V&V Reference Report
L2 ASCDS Version : 8.4.3

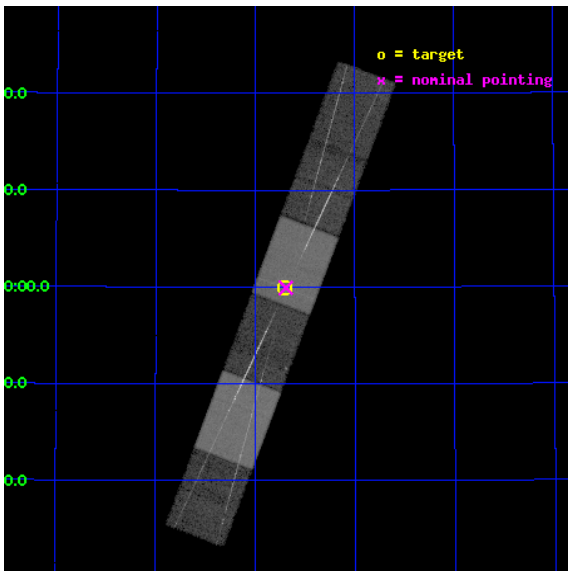
Observation 6471 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : Mar 30 2012

Contents

1 Front

seq_num	290564	Sequence number
obs_id	6471	Observation id
title	AO7 Calibration Observations of Capella	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	Capella	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	79.17625	Observer's specified target RA [deg]
dec_targ	45.997889	Observer's specified target Dec [deg]
ra_nom	79.173278054354	Nominal RA [deg]
dec_nom	45.998661666061	Nominal Dec [deg]
roll_nom	290.6387237842	Nominal Roll [deg]
revision	2	Processing version of data
ontime	30043.920527697	Sum of GTIs [s]
livetime	29558.685152237	Livetime [s]
ontime4	30043.9615677	Sum of GTIs [s]
ontime5	30043.879487693	Sum of GTIs [s]
ontime6	30043.83844769	Sum of GTIs [s]
ontime7	30043.920527697	Sum of GTIs [s]
ontime8	30043.797407687	Sum of GTIs [s]
ontime9	30043.756367713	Sum of GTIs [s]
l2events	413013	Number of level 2 events

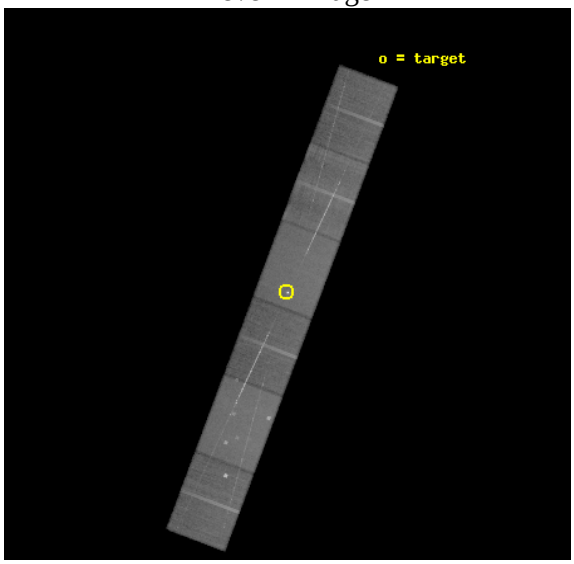


2 OBI

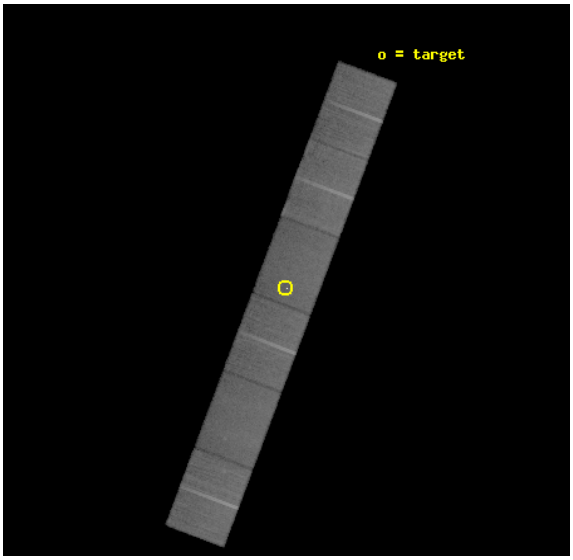
2.1 OBI

2.1.1 Images

Level 1 Image

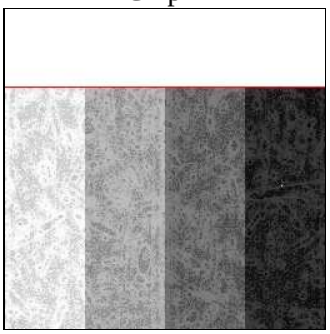


Level 1 Bad Events

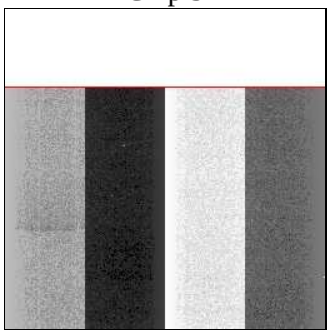


2.1.2 Bias

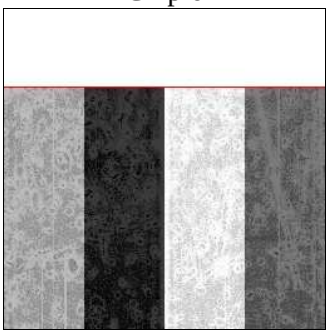
Chip 4



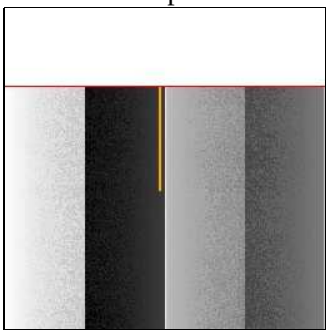
Chip 5



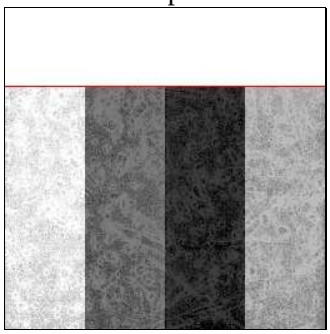
Chip 6



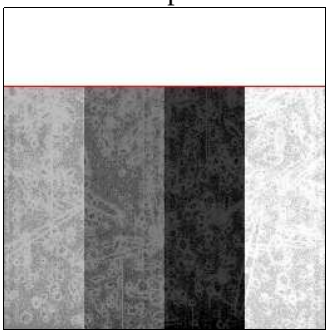
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	8.4.3	Processing system revision
caldbver	4.4.8	
date	2012-03-30T06:27:21	Date and time of file creation
revision	2	Processing version of data

sched_exp_time	30000.000000	[s] Scheduled observation exposure time
ontime	30043.920527697	Sum of GTIs [s]
ontime4	30043.9615677	Sum of GTIs [s]
ontime5	30043.879487693	Sum of GTIs [s]
ontime6	30043.83844769	Sum of GTIs [s]
ontime7	30043.920527697	Sum of GTIs [s]
ontime8	30043.797407687	Sum of GTIs [s]
ontime9	30043.756367713	Sum of GTIs [s]
l1events	1567287	Number of level 1 events

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	235867	327011	222694	297636	277946	206133
rejected events	196828	162821	179105	166399	200450	176159
rejected %	83%	49%	80%	55%	72%	85%

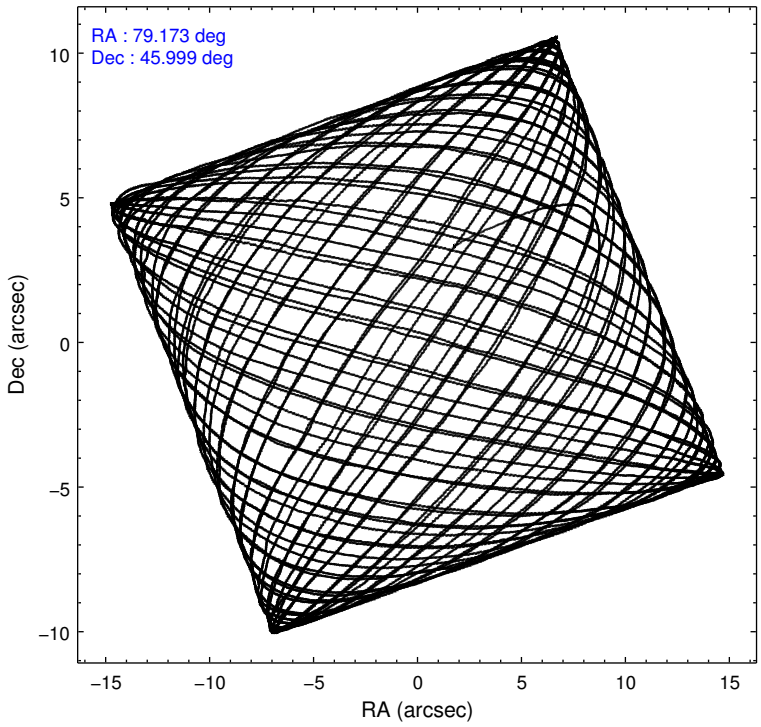
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	23727	27213	25798	13850	35584	14565
	10%	8%	11%	4%	12%	7%
grade 1 events	246	681	175	490	242	128
	0%	0%	0%	0%	0%	0%
grade 2 events	5818	46133	6754	26987	14151	5283
	2%	14%	3%	9%	5%	2%
grade 3 events	2687	8265	3028	11904	6347	2668
	1%	2%	1%	3%	2%	1%
grade 4 events	2640	7922	2998	11924	5983	2602
	1%	2%	1%	4%	2%	1%
grade 5 events	8781	23445	9134	27100	12149	9896
	3%	7%	4%	9%	4%	4%
grade 6 events	4169	74668	5014	66589	15437	4859
	1%	22%	2%	22%	5%	2%
grade 7 events	187799	138684	169793	138792	188053	166132
	79%	42%	76%	46%	67%	80%

