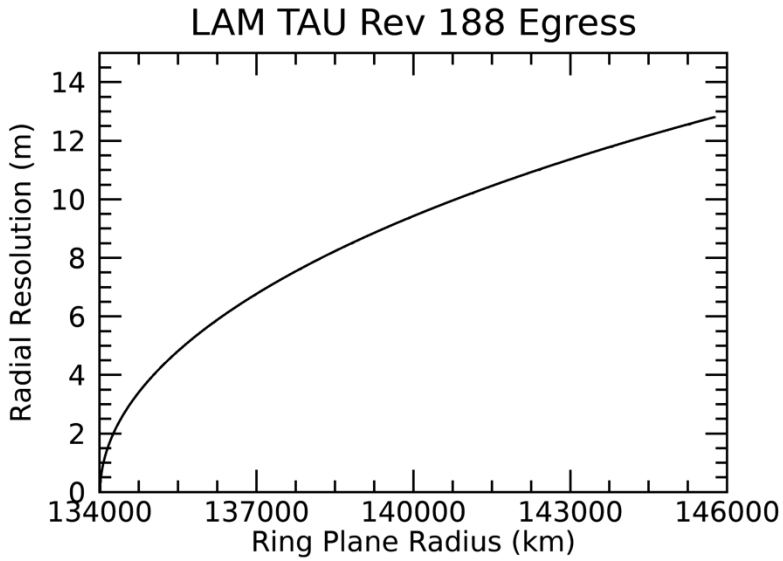
2013-121T08:52:00.000 421972.34 km

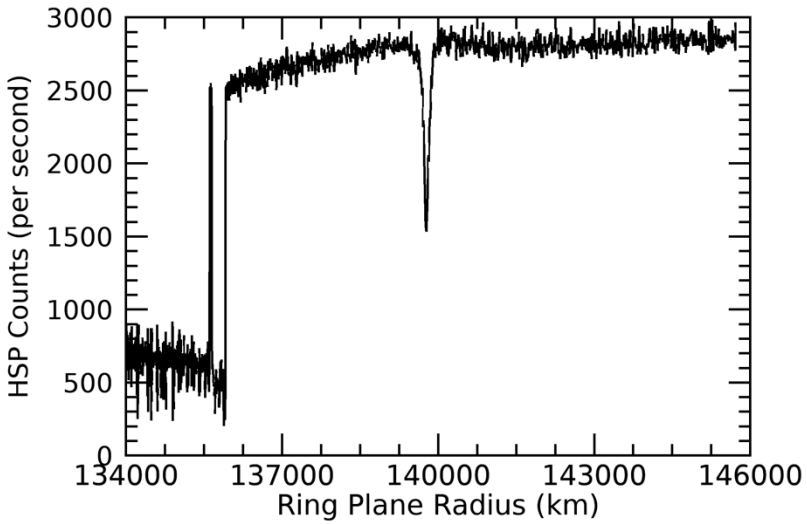
Target RA/dec: 40.69, 11.36

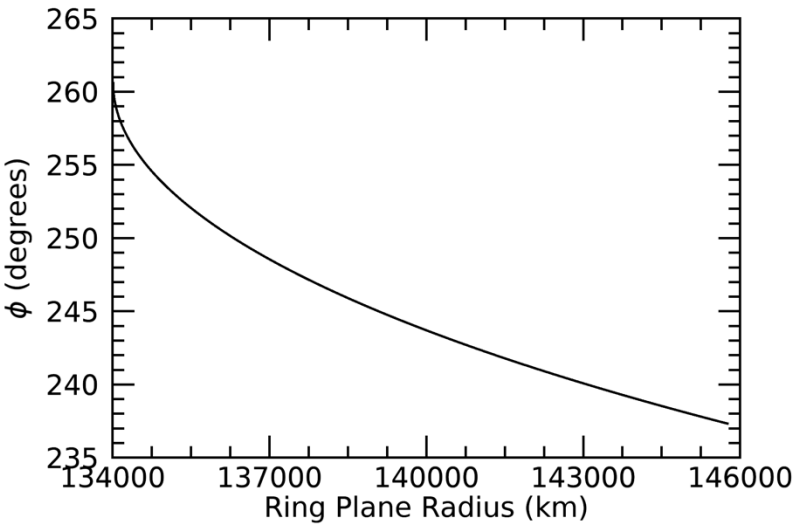
Subsolar lat/lon: 15.13, -23.34

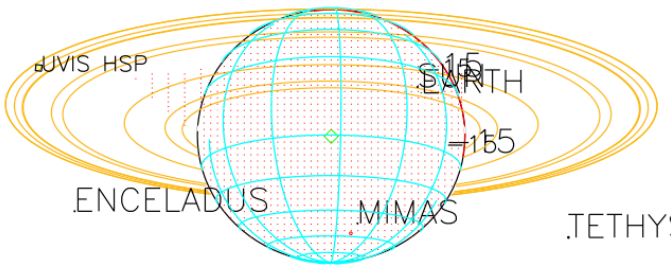
[illegible] km


LAM TAU Rev 188 Egress
HSP Counts (per second)
Ring Plane Radius (km)
0
500
1000
1500
2000
2500
3000
80000
100000
120000
140000


LAM TAU Rev 188 Egress
Radial Resolution (m)
Ring Plane Radius (km)
0
2
4
6
8
10
12
14
134000
137000
140000
143000
146000


HSP Counts (per second)
Ring Plane Radius (km)
0
500
1000
1500
2000
2500
3000
134000
137000
140000
143000
146000


ϕ (degrees)
Ring Plane Radius (km)
235
240
245
250
255
260
265
134000
137000
140000
143000
146000

