

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 716 - L2 Version 8  
Chandra X-Ray Center

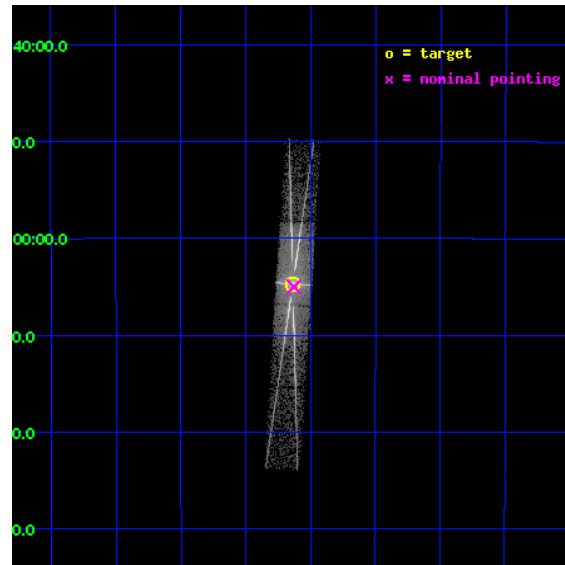
L2 Processing Date : Nov 13 2012

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# 1 Front

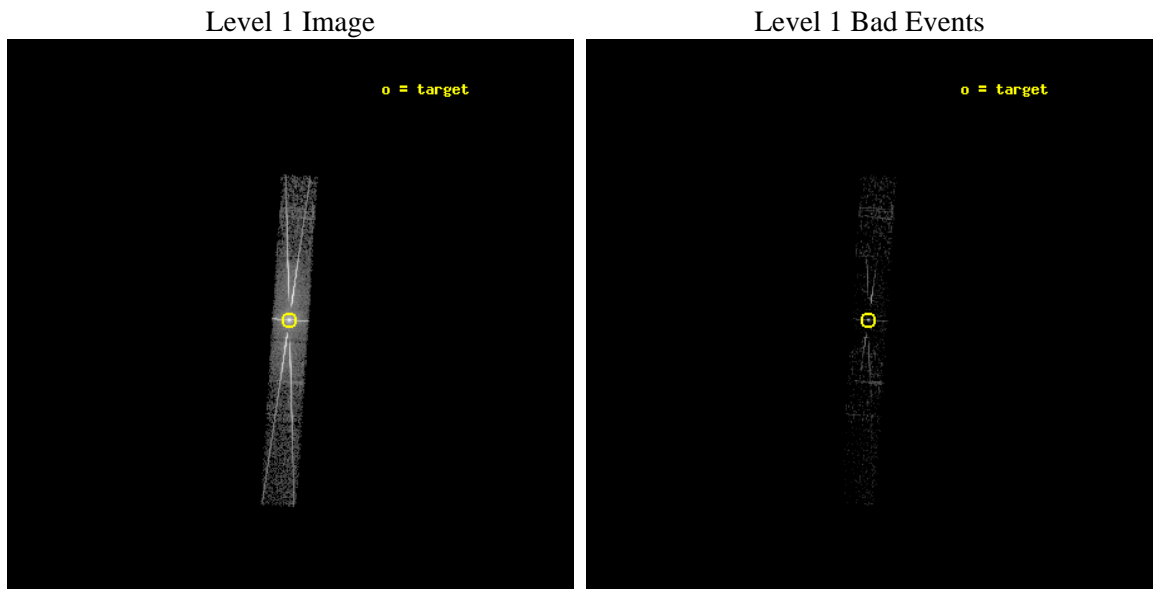
seq_num	400083	Sequence number
obs_id	716	Observation id
title	AXAF GRATING SPECTRA AND PRECISE POSITIONS OF BRIGHT GALACTIC-CENTER X-RAY SOURCES	Proposal title
observer	Dr. Alan Levine	Principal investigator
object	GX 5-1	Source name
dtcycle	0	&#160
cycle	P	events are from which exps? P[rimary] S[econdar]
ra_targ	270.28375	Observer's specified target RA [deg]
dec_targ	-25.079167	Observer's specified target Dec [deg]
ra_nom	270.28212062084	Nominal RA [deg]
dec_nom	-25.083561907991	Nominal Dec [deg]
roll_nom	273.73251388048	Nominal Roll [deg]
revision	8	Processing version of data
ontime	1401.3713802695	Sum of GTIs [s]
livetime	237.9292197225	Livetime [s]
ontime5	1401.3713802695	Sum of GTIs [s]
ontime6	1401.3713802695	Sum of GTIs [s]
ontime7	1401.3713802695	Sum of GTIs [s]
ontime8	1401.3713802695	Sum of GTIs [s]
l2events	83696	Number of level 2 events



