V&V Reference Report
L2 ASCDS Version : 10.7.1

Observation 22219 - L2 Version 1
Chandra X-Ray Center

L2 Processing Date : May 19 2019

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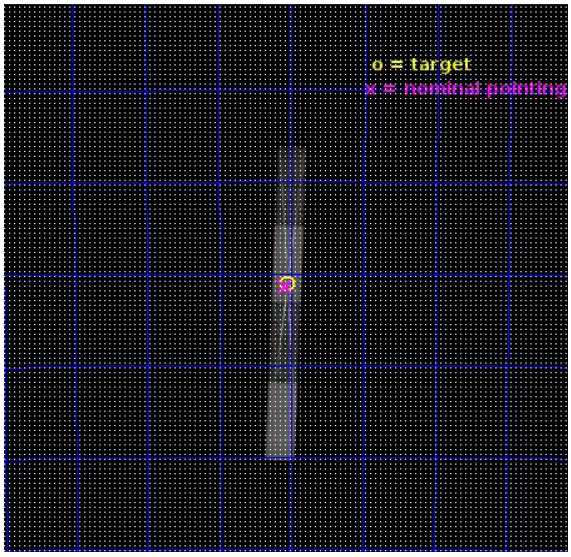
1 Front

seq_num	201231	Sequence number
obs_id	22219	Observation id
title	Eta Carinae: X-ray Emission Line Diagnostics On the Approach to Periastron Passage	Proposal title
observer	Michael Corcoran	Principal investigator
object	Eta Carinae	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	161.264583	Observer's specified target RA [deg]
dec_targ	-59.684444	Observer's specified target Dec [deg]
ra_nom	161.27085746729	Nominal RA [deg]
dec_nom	-59.690442274785	Nominal Dec [deg]
roll_nom	272.16203205866	Nominal Roll [deg]
revision	1	Processing version of data
ontime	35020.801391602	Sum of GTIs [s]
livetime	33862.697149102	Livetime [s]
ontime5	35020.801391602	Sum of GTIs [s]
ontime6	35019.560351491	Sum of GTIs [s]
ontime7	35020.801391602	Sum of GTIs [s]
ontime8	35020.801391602	Sum of GTIs [s]
l2events	205823	Number of level 2 events

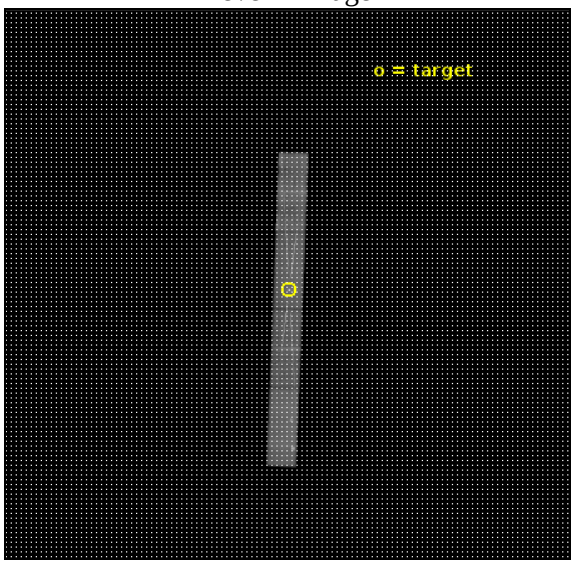


2 OBI

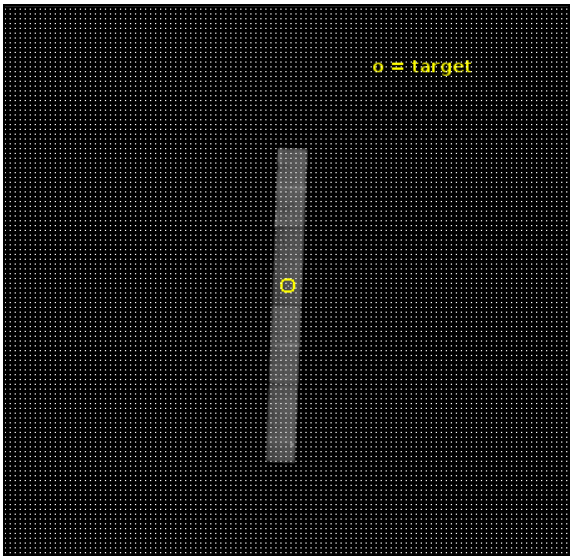
2.1 OBI

2.1.1 Images

Level 1 Image

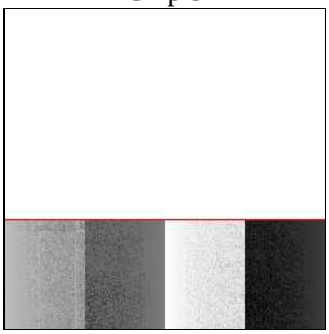


Level 1 Bad Events

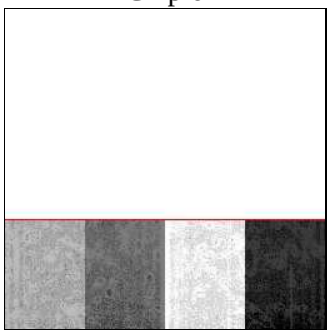


2.1.2 Bias

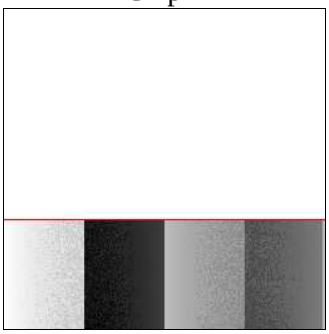
Chip 5



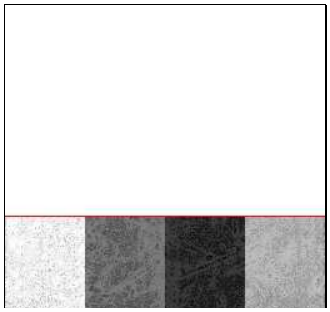
Chip 6



Chip 7



Chip 8



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.7.1	Processing system revision
caldbver	4.8.2	
date	2019-05-19T13:04:51	Date and time of file creation
revision	1	Processing version of data

sched_exp_time	35000.000000	[s] Scheduled observation exposure time
ontime	35020.801391602	Sum of GTIs [s]
ontime5	35020.801391602	Sum of GTIs [s]
ontime6	35019.560351491	Sum of GTIs [s]
ontime7	35020.801391602	Sum of GTIs [s]
ontime8	35020.801391602	Sum of GTIs [s]
l1events	579813	Number of level 1 events
tgmethod	FINDZO	Method used to create src1a file
zo_pos	(4118.24, 4139.20)	src1a sky pixel position
zo_pos_tgd	(4118.33, 4139.12)	src1a sky pixel position via tgdetect

2.1.4 Events

	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	155085	121922	167597	135209
rejected events	79349	91467	70682	96131
rejected %	51%	75%	42%	71%

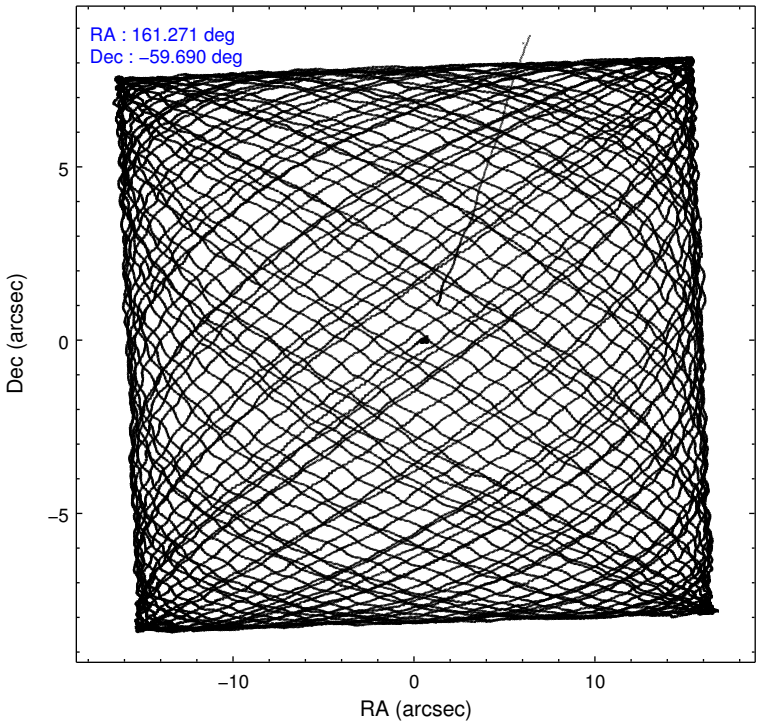
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	10099	17454	12533	12696
	6%	14%	7%	9%
grade 1 events	3556	82	546	78
	2%	0%	0%	0%
grade 2 events	20597	5128	20606	8444
	13%	4%	12%	6%
grade 3 events	3683	2291	9795	4085
	2%	1%	5%	3%
grade 4 events	3534	2287	9586	3841
	2%	1%	5%	2%
grade 5 events	10165	4013	13723	6182
	6%	3%	8%	4%
grade 6 events	38733	3544	45277	10395
	24%	2%	27%	7%
grade 7 events	64718	87123	55531	89488
	41%	71%	33%	66%