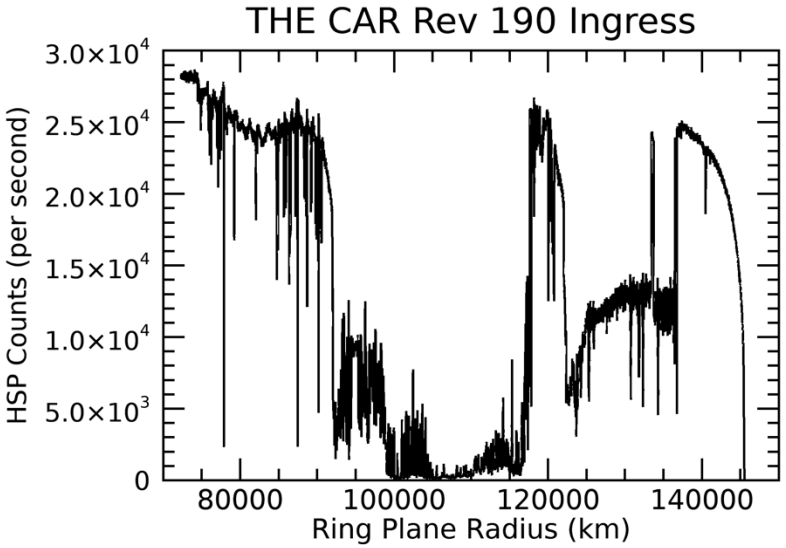


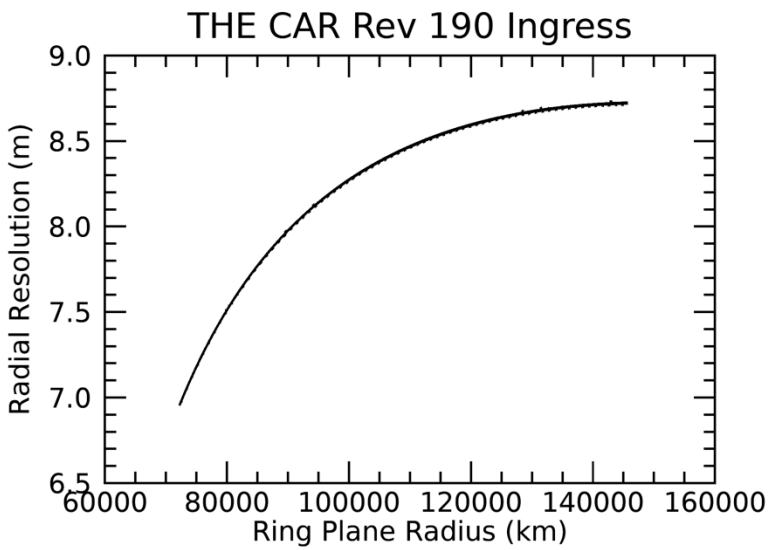
2013-121T09:21:00.000 416485.65 km

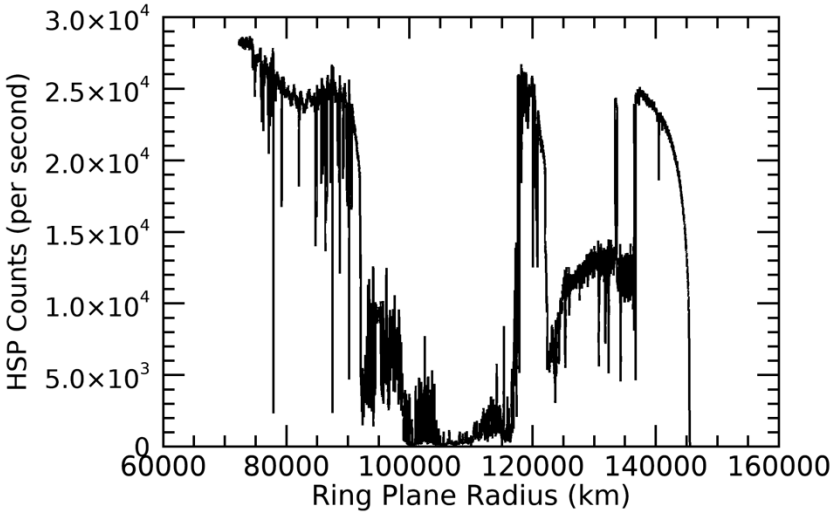
Target RA/dec: 42.05, 9.03

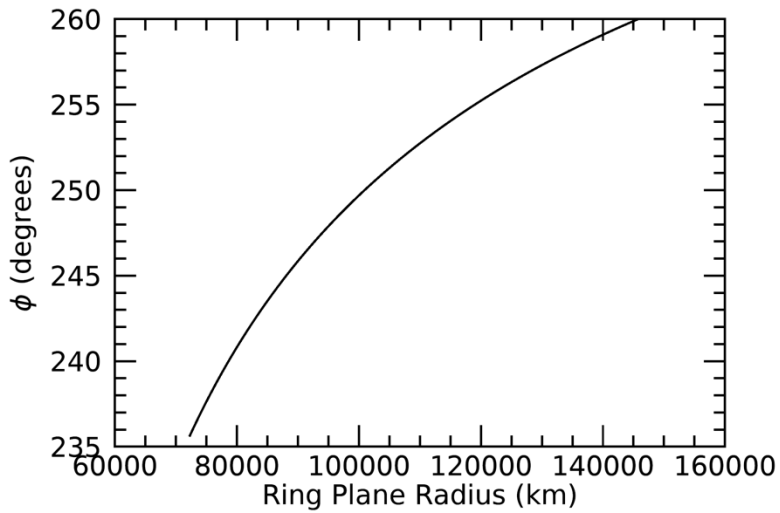
Subsolar lat/lon: 15.13, -39.66

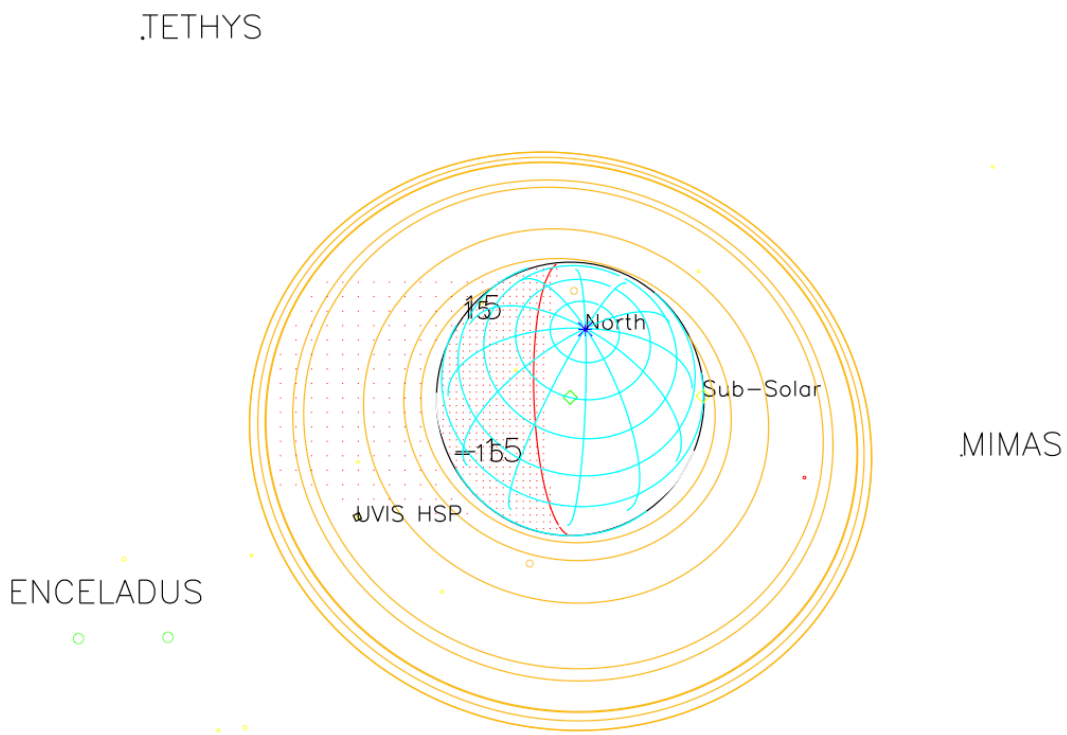
Sub-s/c lat/lon: -13.05, 146.00


THE CAR Rev 190 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)


THE CAR Rev 190 Ingress
Radial Resolution (m)
9.0
8.5
8.0
7.5
7.0
6.5
60000
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
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
260
255
250
245
240
235
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