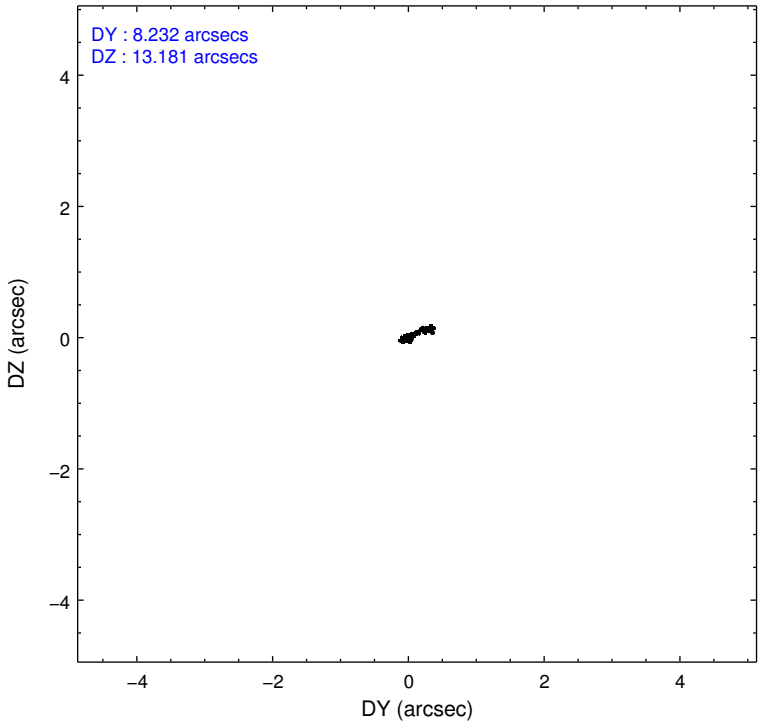
2.2 Compared Parameters

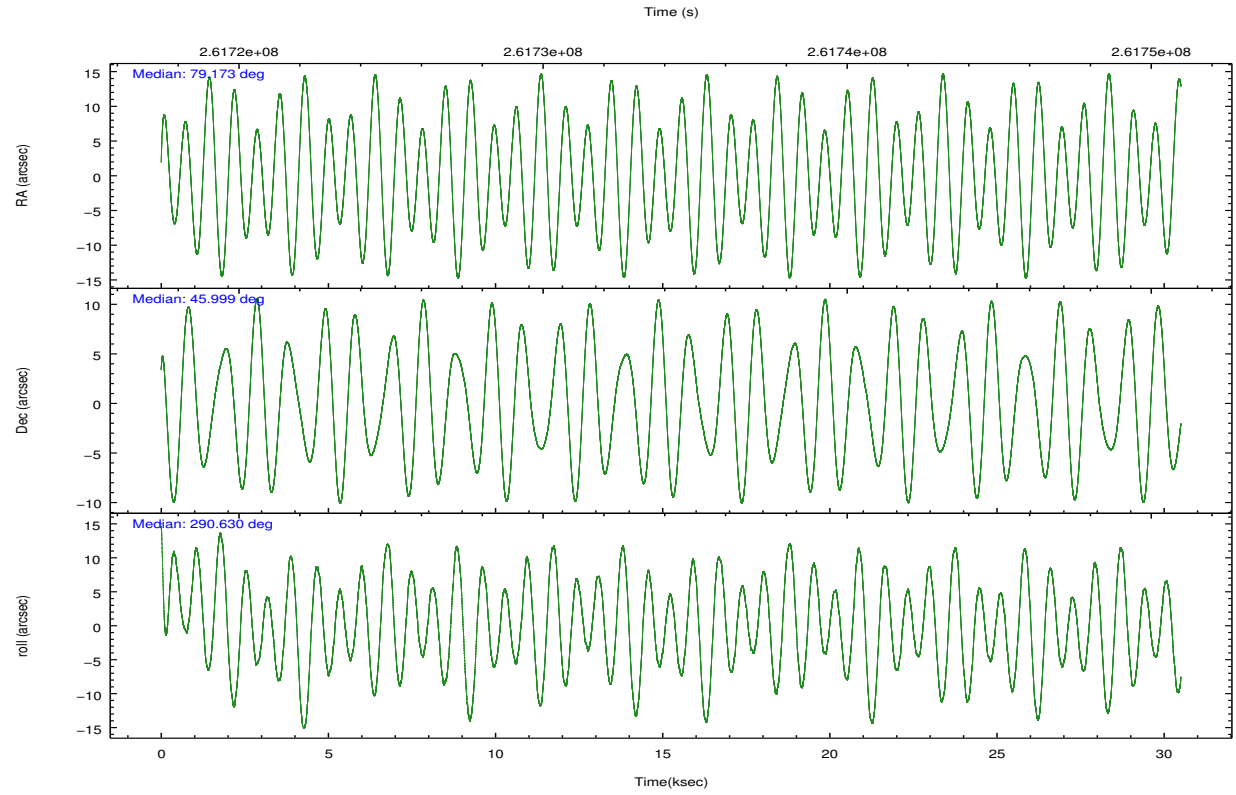
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	79.142609	79.17327805435406
[deg] Pointing Dec	46.015669	45.99866166606093
[deg] Pointing Roll	290.504154	290.6387237842042
[s] Window start time (MET)	254448065.184000	254448065.184000
[s] Window stop time (MET)	262742465.184000	262742465.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-187.132523	-187.1254020033014
[mm] SIM translation stage offset	-3	-3.007120579706367
[s] Observation start time (MET)	261719463.184000	261718251.14607
Observation start date	2006-04-18T03:49:58	2006-04-18T03:30:51
[s] Observation end time (MET)	261749463.184000	261750256.26006
Observation end date	2006-04-18T12:09:58	2006-04-18T12:24:16
Read mode	TIMED	TIMED

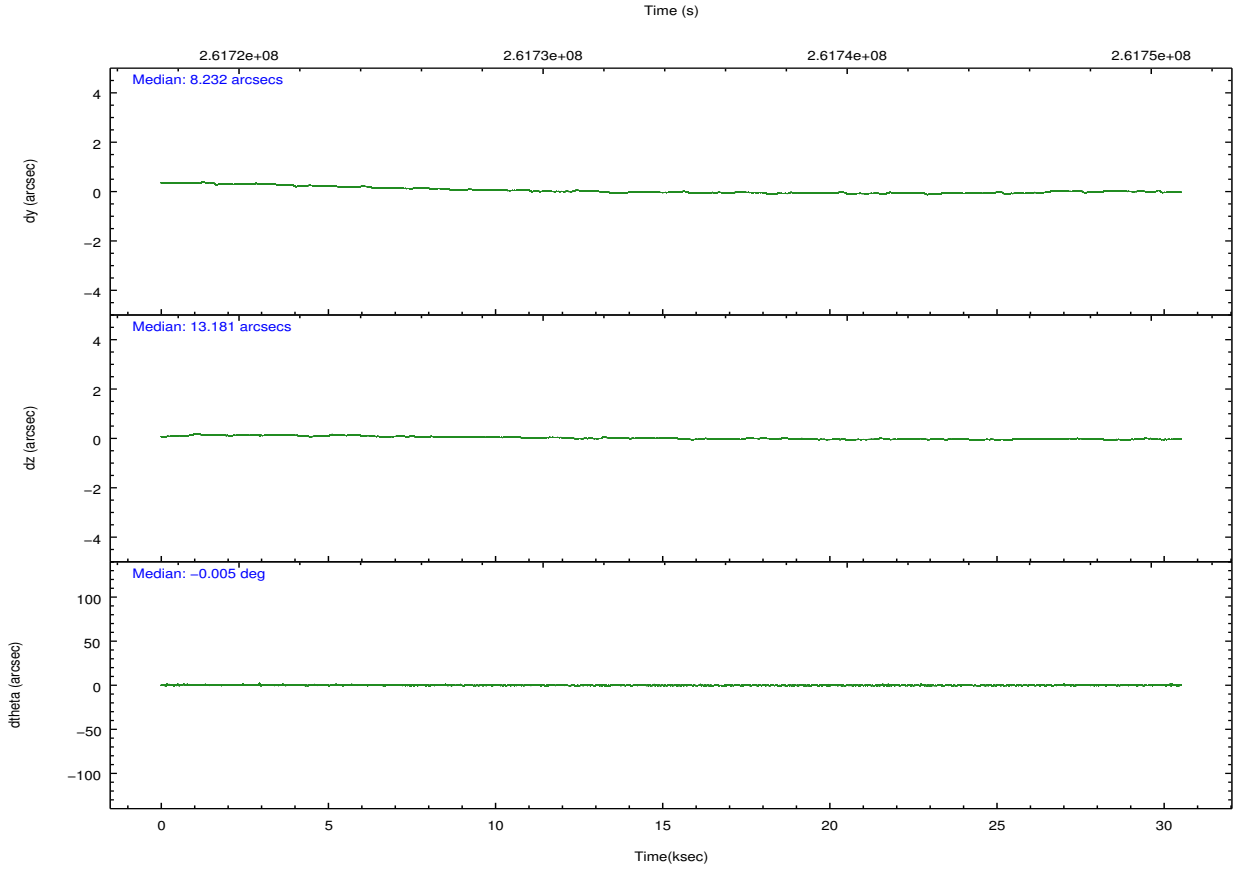
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	1	1
Subarray row count	774	774
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	2.5

2.3 Aspect


RA : 79.173 deg
Dec : 45.999 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−15
−10
−5
0
5
10
15


DY : 8.232 arcsecs
DZ : 13.181 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
2.6172e+08
2.6173e+08
2.6174e+08
2.6175e+08
Median: 79.173 deg
Median: 45.999 deg
Median: 290.630 deg
RA (arcsec)
Dec (arcsec)
roll (arcsec)
Time(ksec)

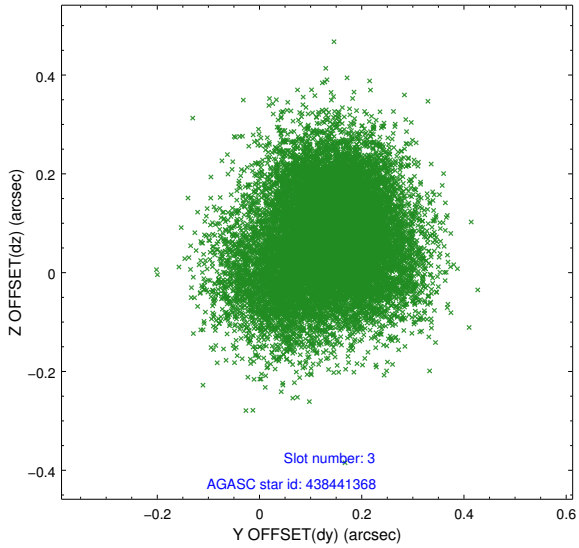

Time (s)
2.6172e+08
2.6173e+08
2.6174e+08
2.6175e+08
Median: 8.232 arcsecs
Median: 13.181 arcsecs
Median: −0.005 deg
dy (arcsec)
dz (arcsec)
dtheta (arcsec)
Time(ksec)