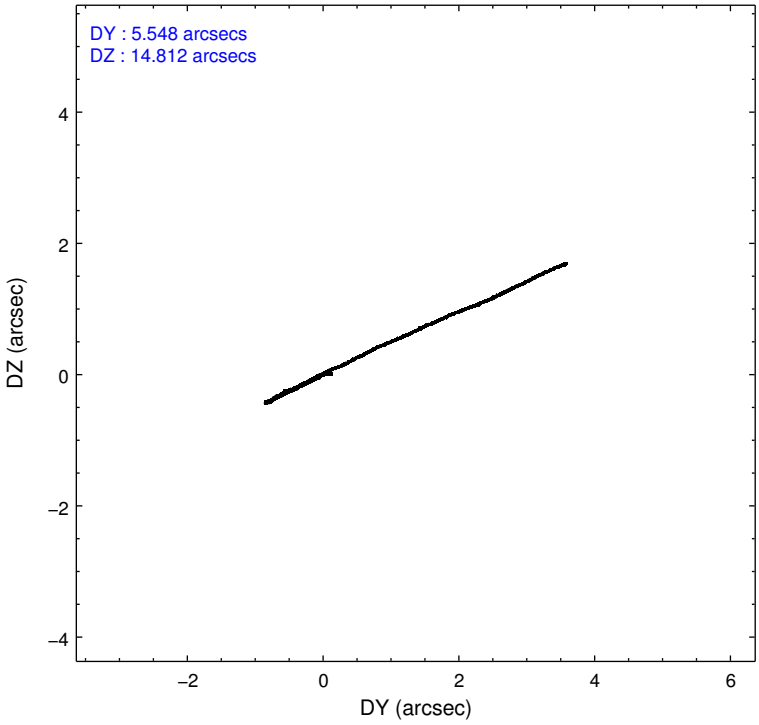
2.2 Compared Parameters

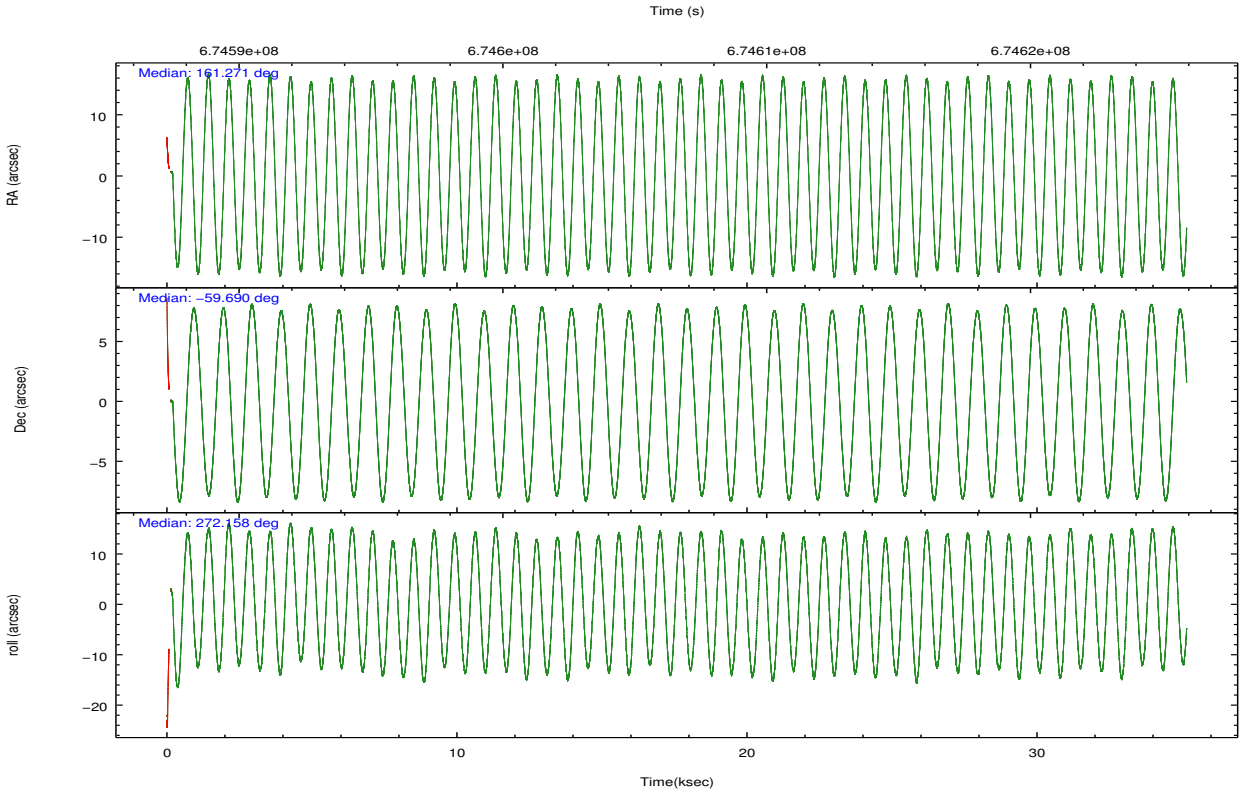
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-5678	ACIS-5678
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	161.241354	161.2708574672903
[deg] Pointing Dec	-59.667403	-59.6904422747846
[deg] Pointing Roll	271.979950	272.1620320586626
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-182.132523	-182.1370004450064
[mm] SIM translation stage offset	-8	-7.995522138001405
Phase constraints	Y	Y
[d] Phase period	2024.000000	2024.000000
[d] Phase epoch (MJD)	56871.291953	56871.291953
Phase start	0.797000	0.797000
Phase end	0.930000	0.930000
Phase start error	0.010000	0.010000
Phase end error	0.010000	0.010000
[s] Observation start time (MET)	674589156.184000	674588126.64881
Observation start date	2019-05-18T17:51:27	2019-05-18T17:35:26
[s] Observation end time (MET)	674624156.184000	674624783.21351
Observation end date	2019-05-19T03:34:47	2019-05-19T03:46:23
Read mode	TIMED	TIMED

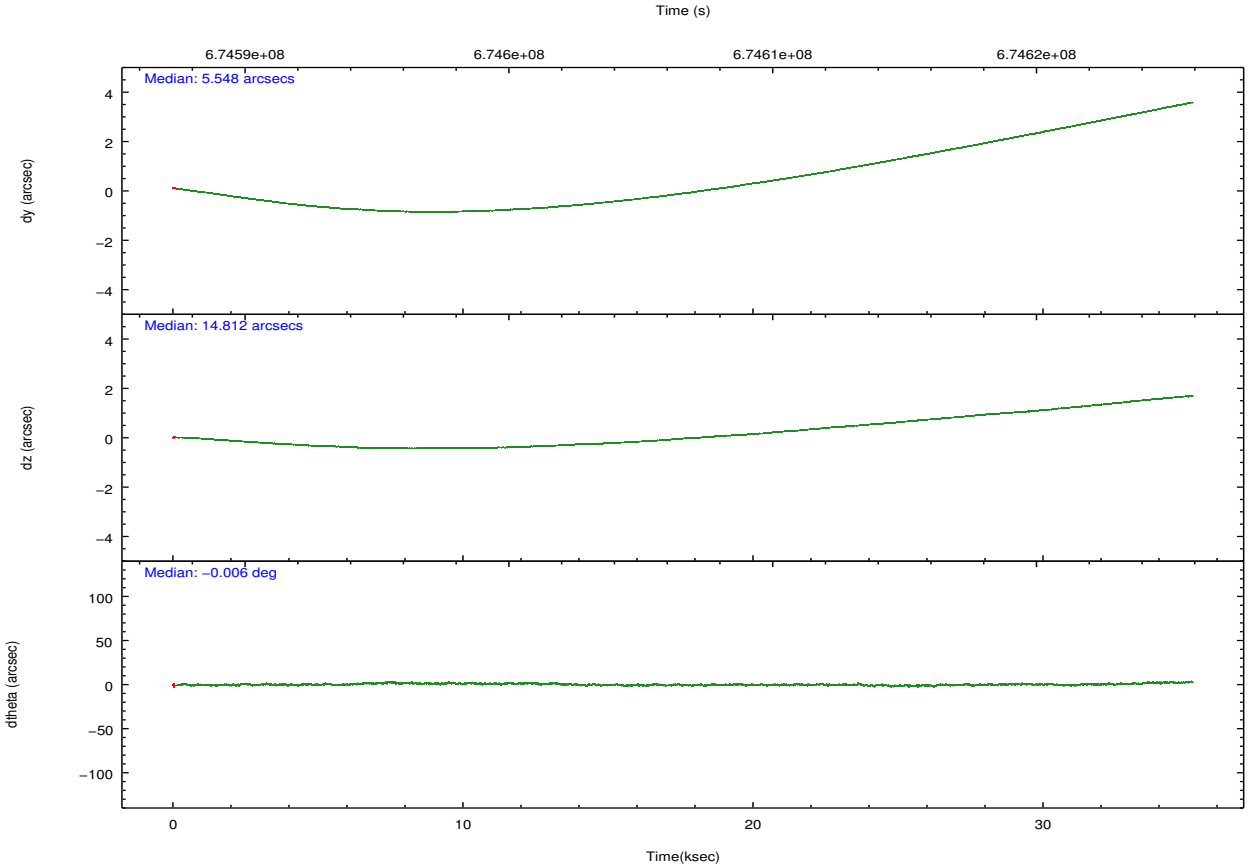
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	1	1
Subarray row count	350	350
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	1.2

2.3 Aspect


RA : 161.271 deg
Dec : −59.690 deg
Dec (arcsec)
RA (arcsec)
5
0
−5
−10
0
10


DY : 5.548 arcsecs
DZ : 14.812 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−2
0
2
4
6


Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: 161.271 deg
RA (arcsec)
Median: −59.690 deg
Dec (arcsec)
Median: 272.158 deg
roll (arcsec)
Time(ksec)

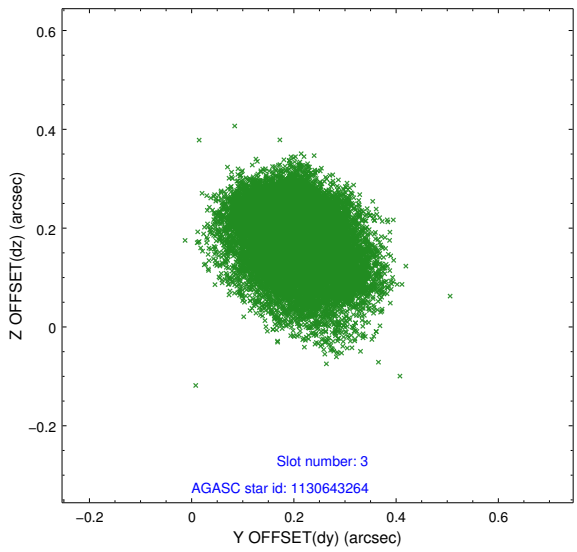

Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: 5.548 arcsecs
dy (arcsec)
Median: 14.812 arcsecs
dz (arcsec)
Median: −0.006 deg
dtheta (arcsec)
Time(ksec)