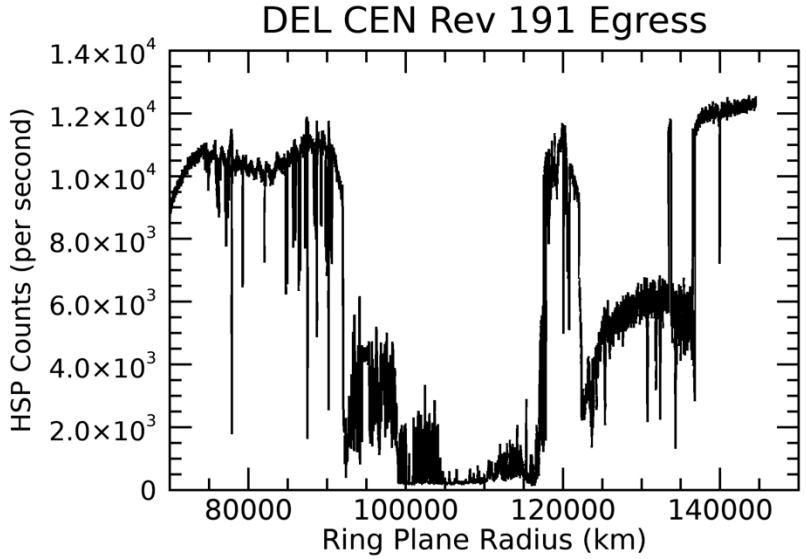


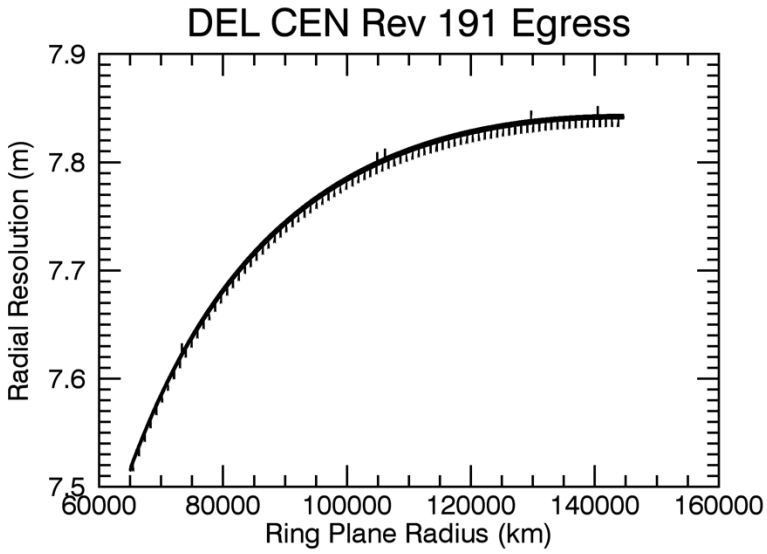
2013−141T04:21:00.000 444967.35 km

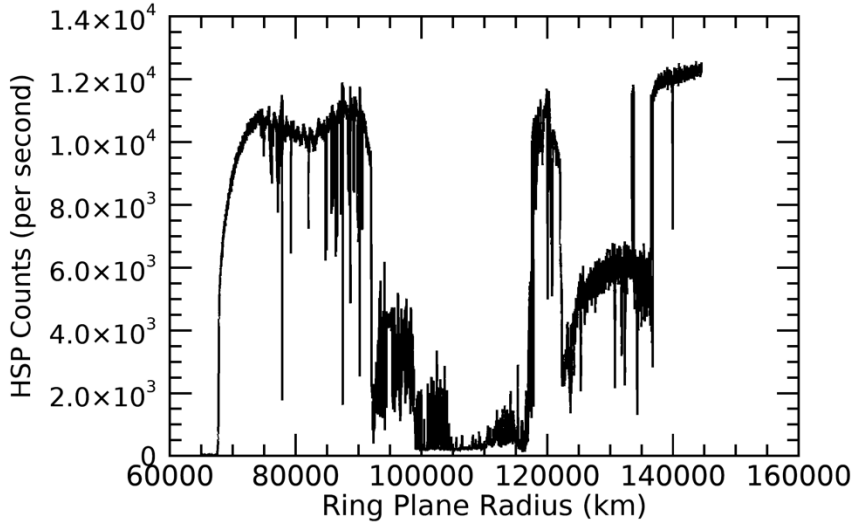
Target RA/dec: 131.55, −60.63

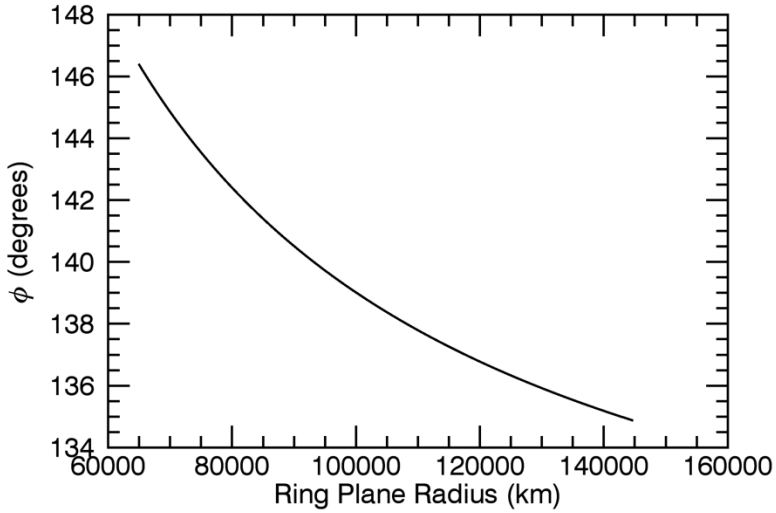
Subsolar lat/lon: 15.30, 113.99

Sub−s/c lat/lon: 55.48, 17.16


DEL CEN Rev 191 Egress
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 CEN Rev 191 Egress
Radial Resolution (m)
7.9
7.8
7.7
7.6
7.5
60000
80000
100000
120000
140000
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
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)


ϕ (degrees)
148
146
144
142
140
138
136
134
60000
80000
100000
120000
140000
160000
Ring Plane Radius (km)