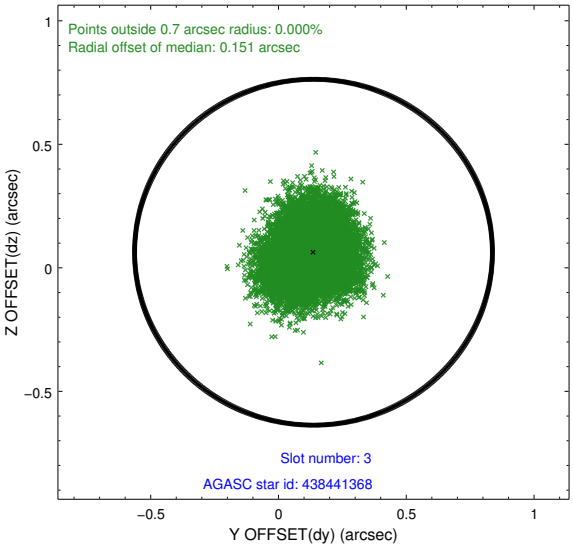
Slot Statistics

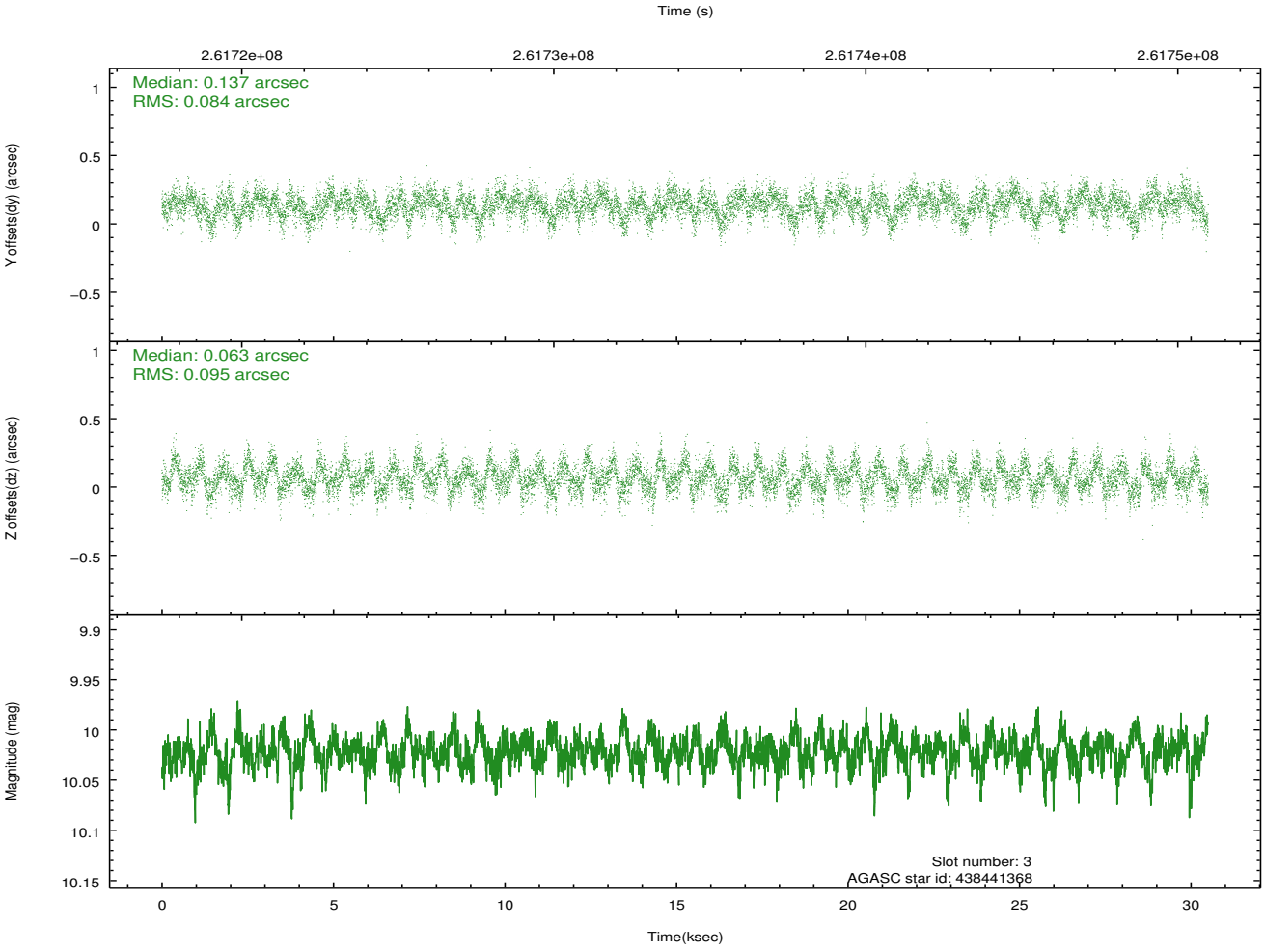
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.10	7439	-0.074	-0.063	0.008	0.013	0.000000	0.000000	-760.90	-1796.70
1	FID	ACIS-S-4	7.20	7439	0.150	0.053	0.010	0.023	0.000000	0.000000	2152.53	111.87
2	FID	ACIS-S-5	7.23	7439	-0.108	0.019	0.009	0.020	0.000000	0.000000	-1813.72	105.51
3	GUIDE	438441368	10.02	14836	0.137	0.063	0.136	0.218	78.646413	46.420494	-1799.50	-641.50
4	GUIDE	438460832	8.97	14866	0.069	0.037	0.100	0.159	78.414614	45.554782	904.23	-2296.69
5	GUIDE	440149808	8.44	14879	-0.168	0.098	0.074	0.119	78.873930	46.405955	-1550.53	-132.16
6	GUIDE	440163960	8.87	14868	0.063	-0.064	0.073	0.117	79.298370	45.827072	772.58	128.79
7	GUIDE	440164960	8.29	14876	-0.098	-0.141	0.093	0.142	79.132526	46.140947	-430.71	134.46