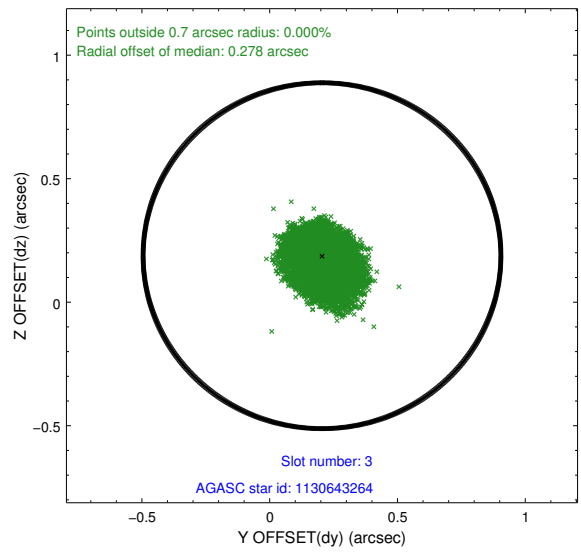
Slot Statistics

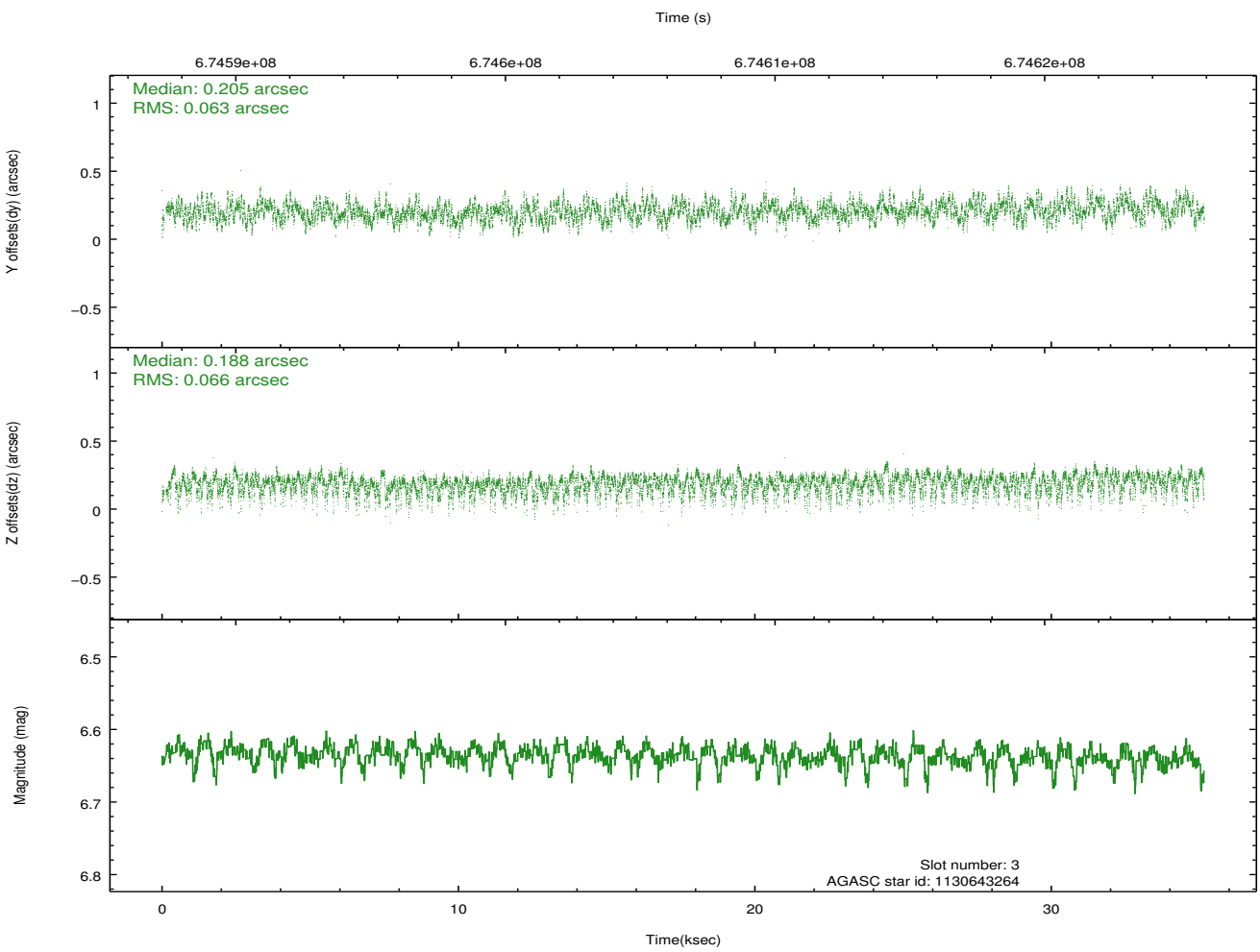
ot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-4	7.22	8560	1.000	0.478	-0.008	0.009	0.031	0.000000	0.000000	2155.58	7
1	FID		ACIS-S-5	7.27	8559	1.000	-0.562	-0.024	0.013	0.038	0.000000	0.000000	-1811.60	0
2	FID		ACIS-S-6	7.45	8556	1.000	0.054	0.046	0.011	0.018	0.000000	0.000000	403.36	644
3	GUIDE	used	1130643264	6.64	17119	1.000	0.205	0.188	0.096	0.159	160.322990	-59.676912	-11.31	-1669
4	GUIDE	used	1174020728	8.13	17117	1.000	-0.158	-0.276	0.096	0.149	162.364714	-60.294672	2343.07	1924
5	GUIDE	used	1130632200	7.54	17116	1.000	-0.042	0.065	0.080	0.141	161.433843	-59.407820	-920.91	384
6	GUIDE	used	1174033144	8.62	17111	1.000	-0.012	0.041	0.109	0.168	161.168741	-60.059230	1405.53	-178
7	MONITOR	unused		0.00	0	0.000	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0

2.4 Star Slots

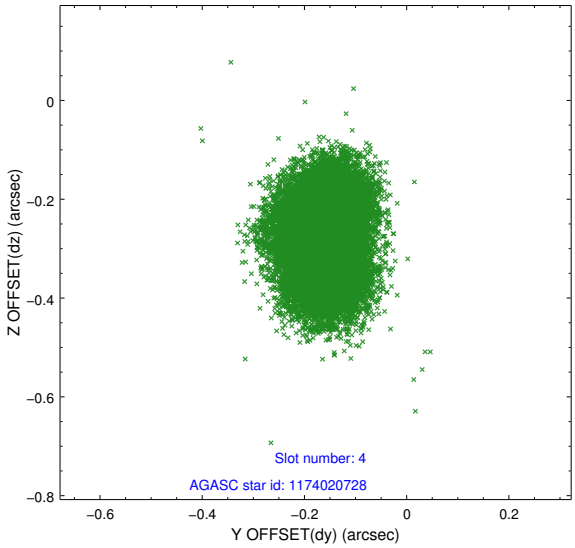
2.4.1 Slot 3

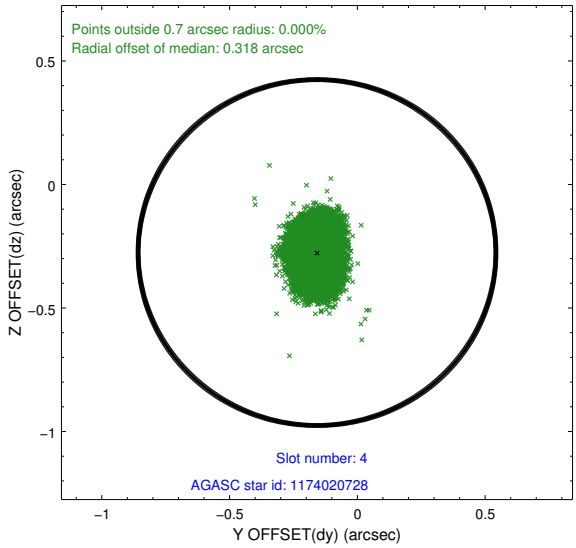


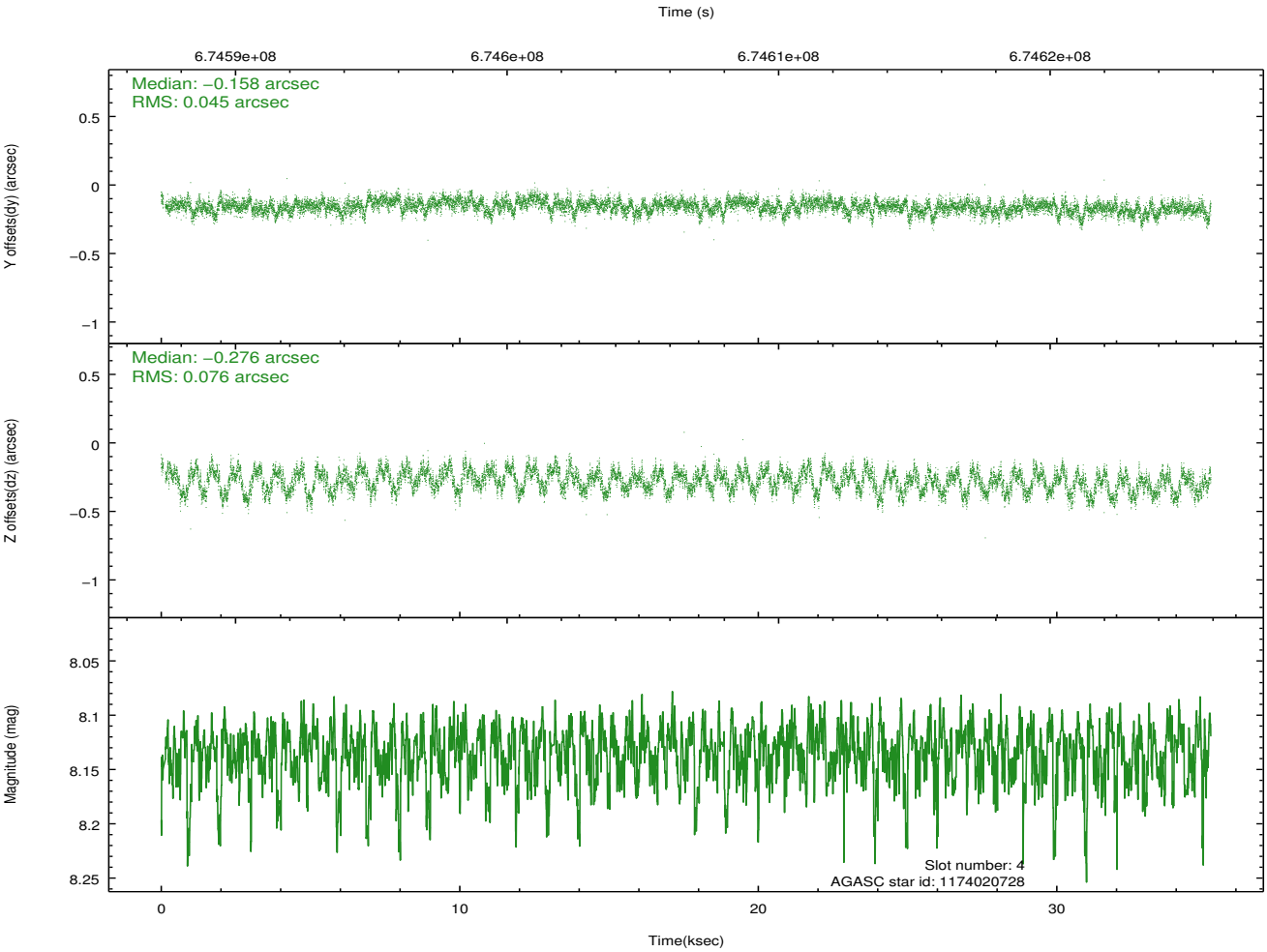




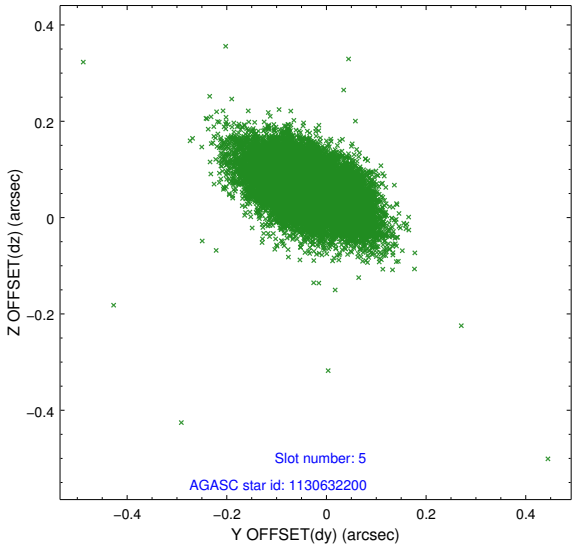
2.4.2 Slot 4

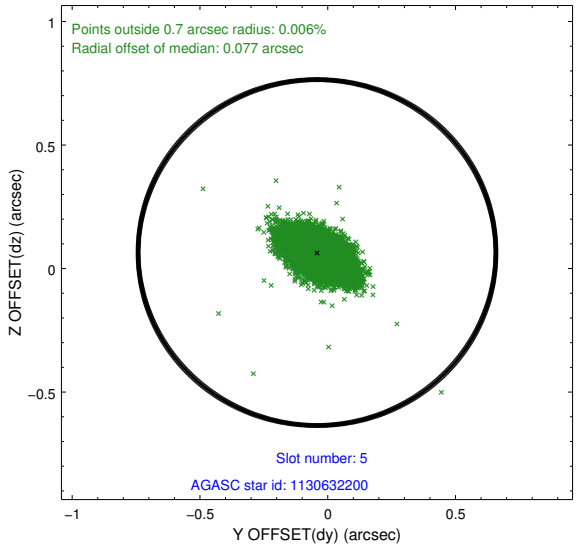

Slot number: 4
AGASC star id: 1174020728
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)