DIONE

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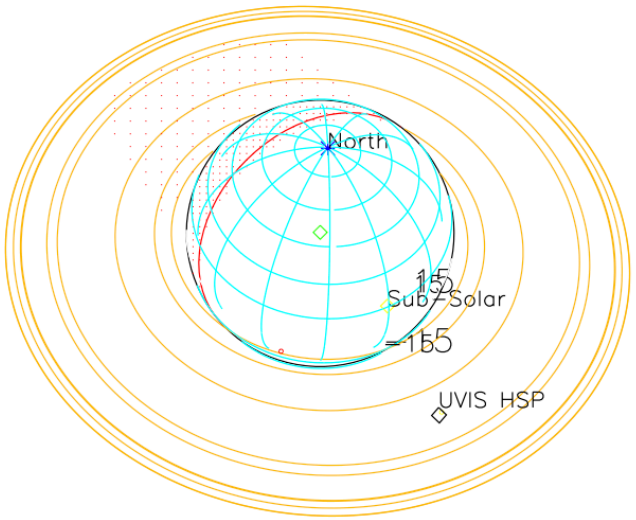


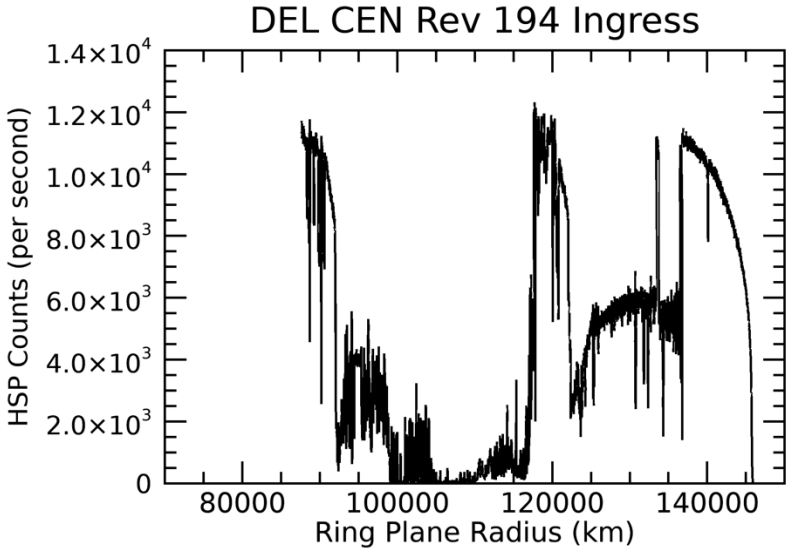
MIMAS

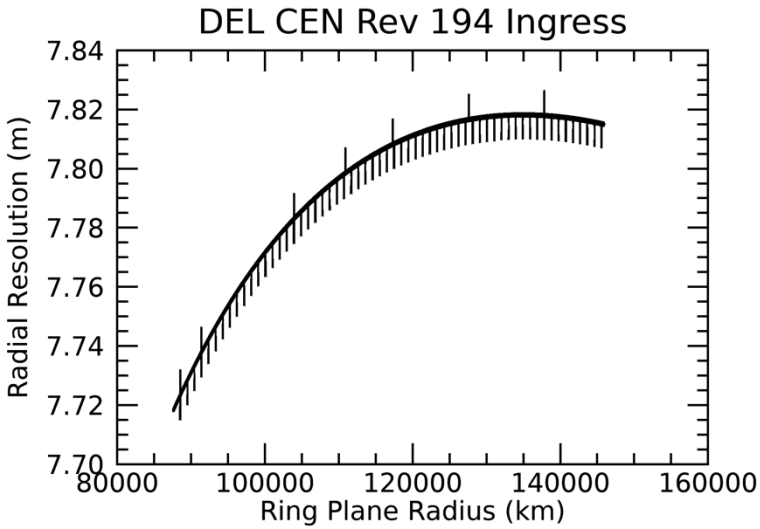
2013-153T12:00:00.000 780958.06 km

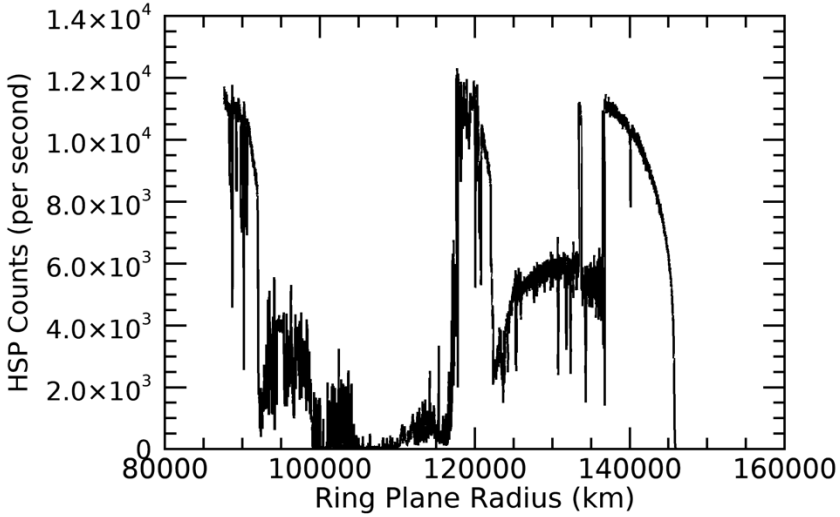
Target RA/dec: 188.41, -45.21

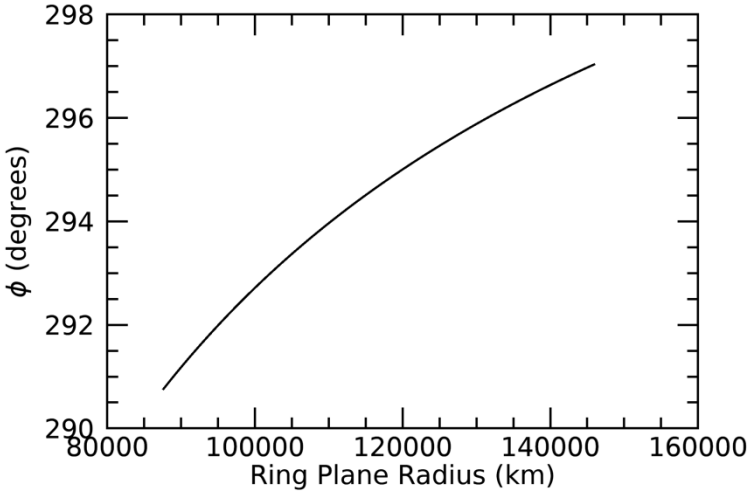
Subsolar lat/lon: 15.41, -153.58

Sub-s/c lat/lon: 45.13, 173.39


DEL CEN Rev 194 Ingress