2.4 Star Slots

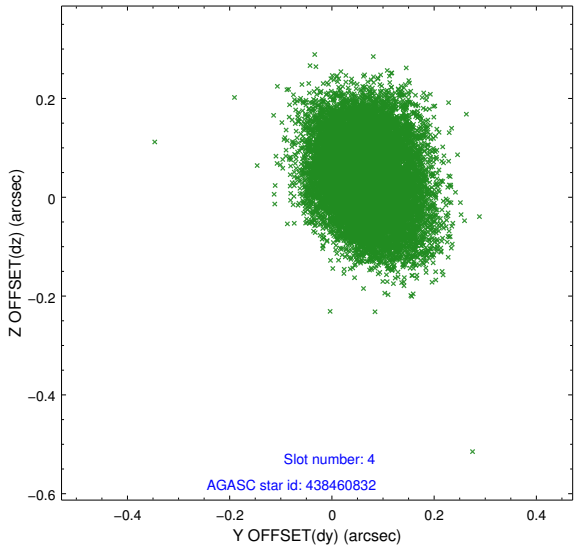
2.4.1 Slot 3

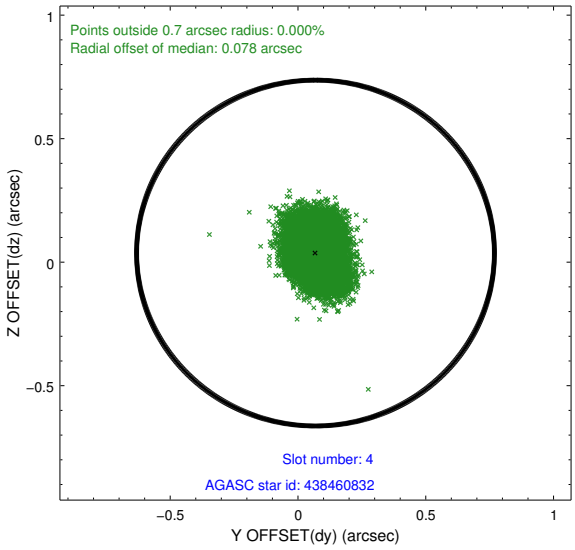


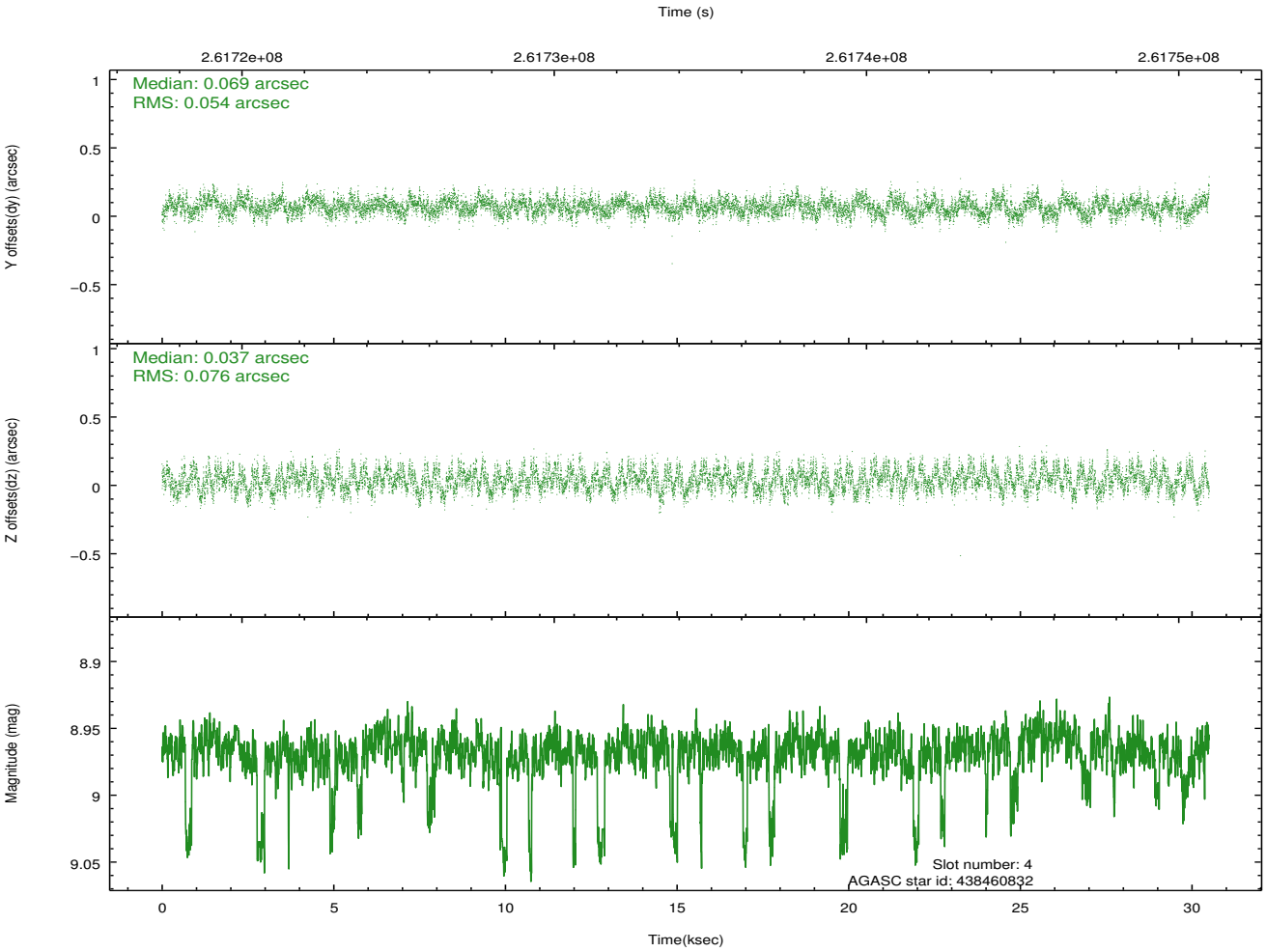




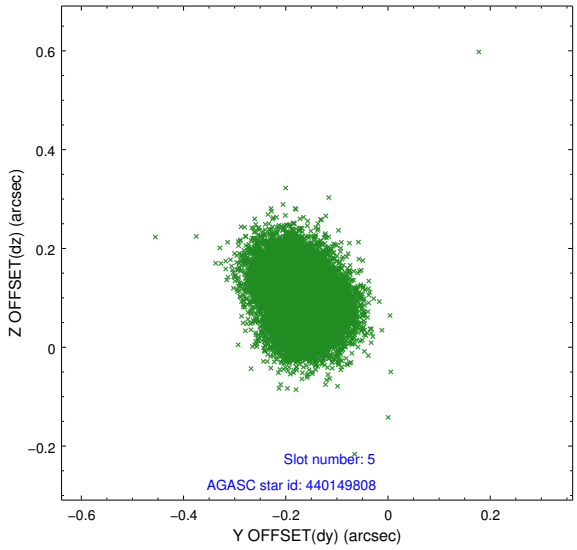
2.4.2 Slot 4

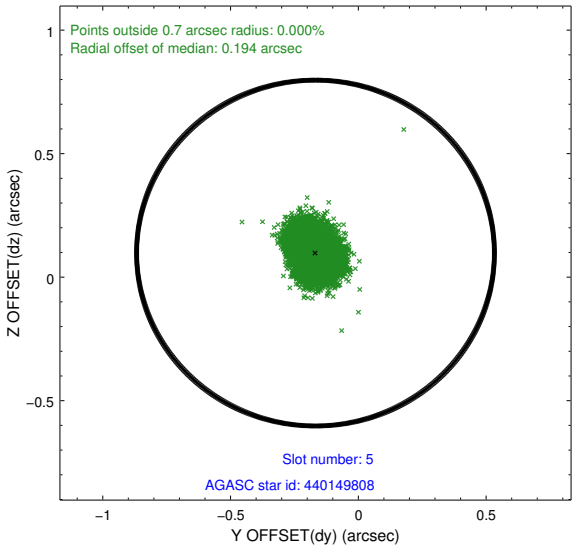

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 438460832

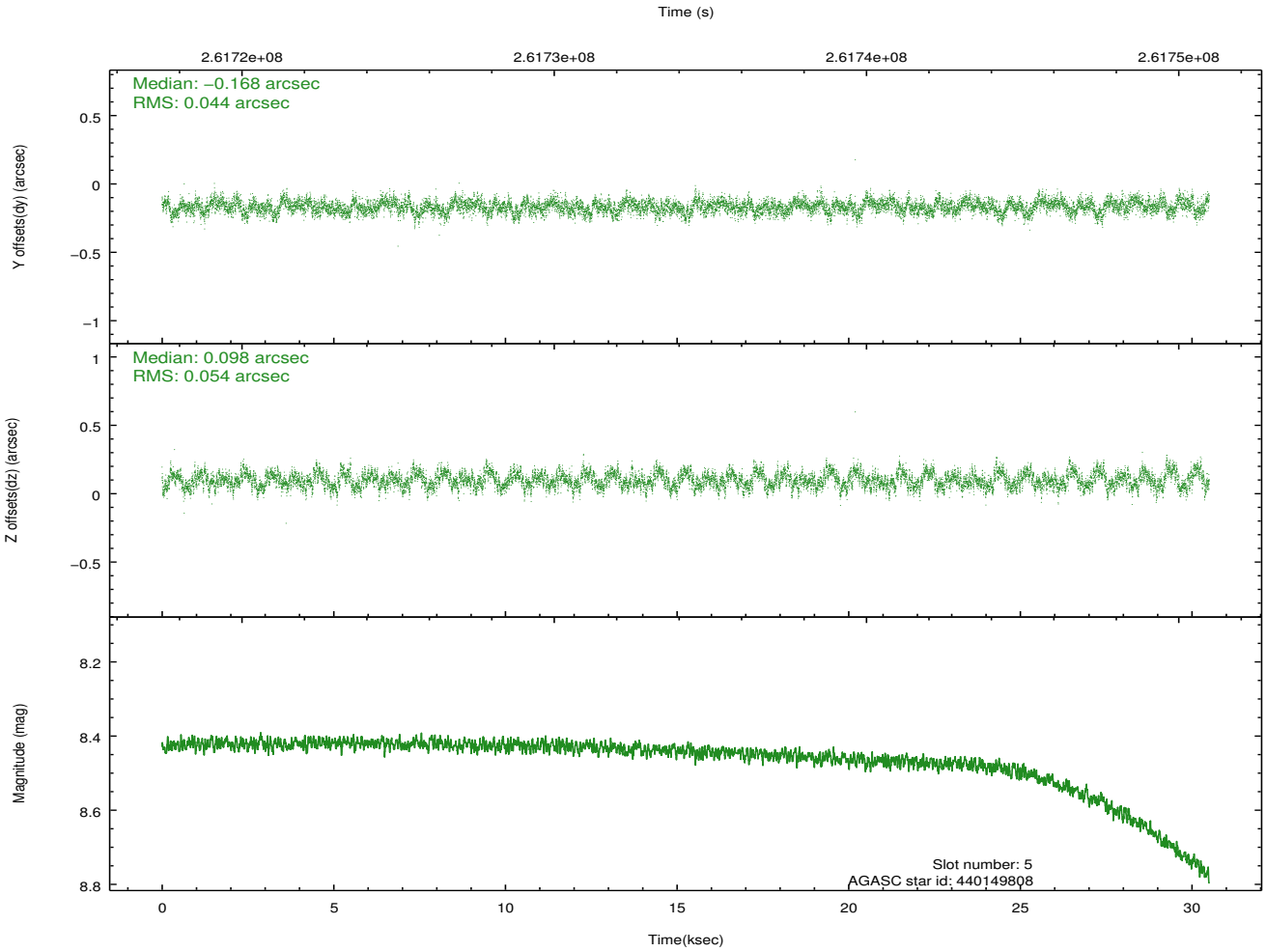

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.078 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 438460832


Time (s)
Median: 0.069 arcsec
RMS: 0.054 arcsec
Y offsets(dy) (arcsec)
Median: 0.037 arcsec
RMS: 0.076 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 438460832
Time(ksec)

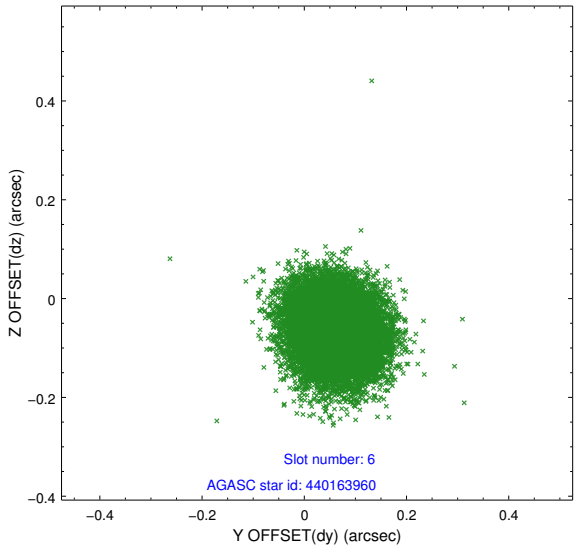
2.4.3 Slot 5

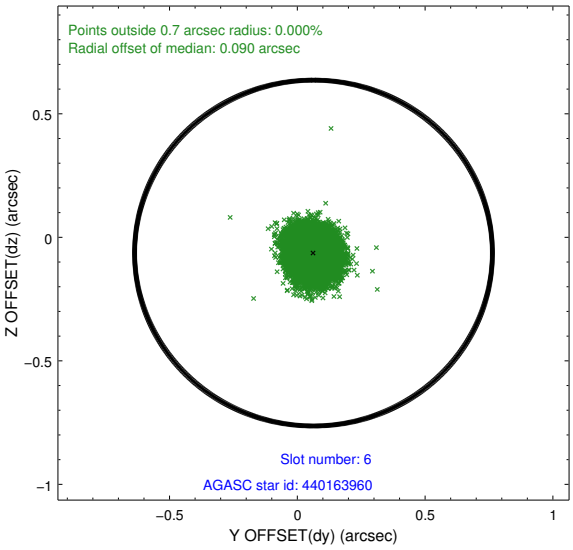

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 440149808

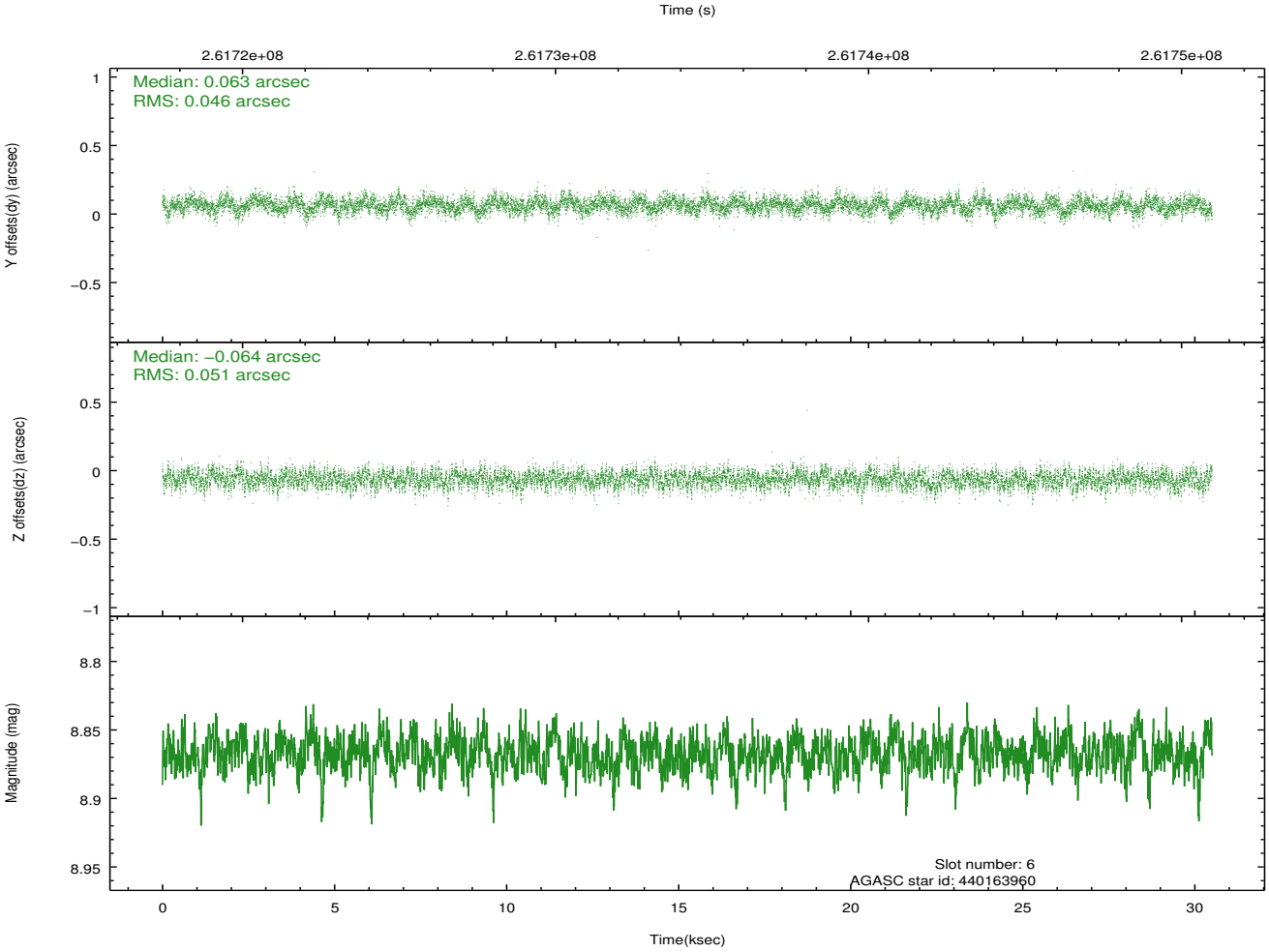

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.194 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 440149808


Time (s)
Median: −0.168 arcsec
RMS: 0.044 arcsec
Y offsets(dy) (arcsec)
Median: 0.098 arcsec
RMS: 0.054 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 440149808
Time(ksec)