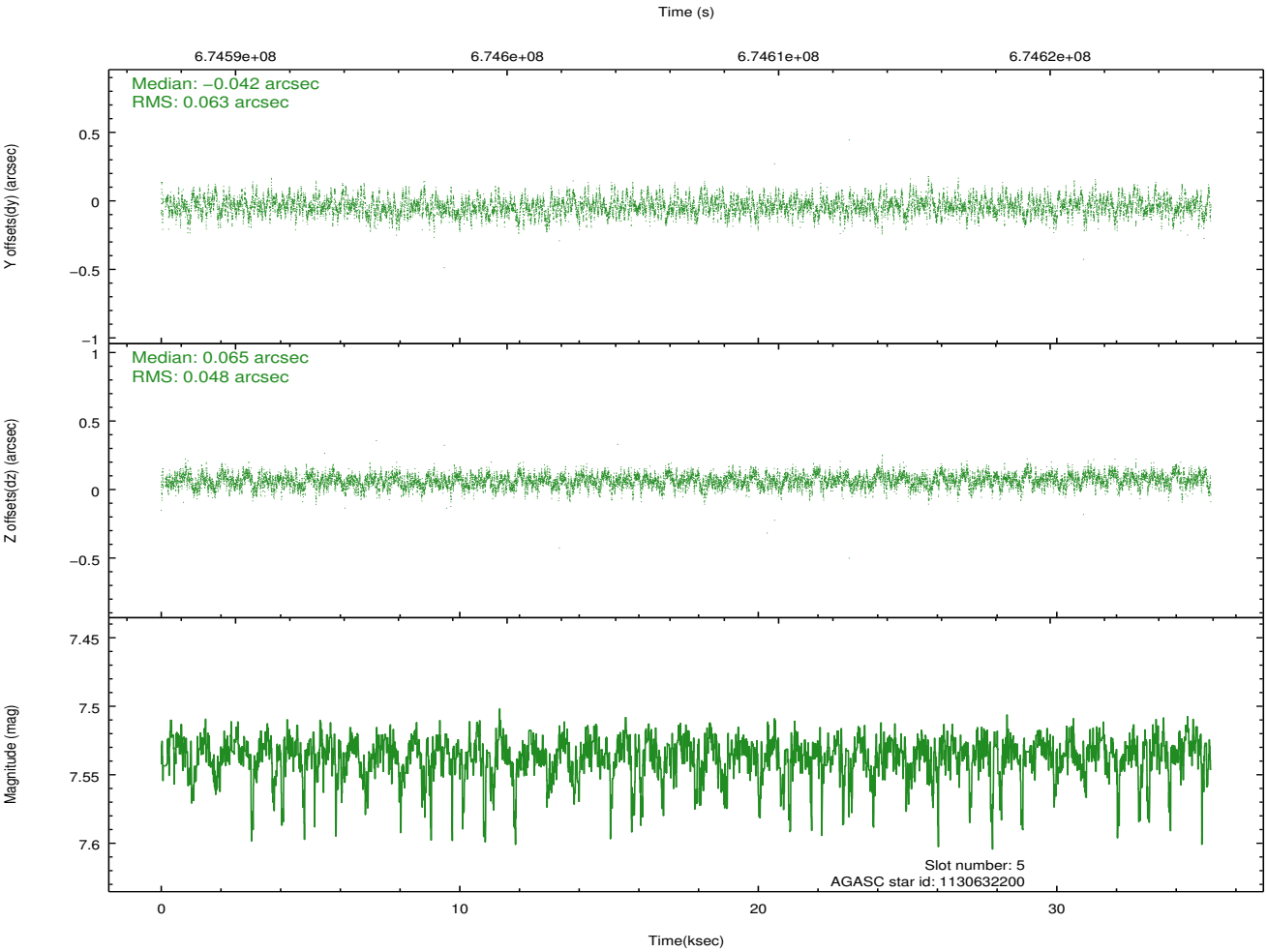

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.318 arcsec
Slot number: 4
AGASC star id: 1174020728
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)


Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: −0.158 arcsec
RMS: 0.045 arcsec
Y offsets(dy) (arcsec)
Median: −0.276 arcsec
RMS: 0.076 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 1174020728
Time(ksec)

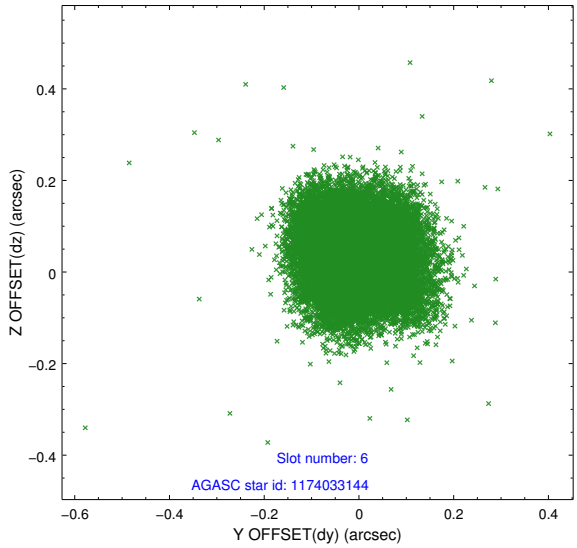
2.4.3 Slot 5

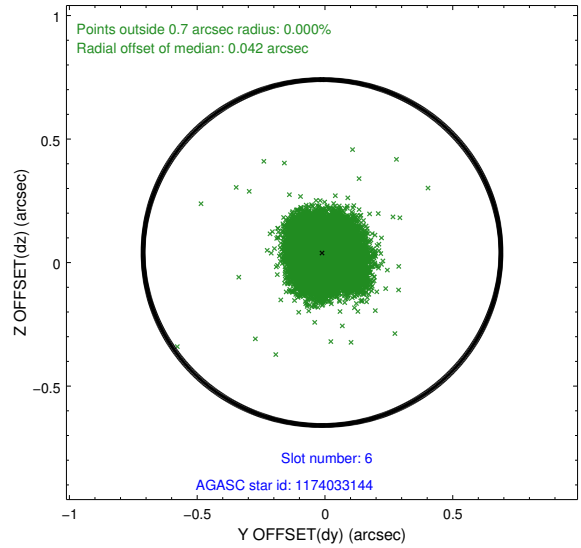

Slot number: 5
AGASC star id: 1130632200
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)

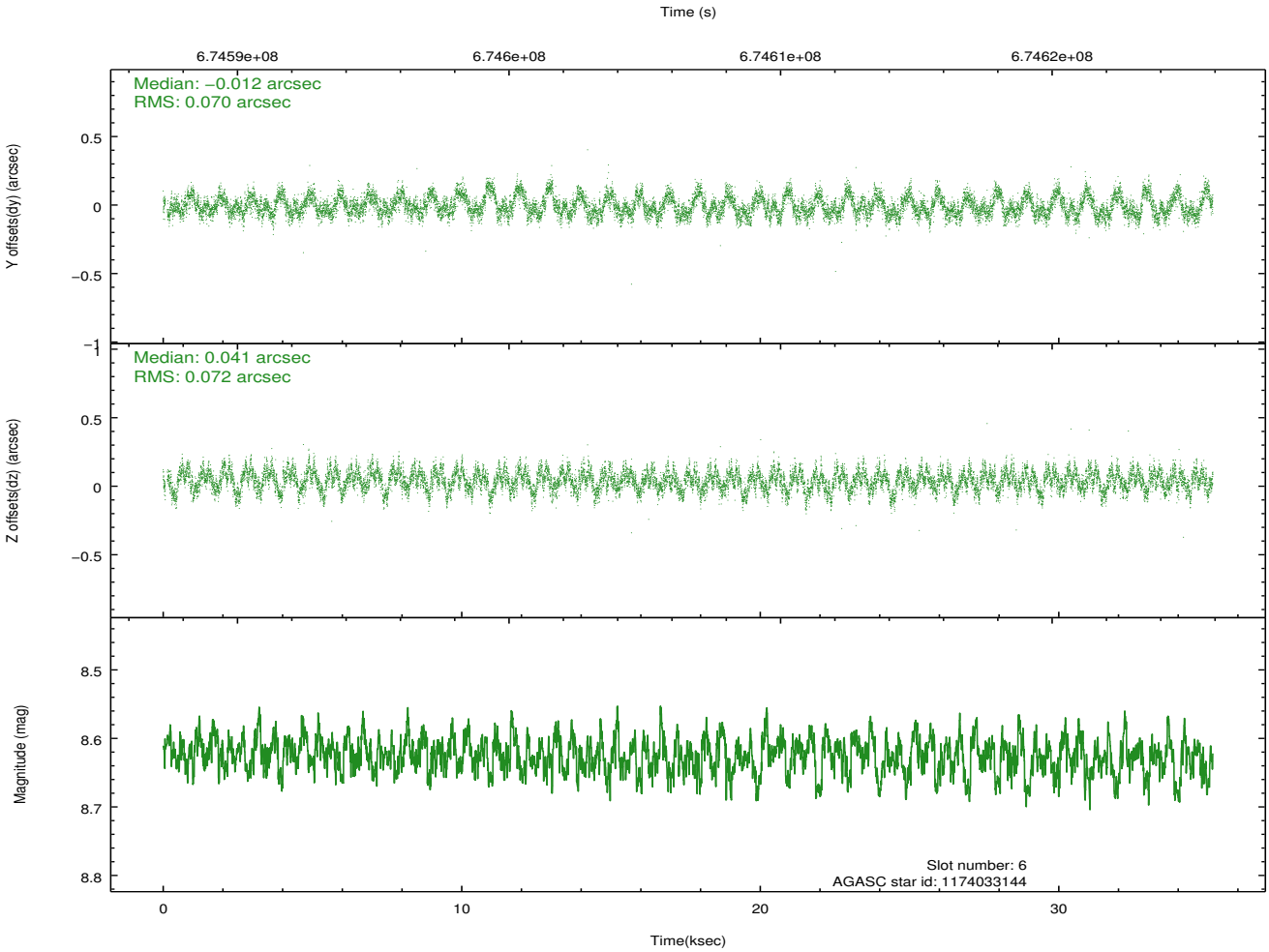

Points outside 0.7 arcsec radius: 0.006%
Radial offset of median: 0.077 arcsec
Slot number: 5
AGASC star id: 1130632200
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)


Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: −0.042 arcsec
RMS: 0.063 arcsec
Y offsets(dy) (arcsec)
Median: 0.065 arcsec
RMS: 0.048 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 1130632200
Time(ksec)

2.4.4 Slot 6

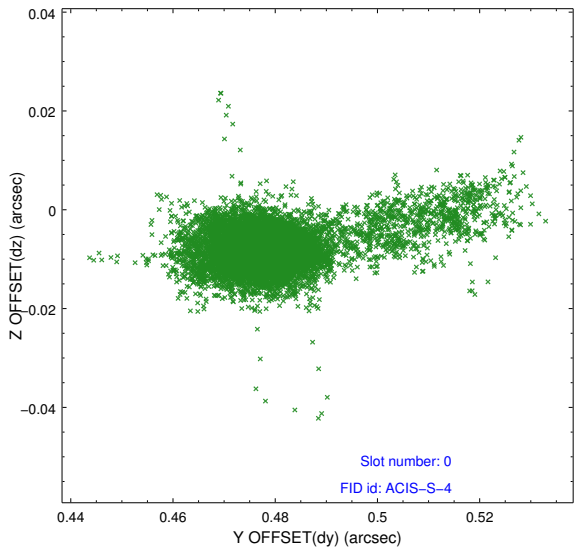

Slot number: 6
AGASC star id: 1174033144
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)

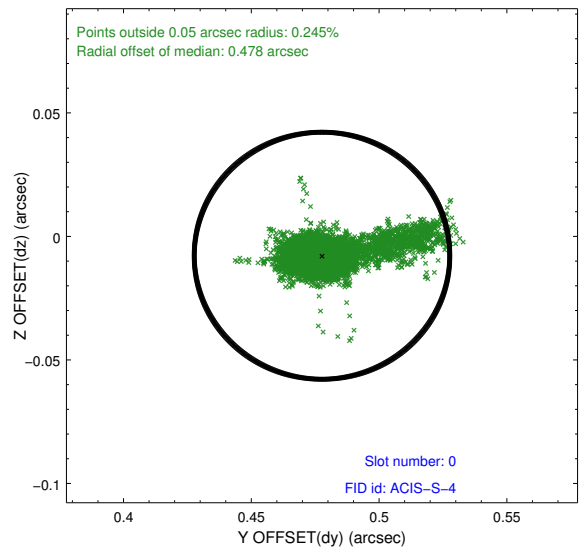

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.042 arcsec
Slot number: 6
AGASC star id: 1174033144
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)

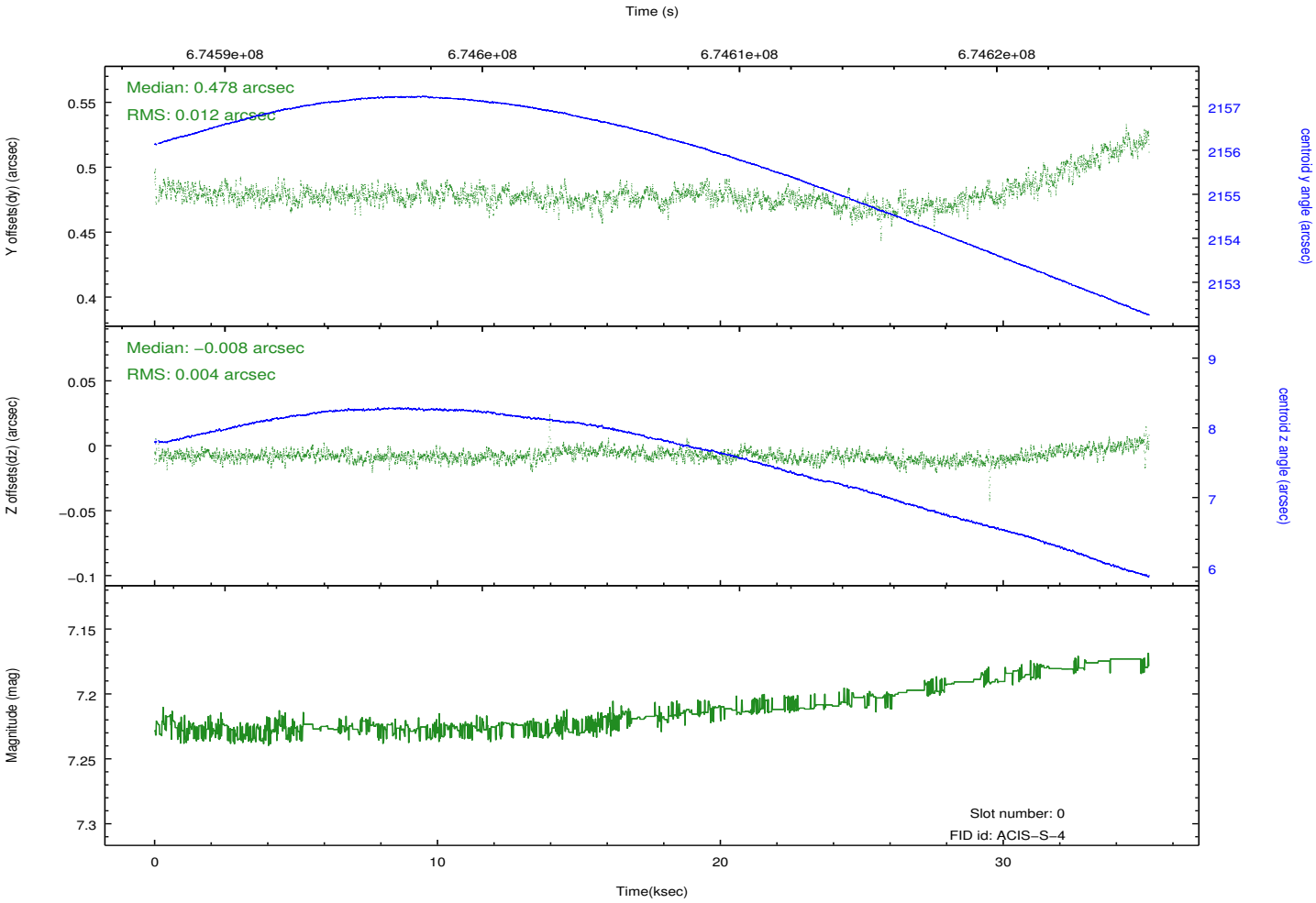

Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: −0.012 arcsec
RMS: 0.070 arcsec
Y offsets(dy) (arcsec)
Median: 0.041 arcsec
RMS: 0.072 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 1174033144
Time(ksec)