HSP Counts (per second)
Ring Plane Radius (km)

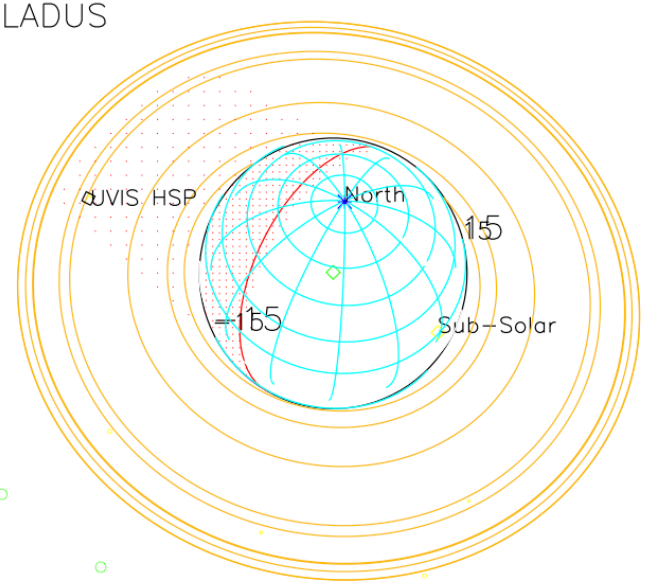

DEL CEN Rev 194 Ingress
Radial Resolution (m)
Ring Plane Radius (km)


HSP Counts (per second)
Ring Plane Radius (km)


ϕ (degrees)
Ring Plane Radius (km)

DIONE

ENCELADUS



MIMAS

2013-189T01:37:00.000 716503.26 km

Target RA/dec: 168.25, -54.21

TETHYS

Subsolar lat/lon: 15.72, 169.73

Sub-s/c lat/lon: 52.73, 111.46