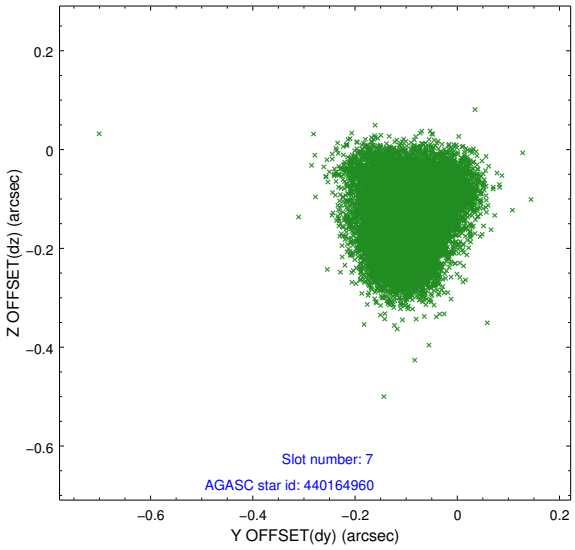
2.4.4 Slot 6

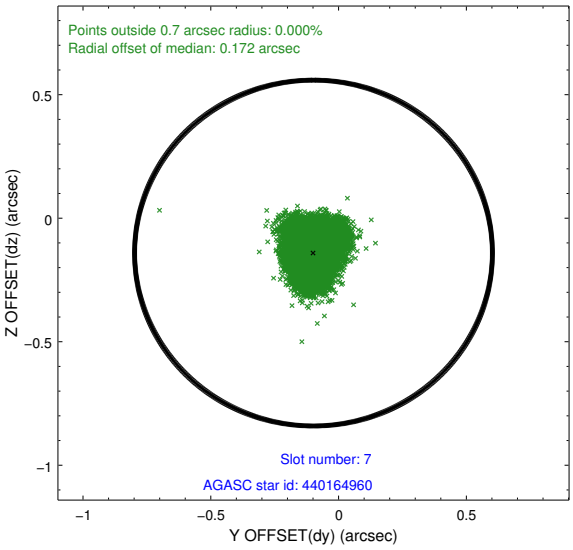

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 440163960

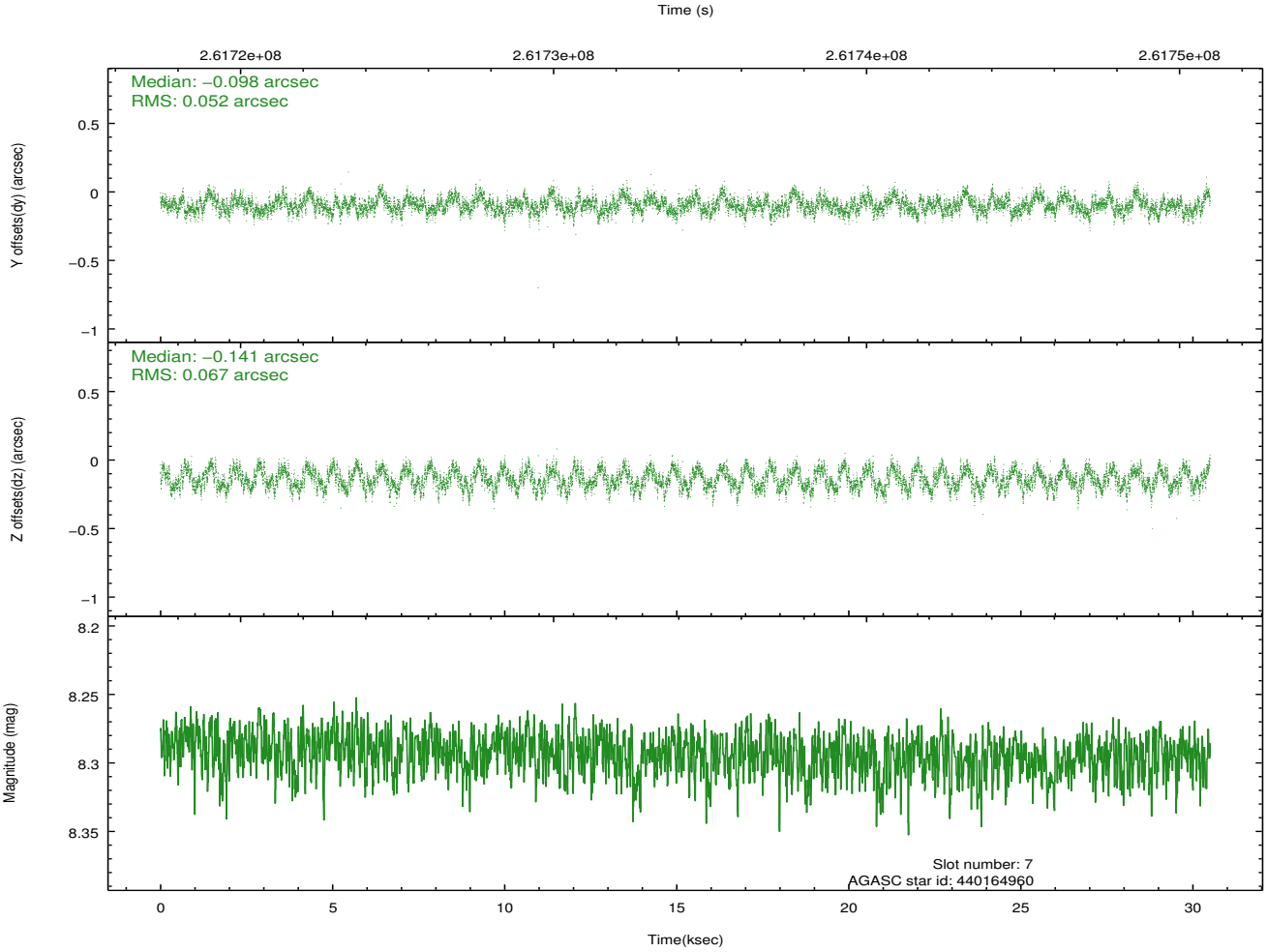

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.090 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 440163960


Time (s)
2.6172e+08
2.6173e+08
2.6174e+08
2.6175e+08
Median: 0.063 arcsec
RMS: 0.046 arcsec
Y offsets(dy) (arcsec)
Median: −0.064 arcsec
RMS: 0.051 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 440163960
Time(ksec)

2.4.5 Slot 7

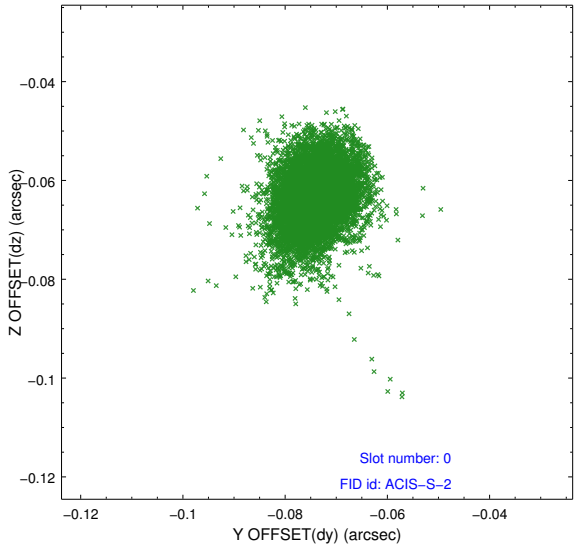

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 440164960

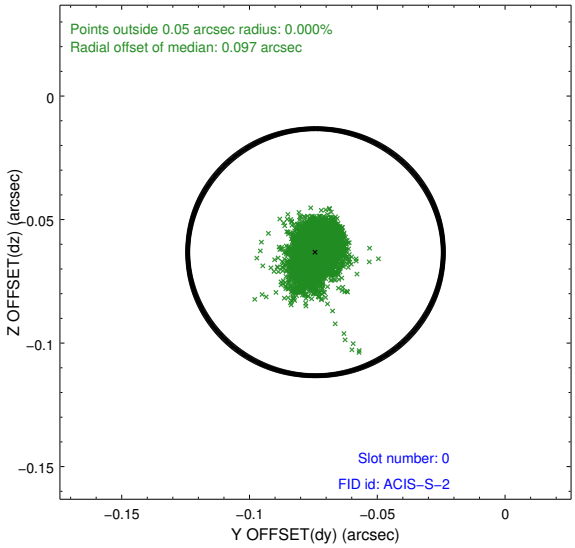

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.172 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 440164960

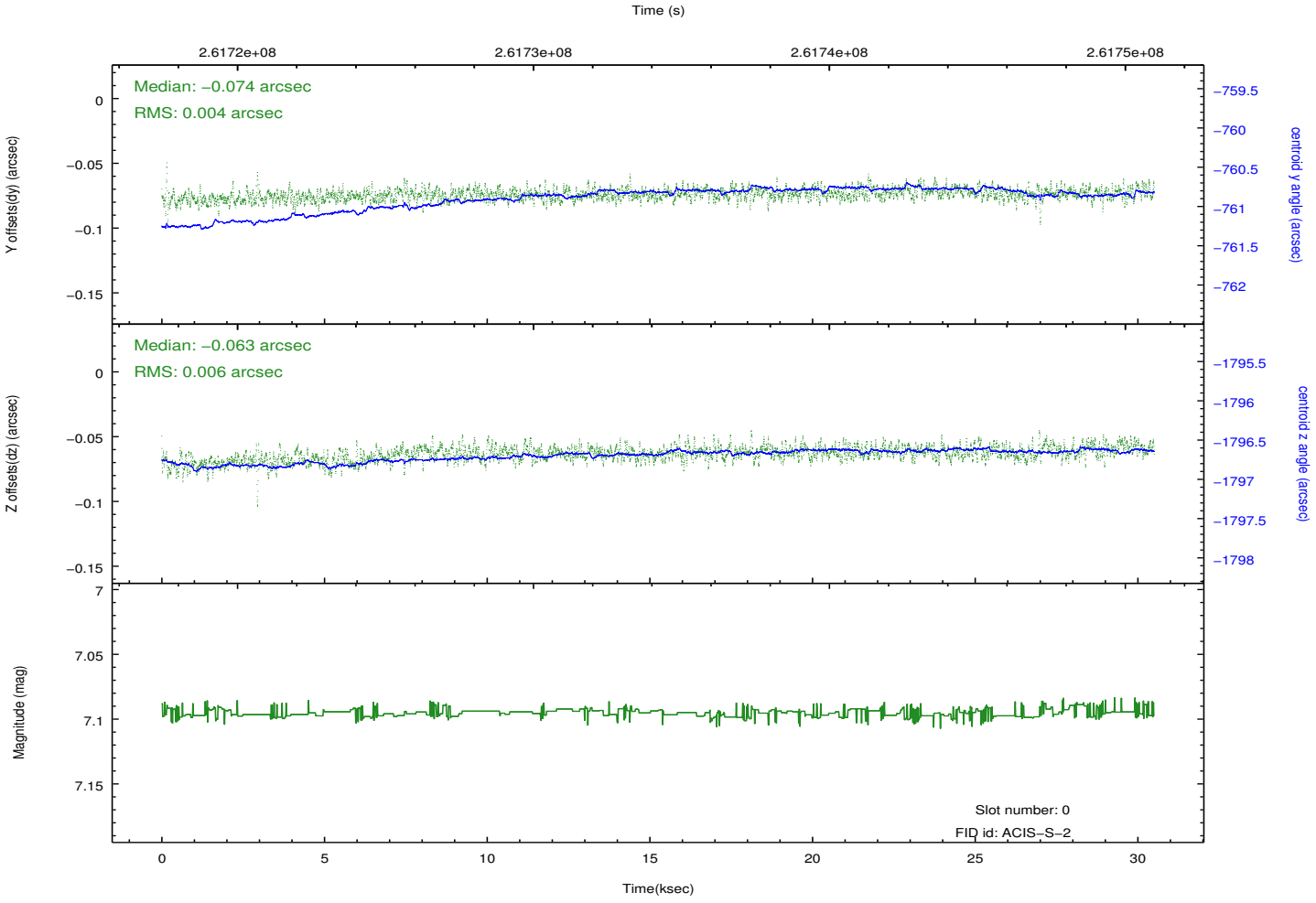

Time (s)
Median: −0.098 arcsec
RMS: 0.052 arcsec
Y offsets(dy) (arcsec)
Median: −0.141 arcsec
RMS: 0.067 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 440164960
Time(ksec)