2.5 FID Slots

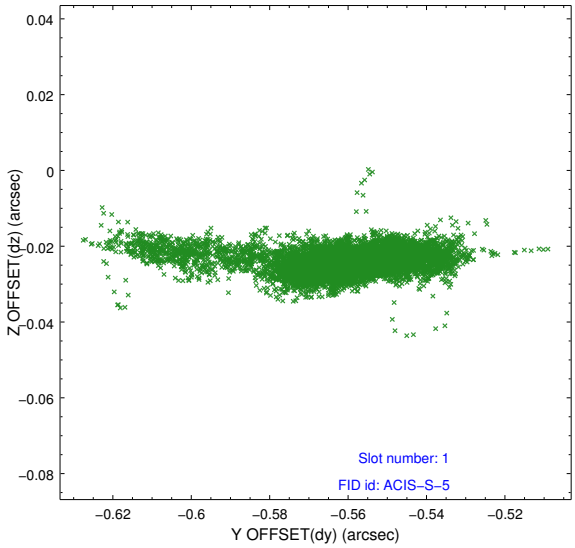
2.5.1 Slot 0

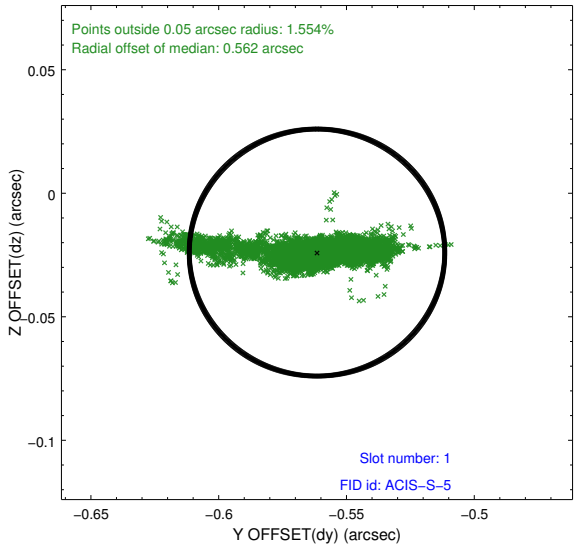


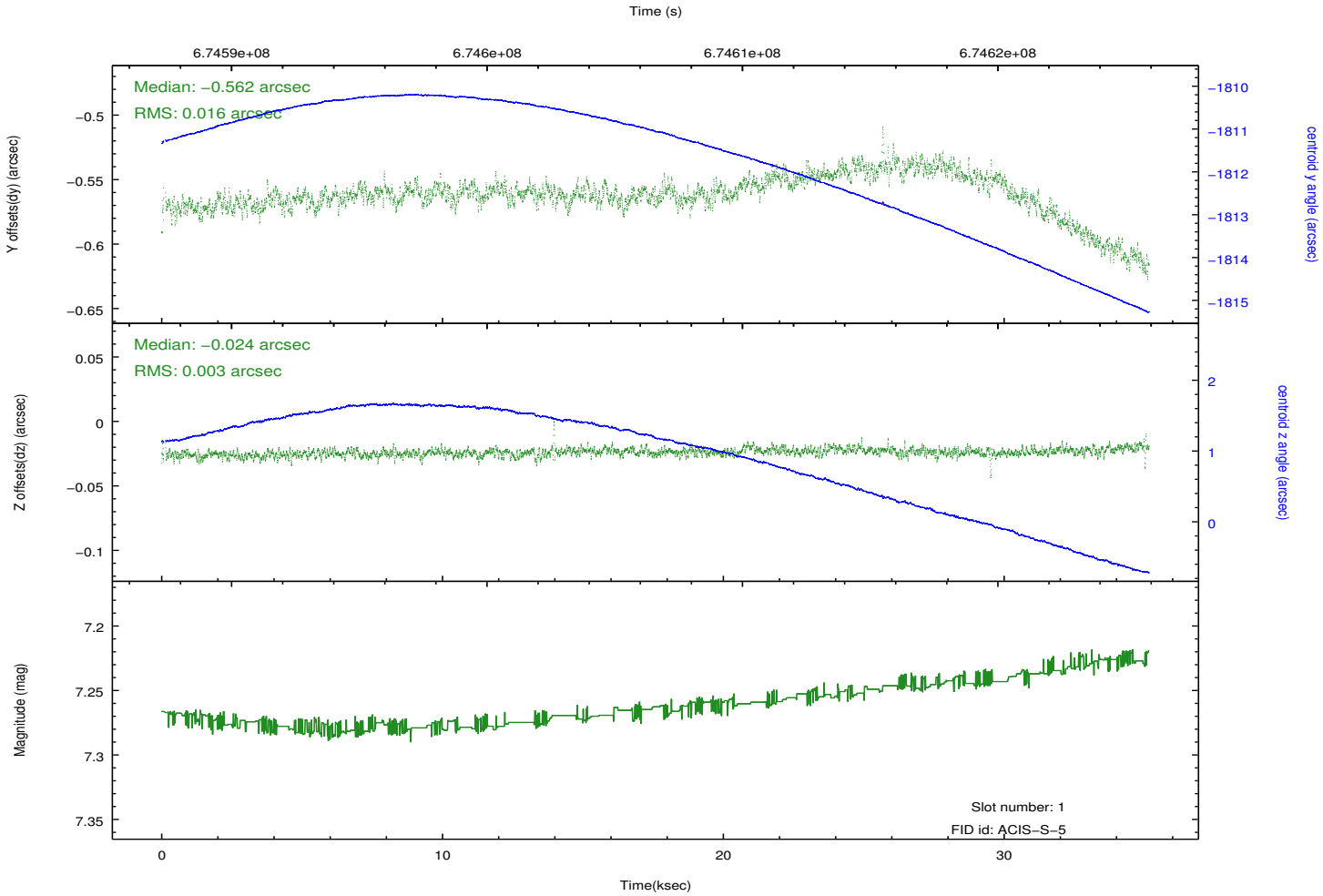




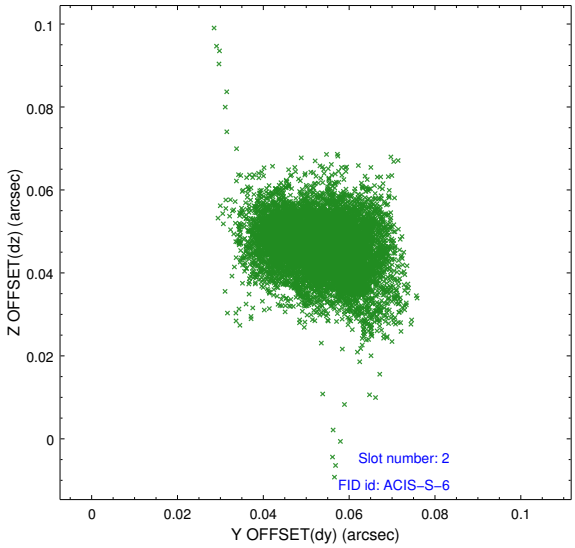
2.5.2 Slot 1

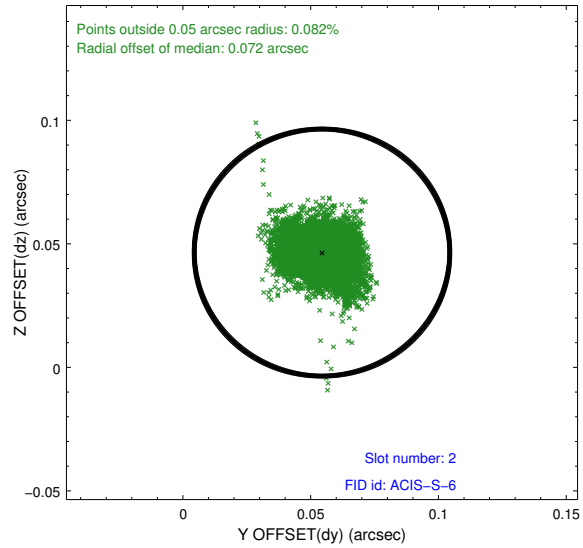

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−5

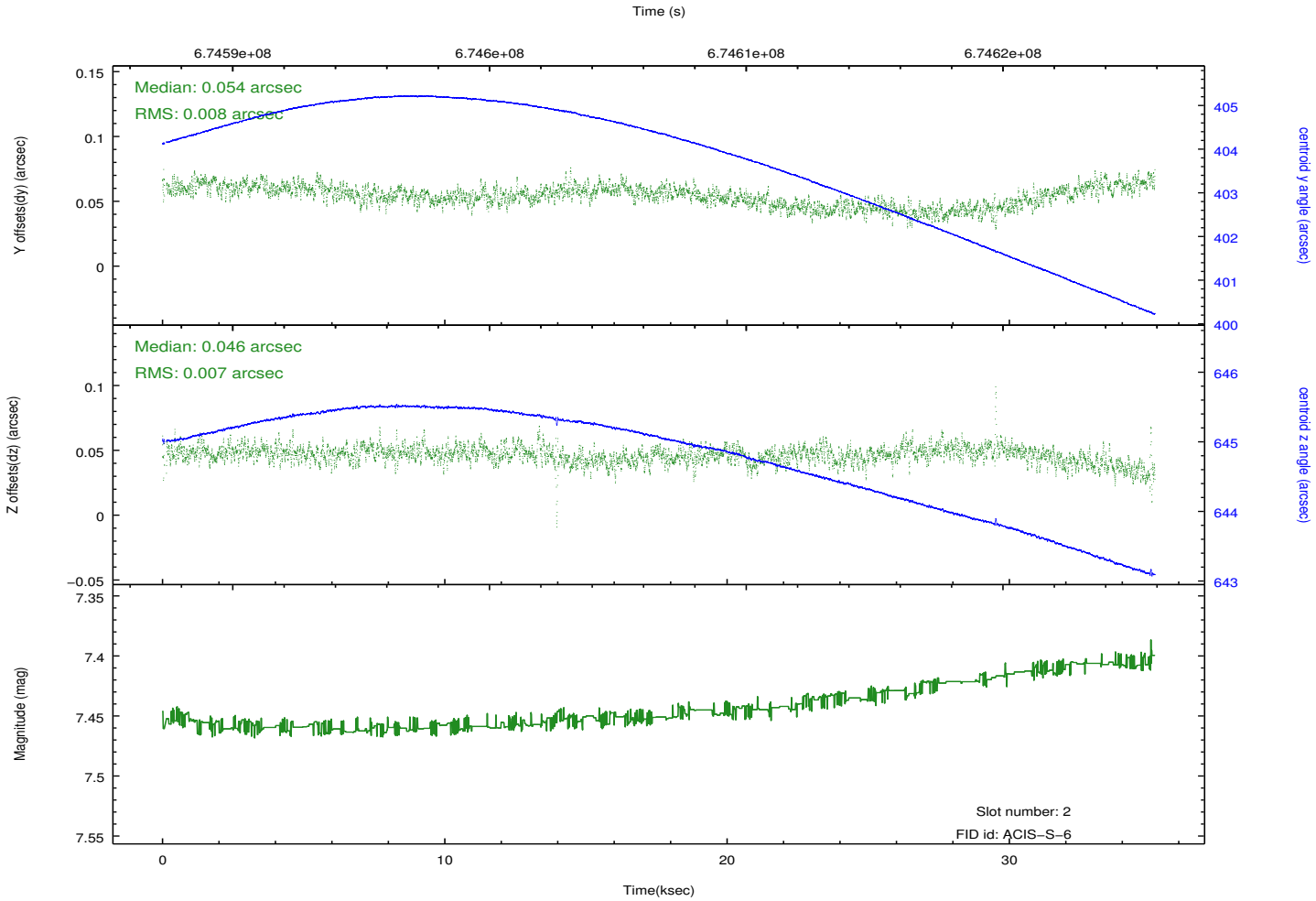

Points outside 0.05 arcsec radius: 1.554%
Radial offset of median: 0.562 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−5


Time (s)
Median: −0.562 arcsec
RMS: 0.016 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.024 arcsec
RMS: 0.003 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−S−5
Time(ksec)

2.5.3 Slot 2

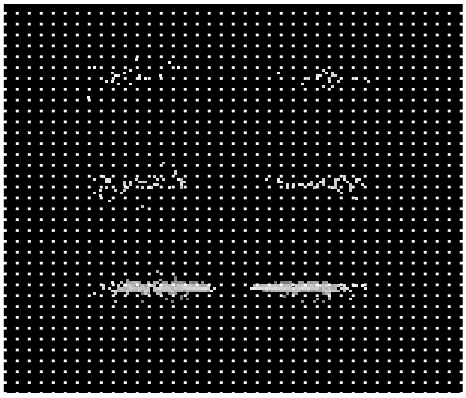

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−6


Points outside 0.05 arcsec radius: 0.082%
Radial offset of median: 0.072 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−6

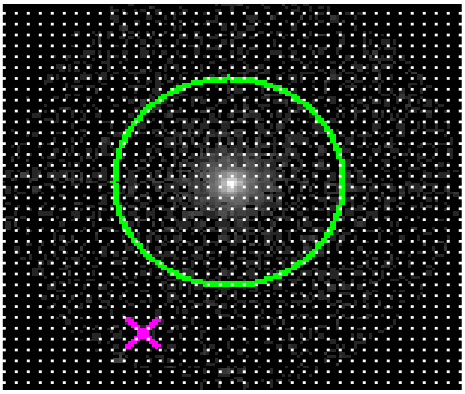

Time (s)
6.7459e+08
6.746e+08
6.7461e+08
6.7462e+08
Median: 0.054 arcsec
RMS: 0.008 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.046 arcsec
RMS: 0.007 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−6
Time(ksec)