2.5 FID Slots

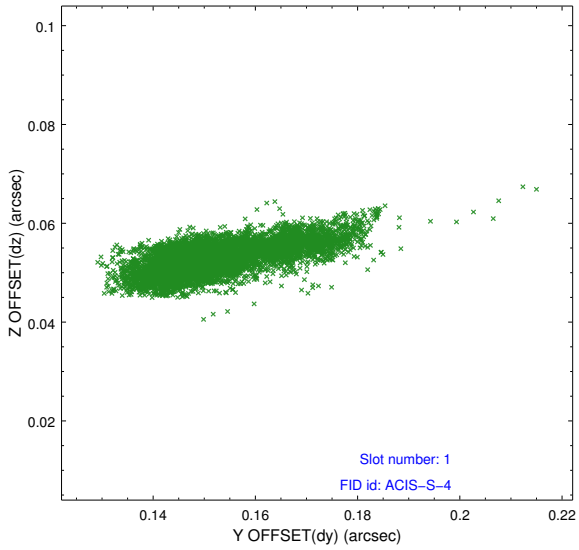
2.5.1 Slot 0

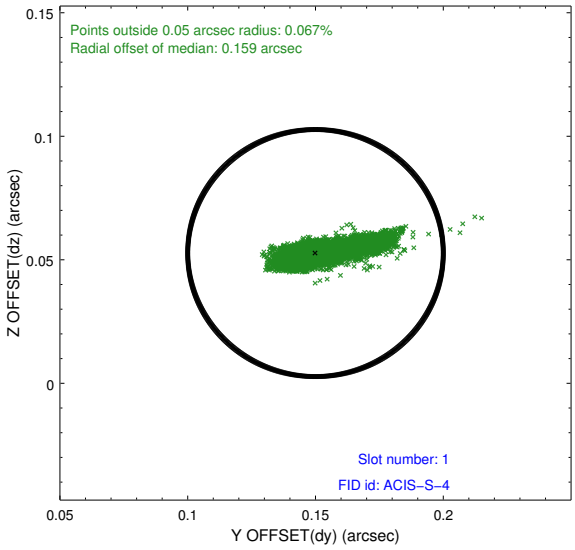


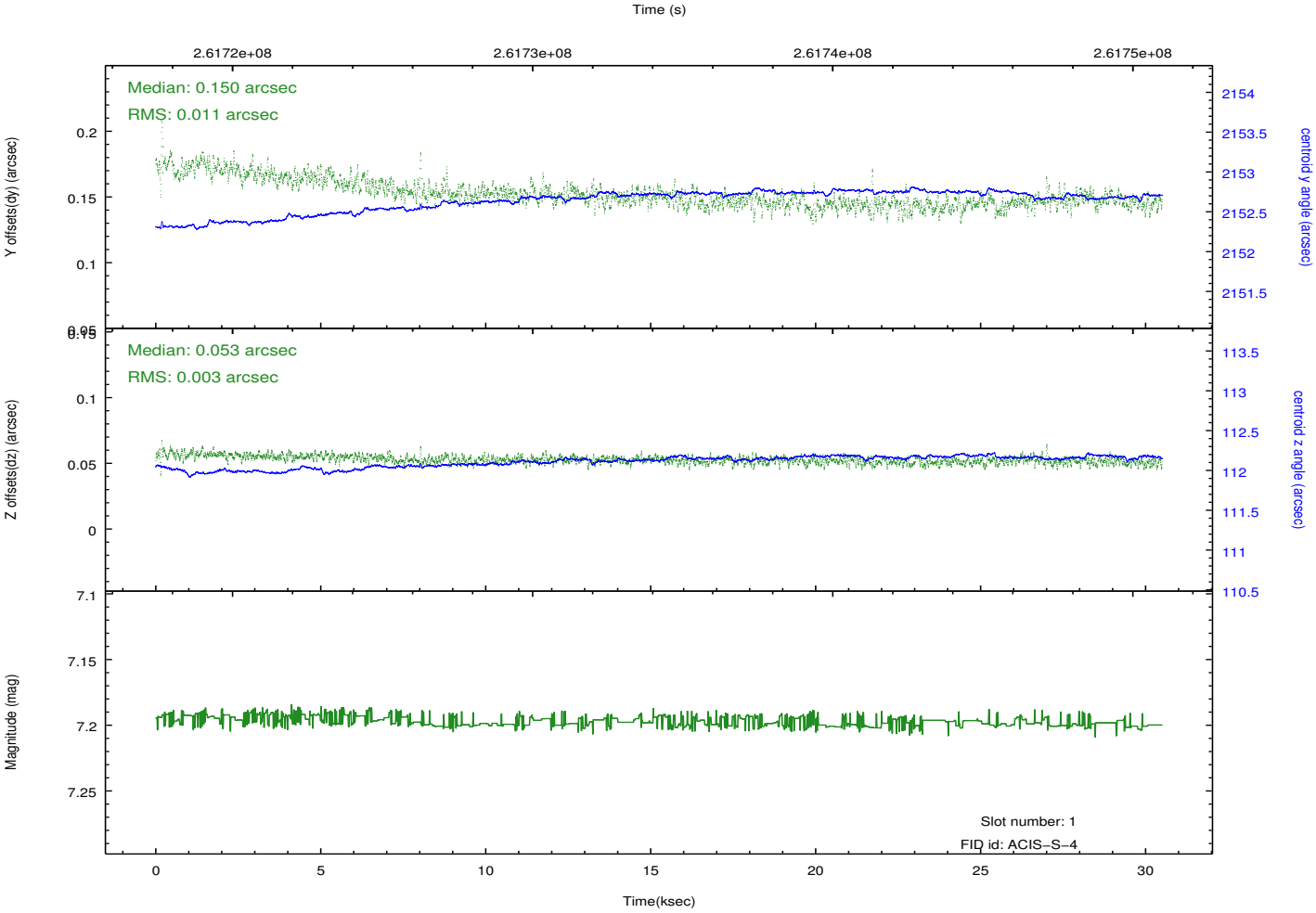




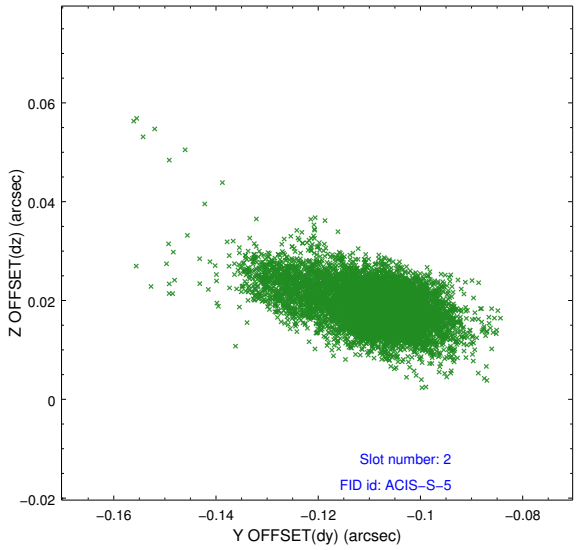
2.5.2 Slot 1

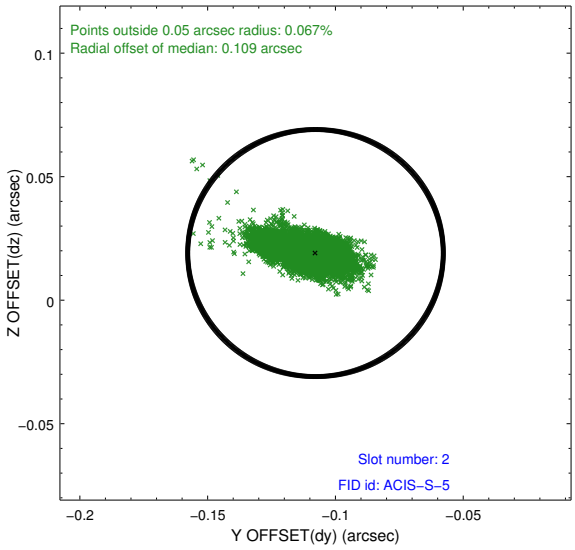

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

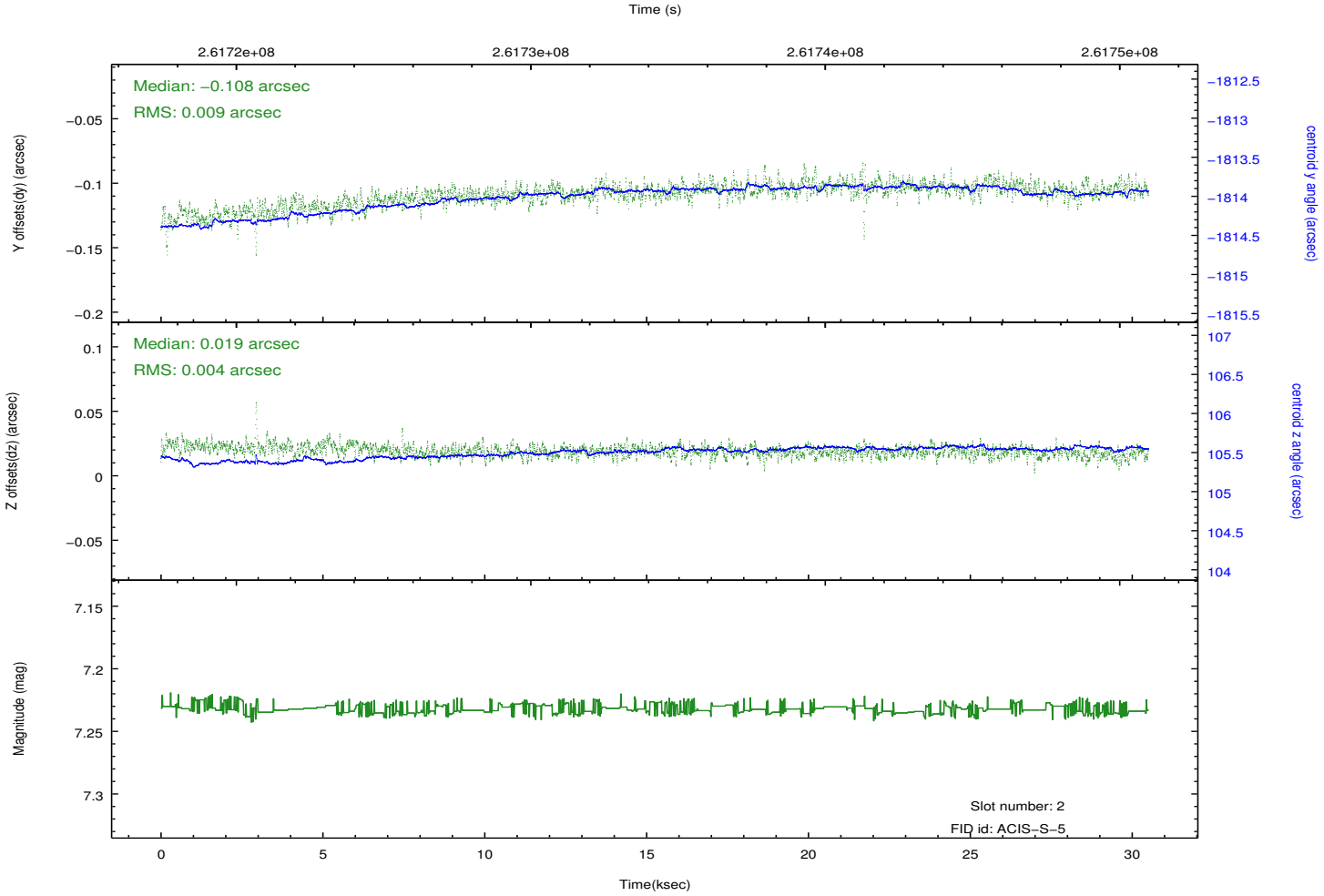

Points outside 0.05 arcsec radius: 0.067%
Radial offset of median: 0.159 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.150 arcsec
RMS: 0.011 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.053 arcsec
RMS: 0.003 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−S−4
Time(ksec)

2.5.3 Slot 2

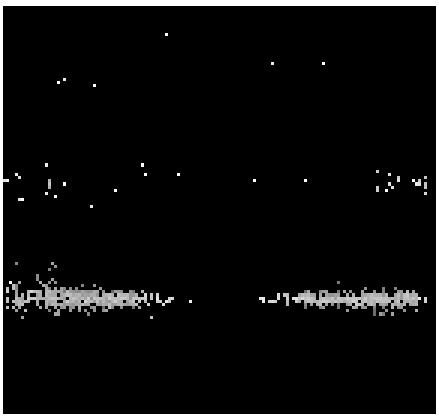

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Points outside 0.05 arcsec radius: 0.067%
Radial offset of median: 0.109 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5

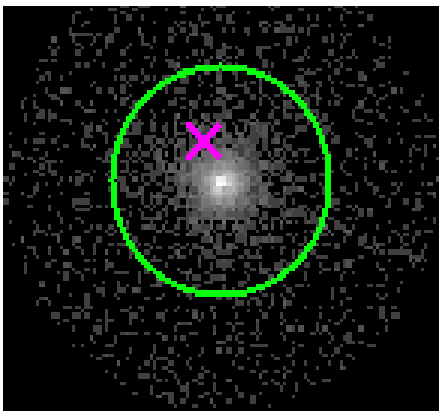

Time (s)
Median: −0.108 arcsec
RMS: 0.009 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.019 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

3 Gratings

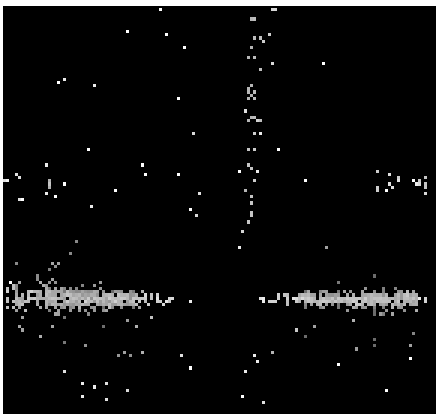
3.1 HEG Arm



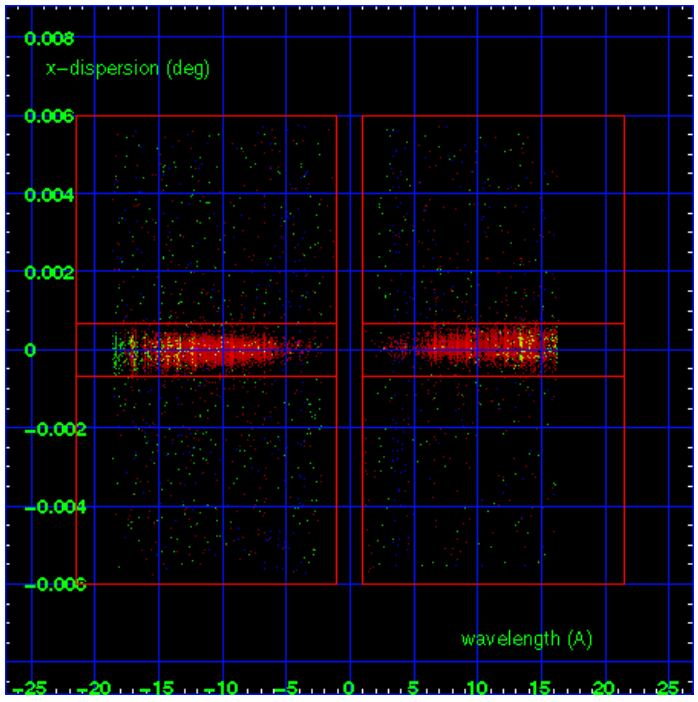
HEG Order Sort 123



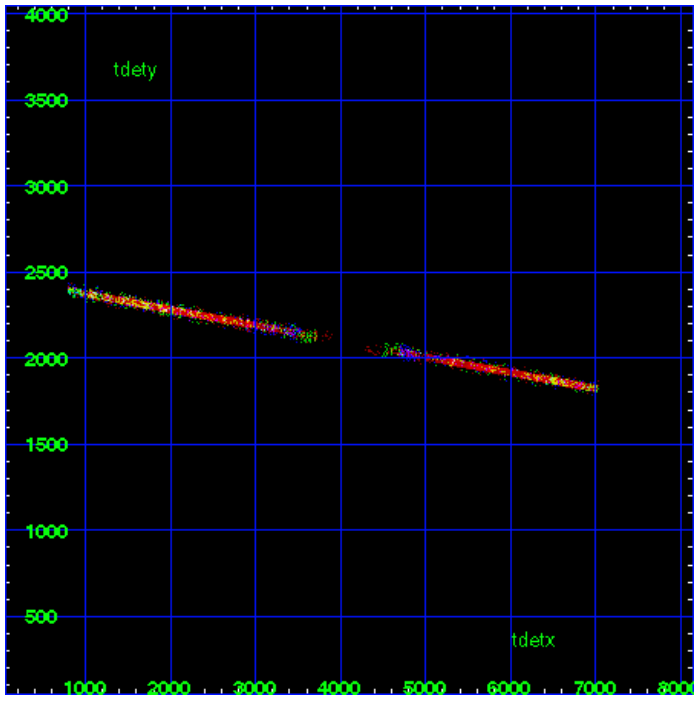
HEG Zero Order



HEG Order Sort ALL

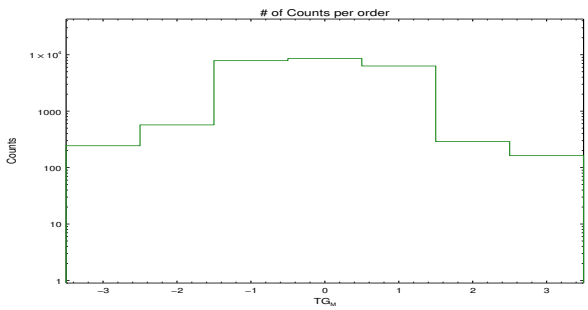


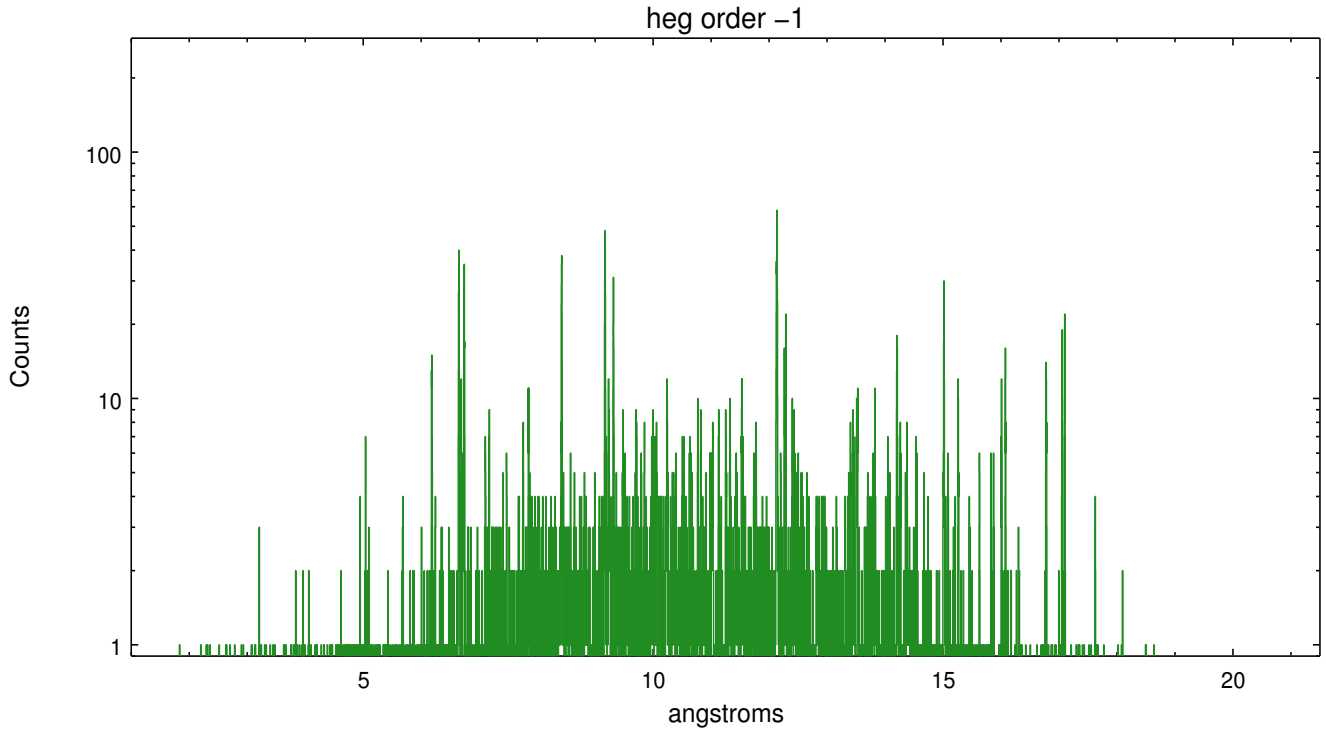
Spot Image HEG

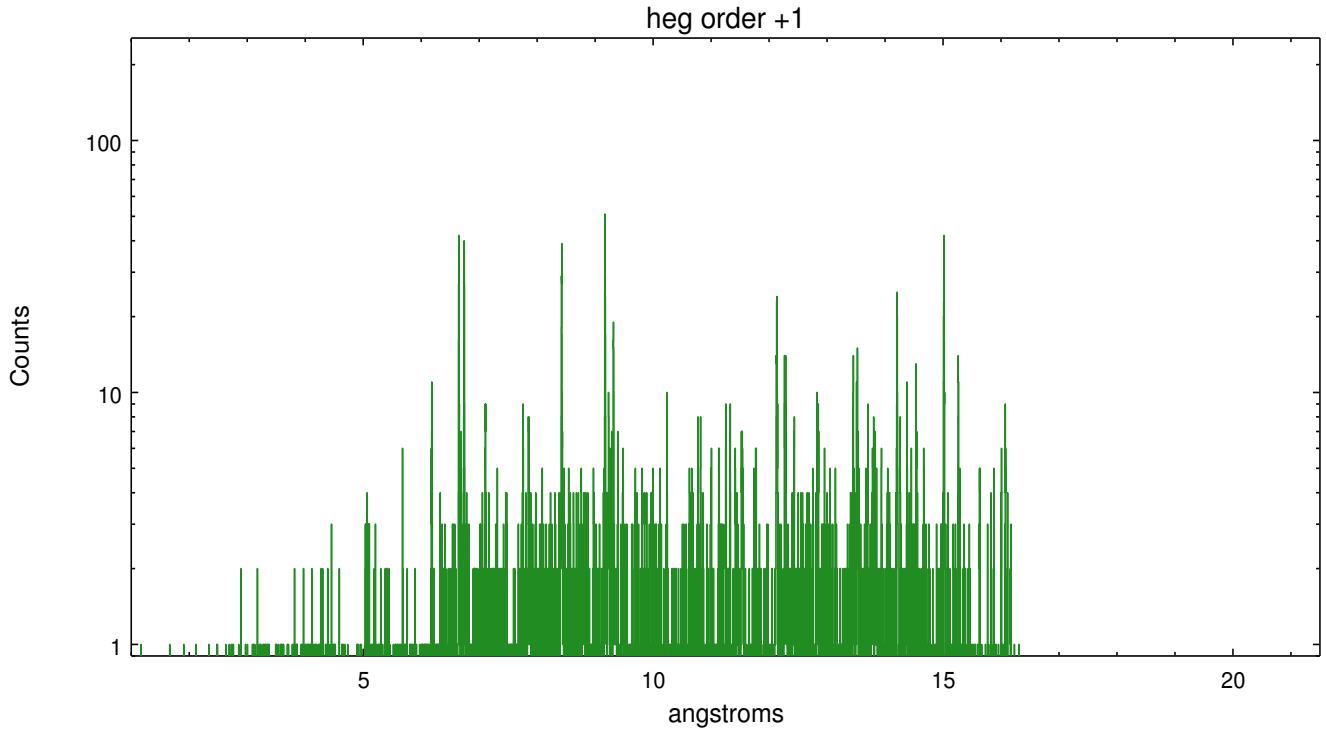


Full Detector HEG

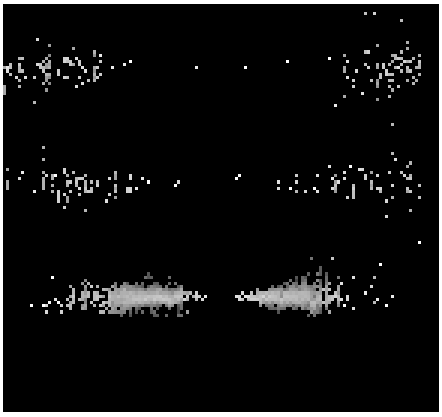
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	244	571	7858	8576	6314	289	163