3 Gratings

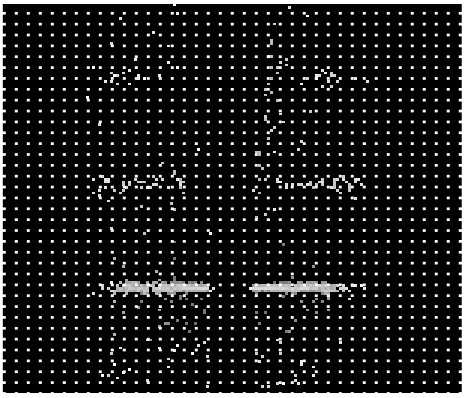
3.1 HEG Arm



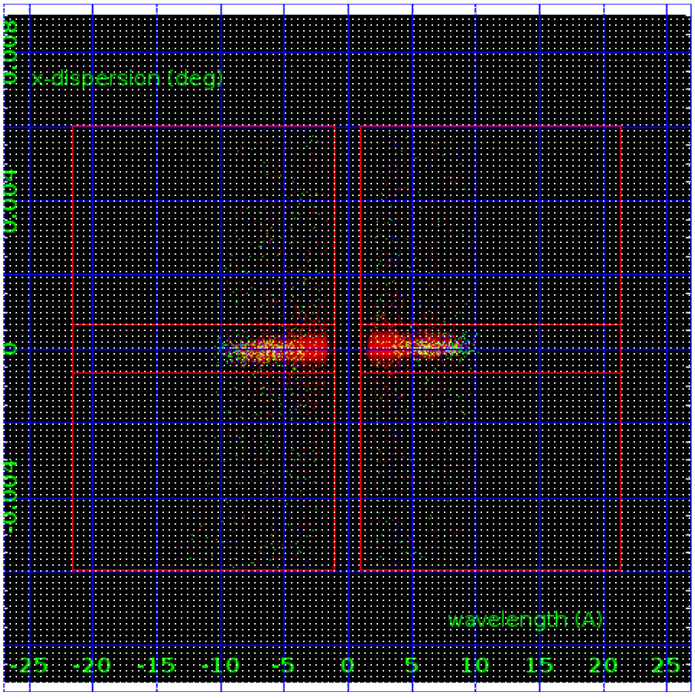
HEG Order Sort 123



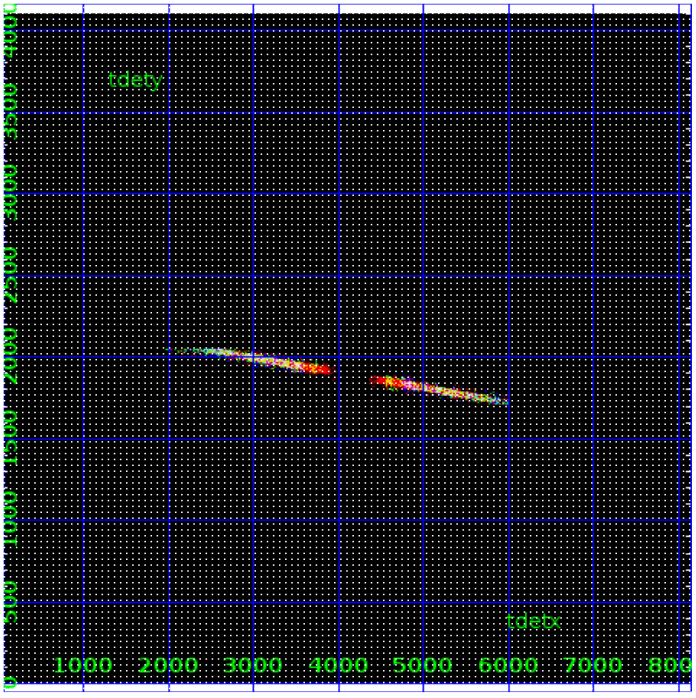
HEG Zero Order



HEG Order Sort ALL

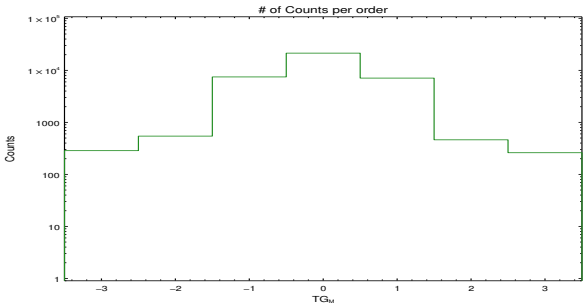


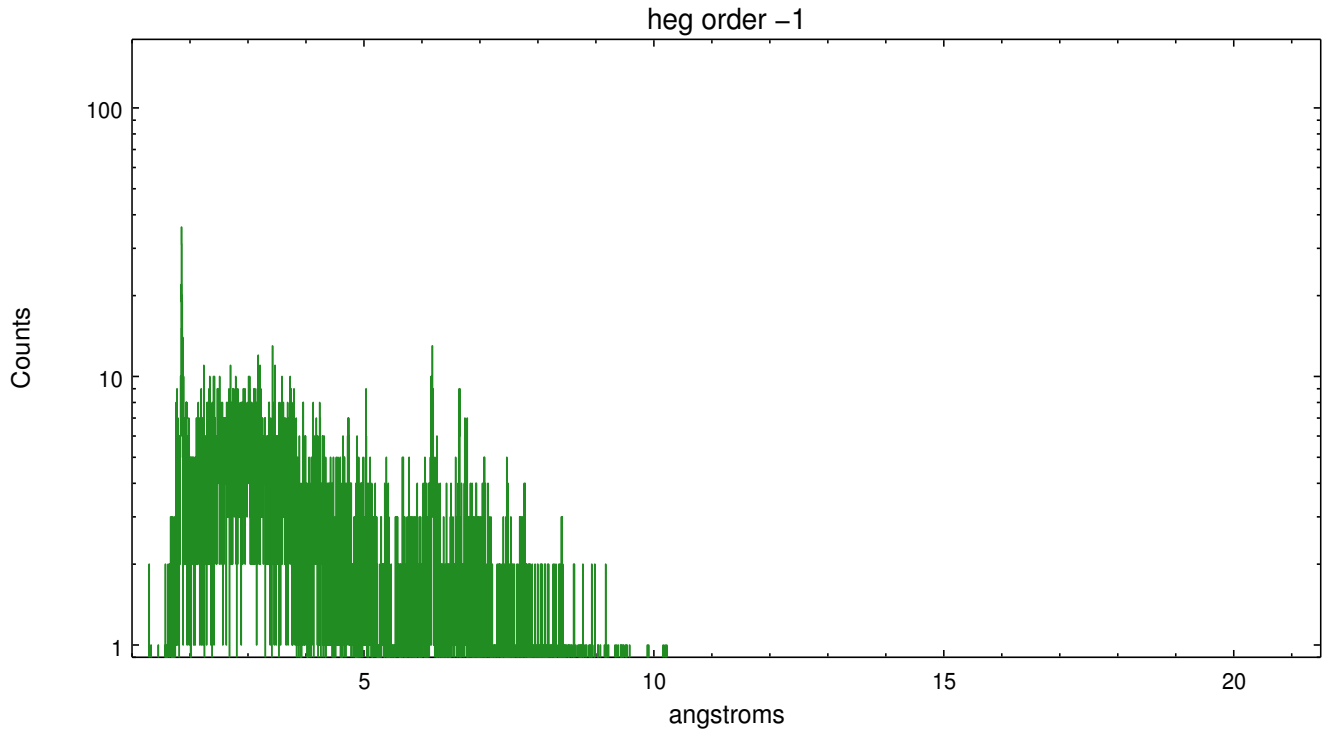
Spot Image HEG

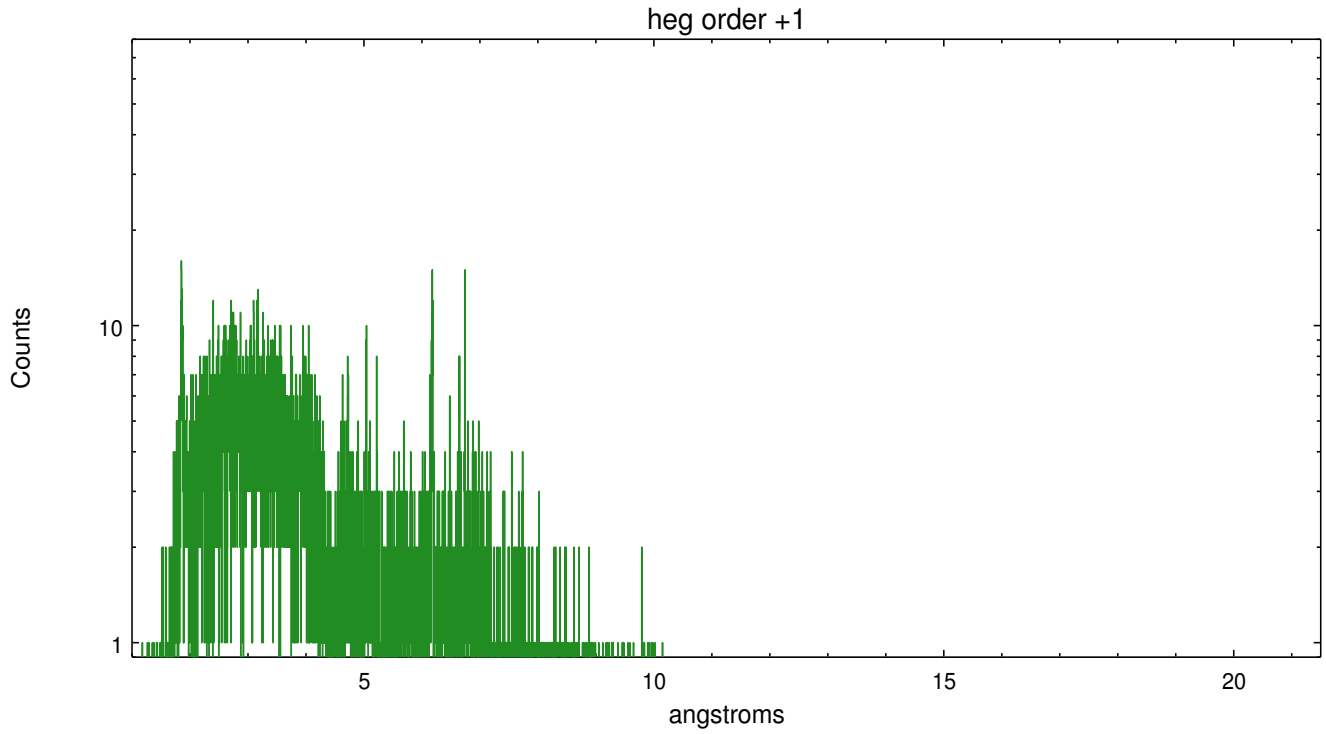


Full Detector HEG

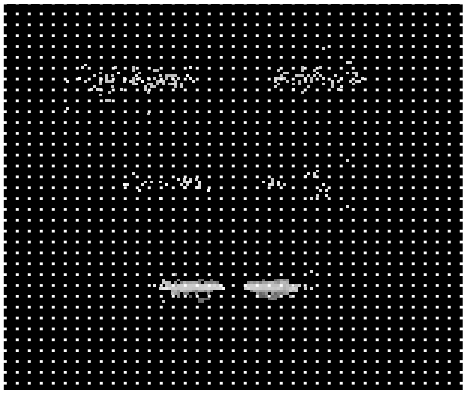
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	286	544	7477	21426	7097	462	261