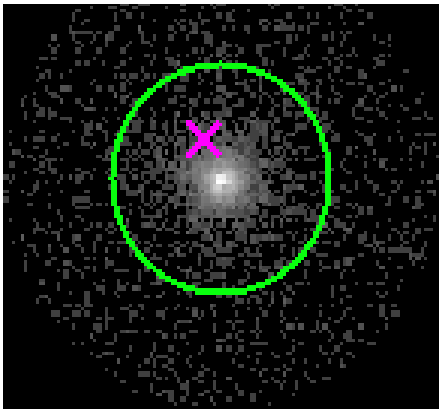

heg order −1
Counts
100
10
1
5
10
15
20
angstroms


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

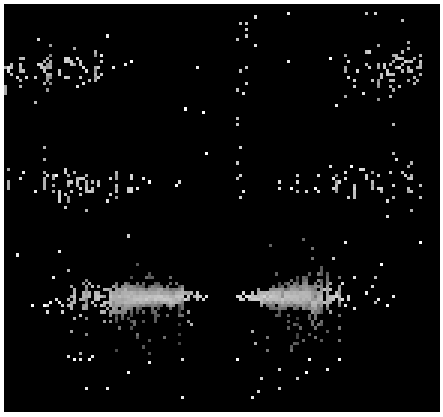
3.2 MEG Arm



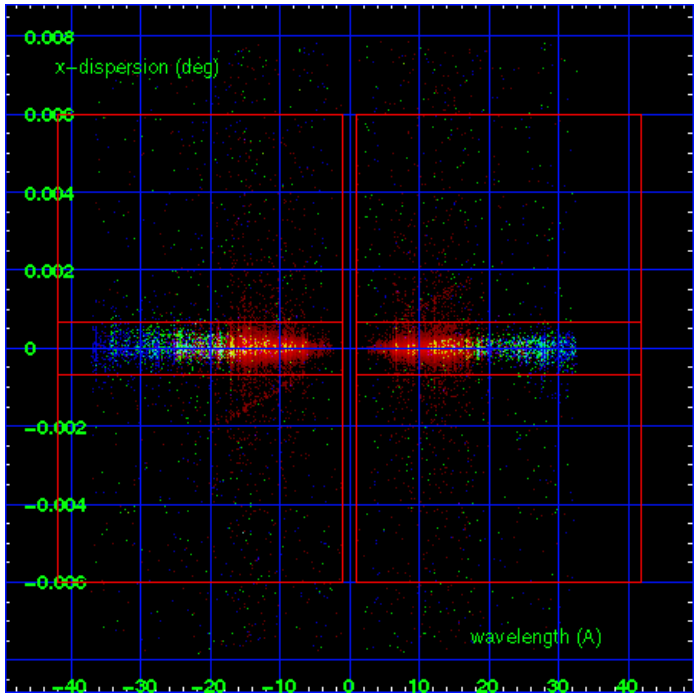
MEG Order Sort 123



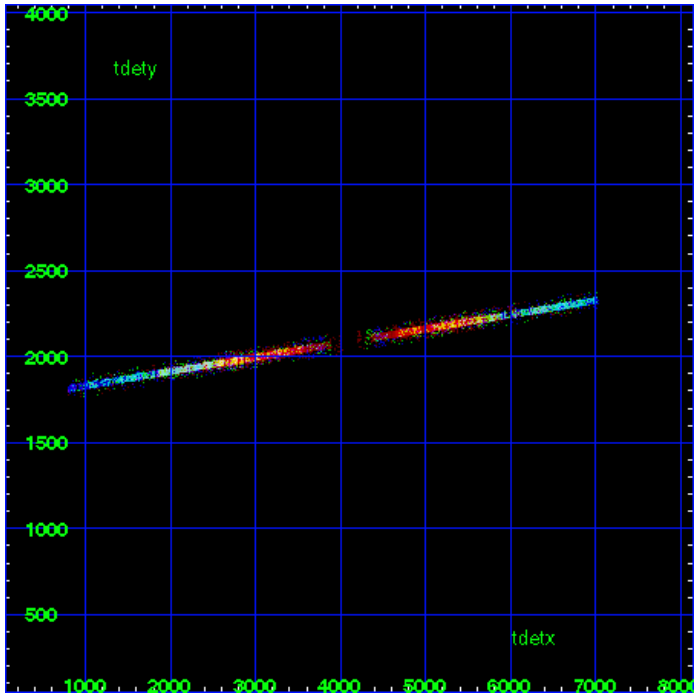
MEG Zero Order



MEG Order Sort ALL

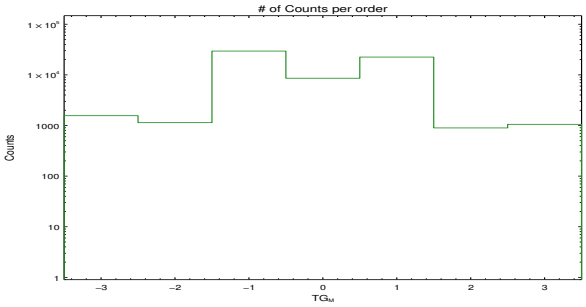


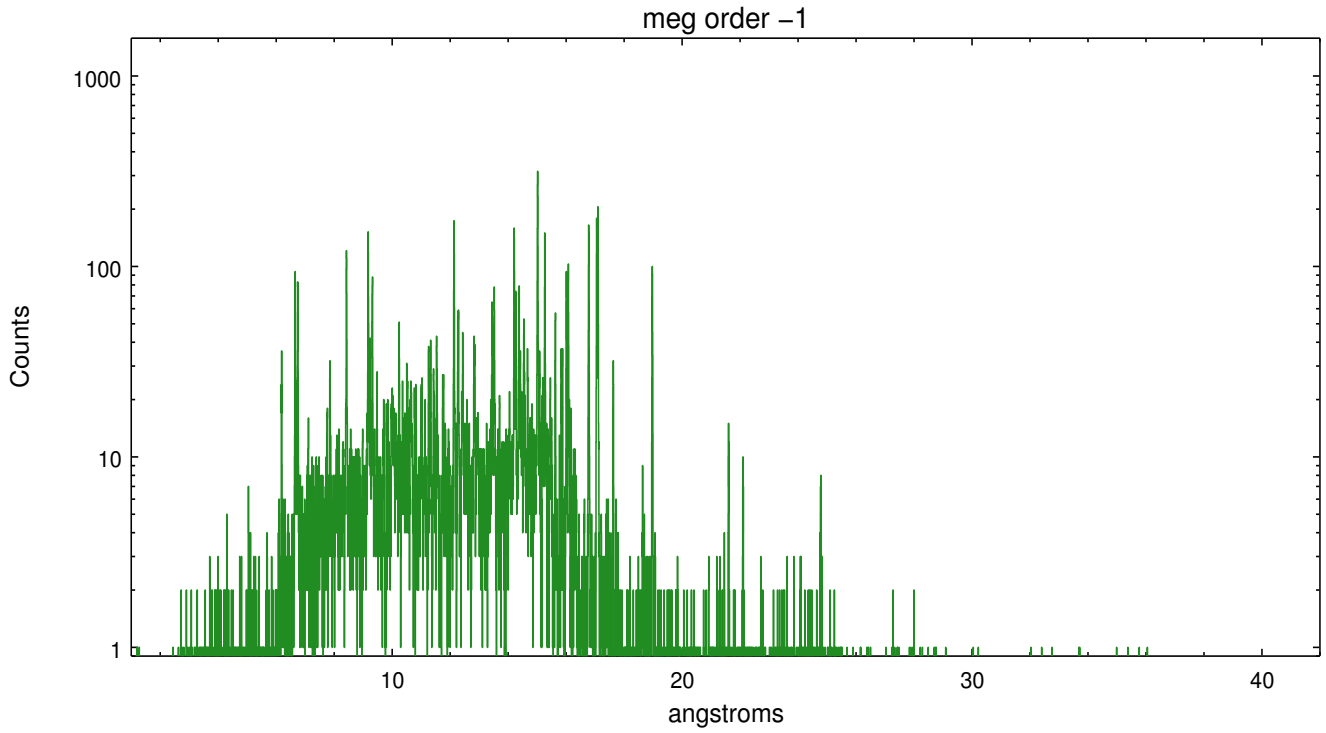
Spot Image MEG

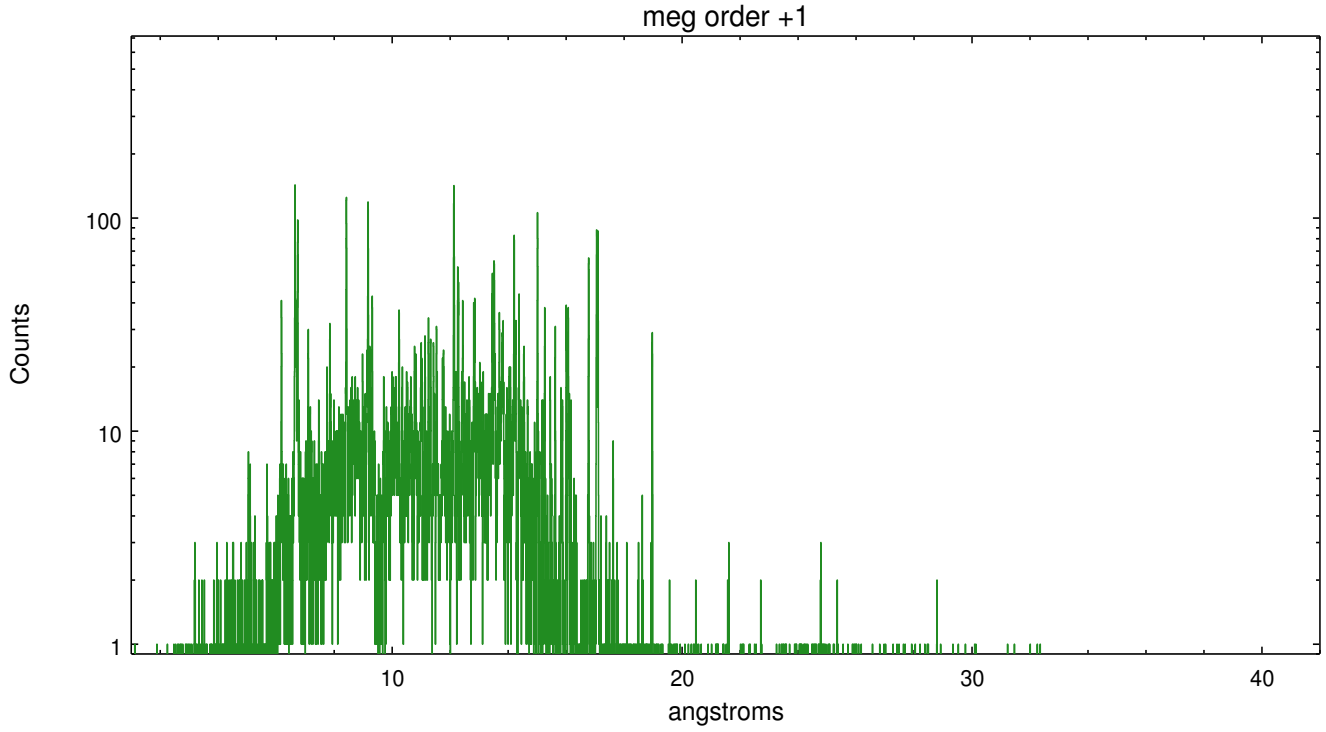


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1562	1138	29506	8576	22467	895	1054




meg order −1
1000
100
10
1
Counts
10
20
30
40
angstroms


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

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.04.04
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.045

A.2 Comments

Zeroth order piled up. Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used to input the correct sky coordinates (x=4100.26, y=4086.16) into the *src1a.fits file table. These corrected coordinates were determined using a software tool developed by CXC called findzero, which is expected to be released in CIAO (currently in ISIS). The tool calculates the point of intersection of the readout streak and the meg arm (preferred position), or the readout streak and the heg arm. The zeroth order source position determined by the standard pipeline processing using the tool tgdetect was not used in this processing. The newly determined zeroth order coordinates have been placed in the *src1a.fits file, replacing the coordinates determined by tgdetect. Note that these corrected coordinates of the zeroth order cannot be reproduced by running tgdetect on the data.