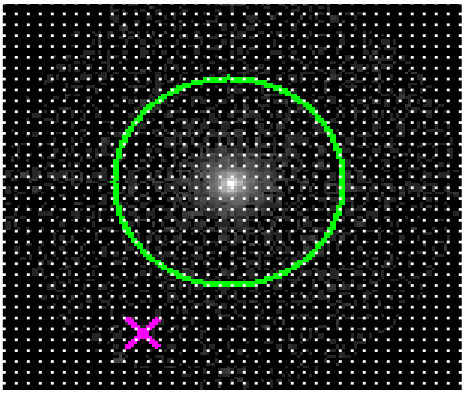

heg order −1
Counts
100
10
1
5
10
15
20
angstroms


heg order +1
Counts
10
1
5
10
15
20
angstroms

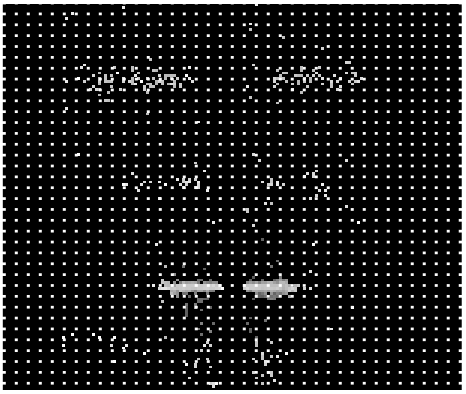
3.2 MEG Arm



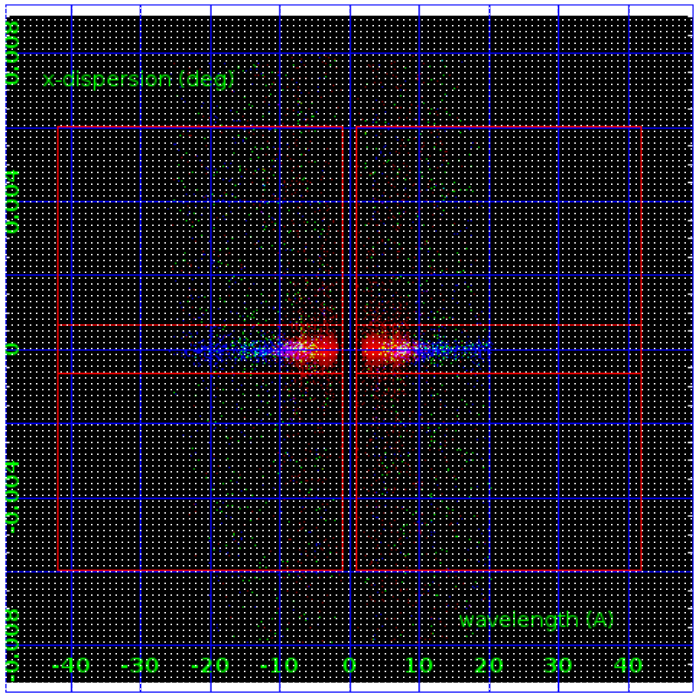
MEG Order Sort 123



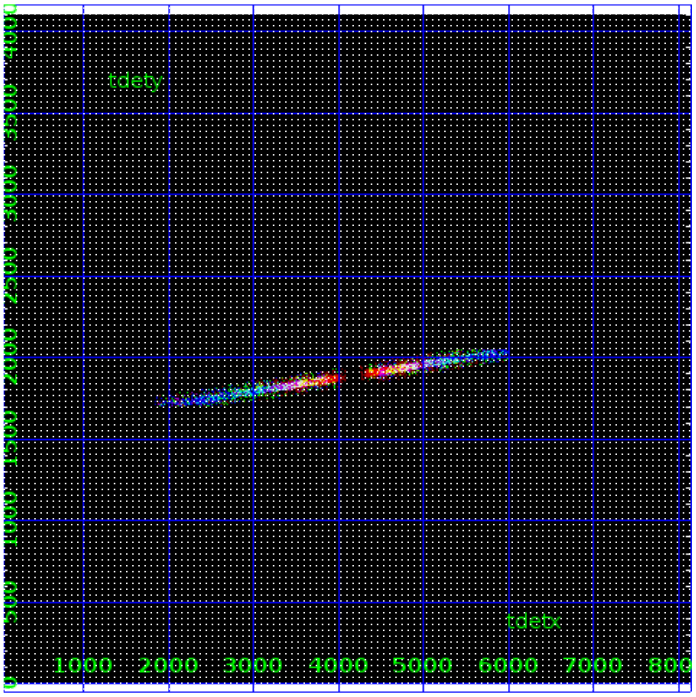
MEG Zero Order



MEG Order Sort ALL

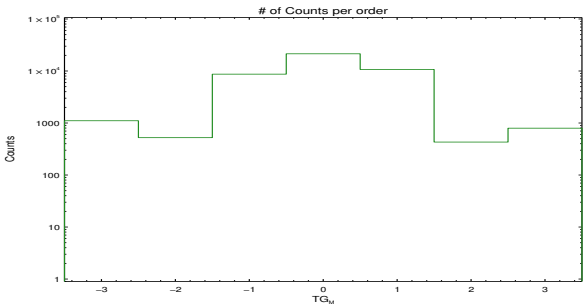


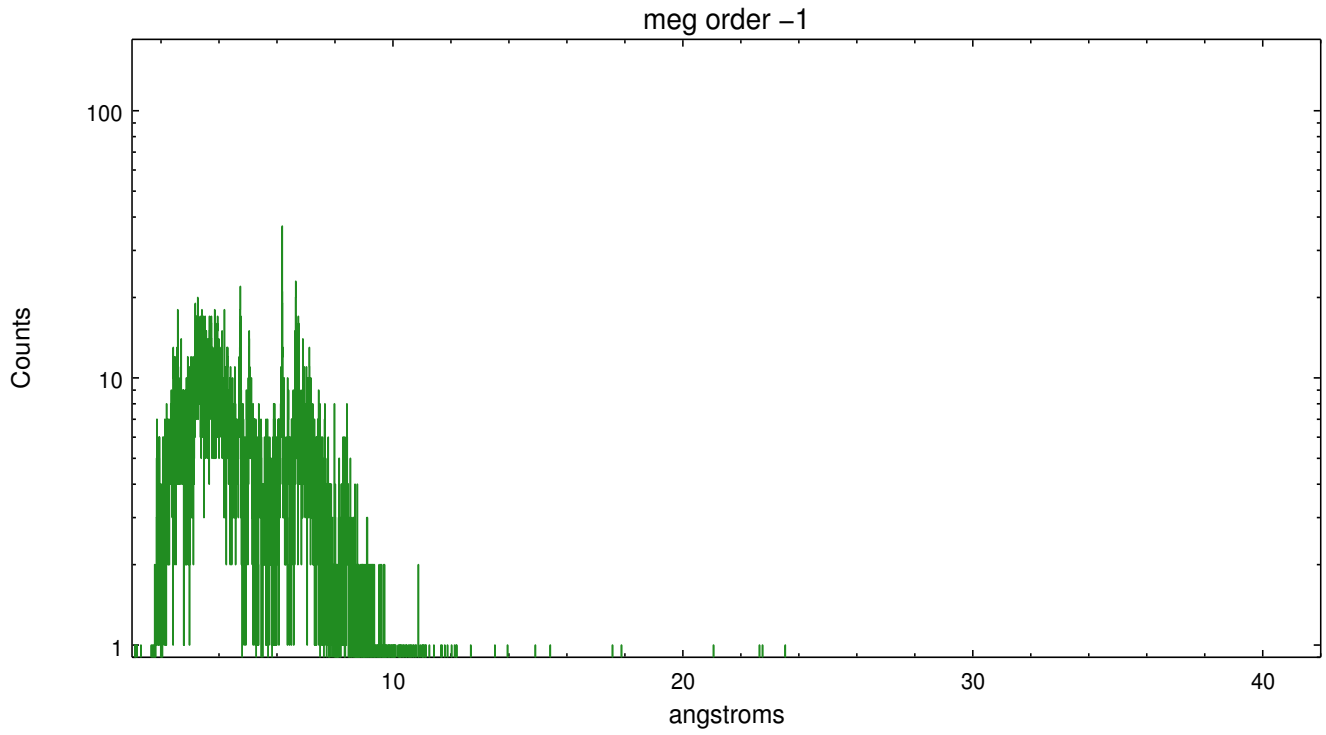
Spot Image MEG

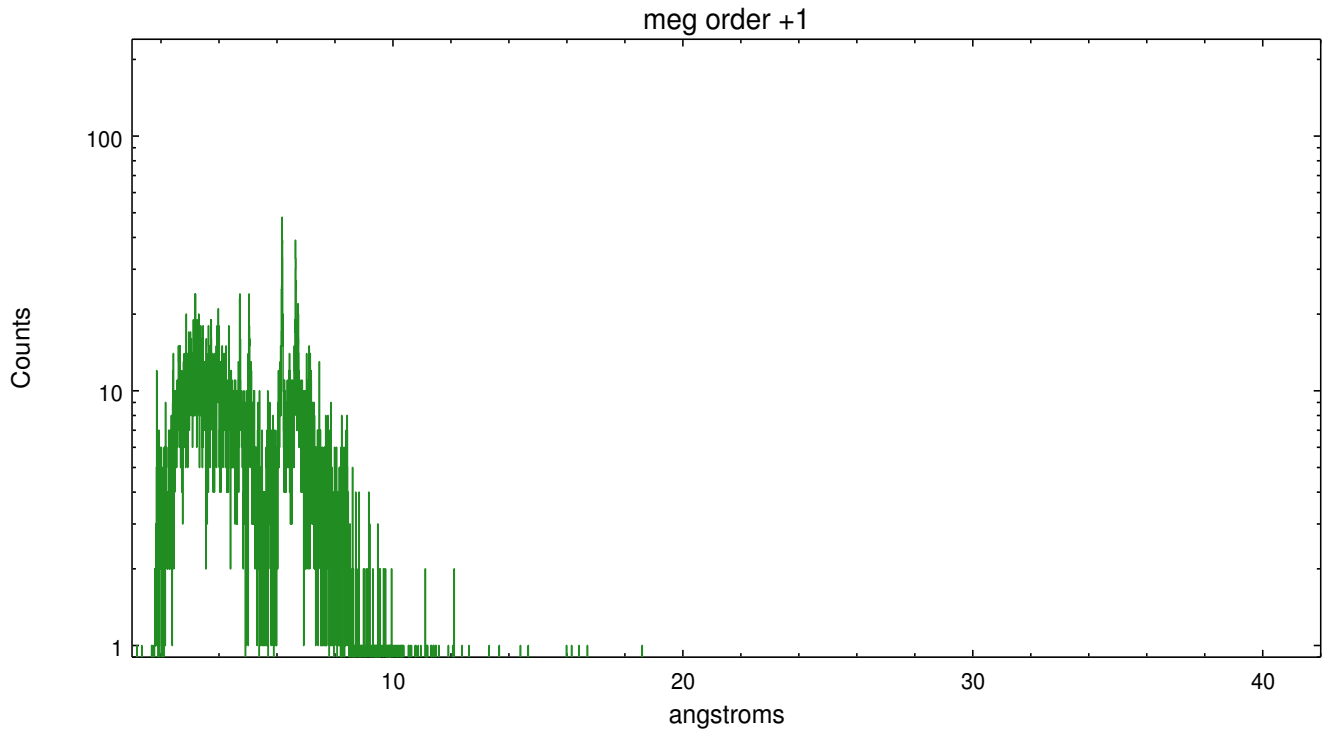


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1106	523	8690	21426	10708	430	795




meg order −1
Counts
100
10
1
10
20
30
40
angstroms


meg order +1
Counts
100
10
1
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Melania Nynka
V&V Date (YYYY-MM-DD)	2019.05.21
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	35.020801391602

A.2 Comments

```
Comments for Obi 0
The ACIS focal plane temperature is warmer than -114.0 C degrees during
the interval 674588994.85 - 674610293.65 (MET s) of this observation.
This temperature is the upper limit of the verified ACIS calibration for
the front-illuminated chips. The focal plane temperature is warmer than
-112.0 C during the interval 674588994.85 - 674599630.45 (MET s) of this
observation. This temperature is the upper limit of the verified ACIS
calibration for the back-illuminated chips. The ACIS spectral response
calibration is less accurate at these warmer temperatures than it is at
-115.0 C. Users whose science objectives depend on the most accurate
spectral response (e.g., fitting line-rich spectra) may notice an
effect. Users whose science objectives do not depend on the most
accurate spectral response should not notice an effect.
```