## 2 OBI Primary

### 2.1 OBI

#### 2.1.1 Images



### 2.1.2 Parameters

obi_num	1	Obi number	sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	1401.3713802695	Sum of GTIs [s]
caldsver	4.5.1.1	&#160	ontime5	1401.3713802695	Sum of GTIs [s]
date	2012-08-30T18:07:10	Date and time of file creation	ontime6	1401.3713802695	Sum of GTIs [s]
revision	6	Processing version of data	ontime7	1401.3713802695	Sum of GTIs [s]
			ontime8	1401.3713802695	Sum of GTIs [s]
			l1events	97064	Number of level 1 events

### 2.1.3 Events

	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	4267	30579	52441	9777
rejected events	1112	2823	3487	2796
rejected %	26%	9%	6%	28%

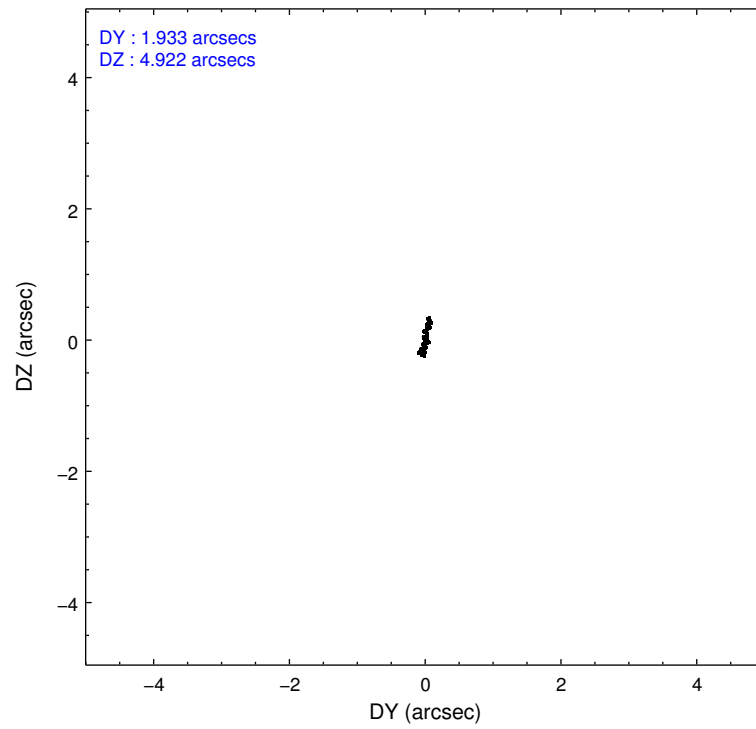
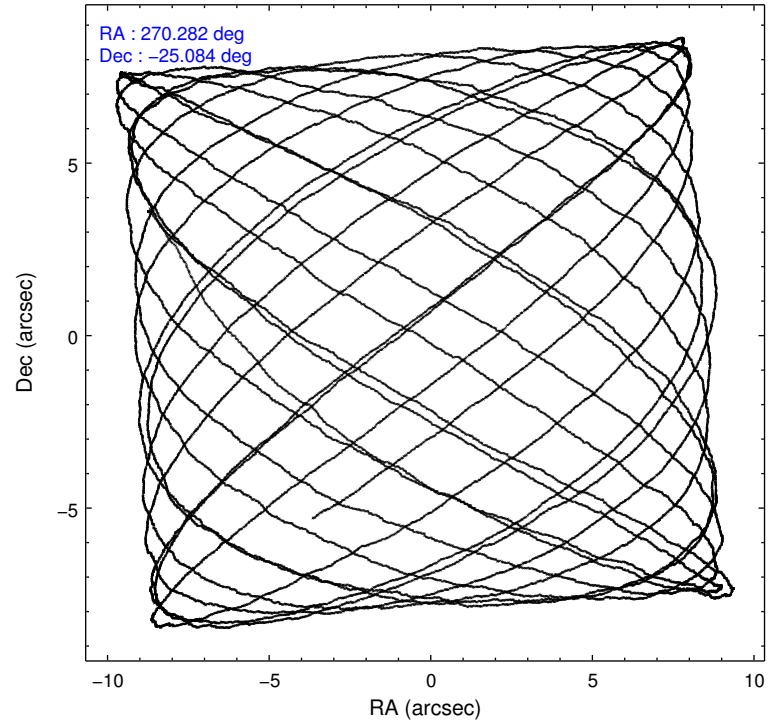
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	558	19713	8315	5040
	13%	64%	15%	51%
grade 1 events	3	231	155	17
	0%	0%	0%	0%
grade 2 events	1126	3807	12512	924
	26%	12%	23%	9%
grade 3 events	227	1253	4869	318
	5%	4%	9%	3%
grade 4 events	238	1272	4922	331
	5%	4%	9%	3%
grade 5 events	140	257	901	72
	3%	0%	1%	0%
grade 6 events	1015	1792	18405	382
	23%	5%	35%	3%
grade 7 events	960	2254	2362	2693
	22%	7%	4%	27%

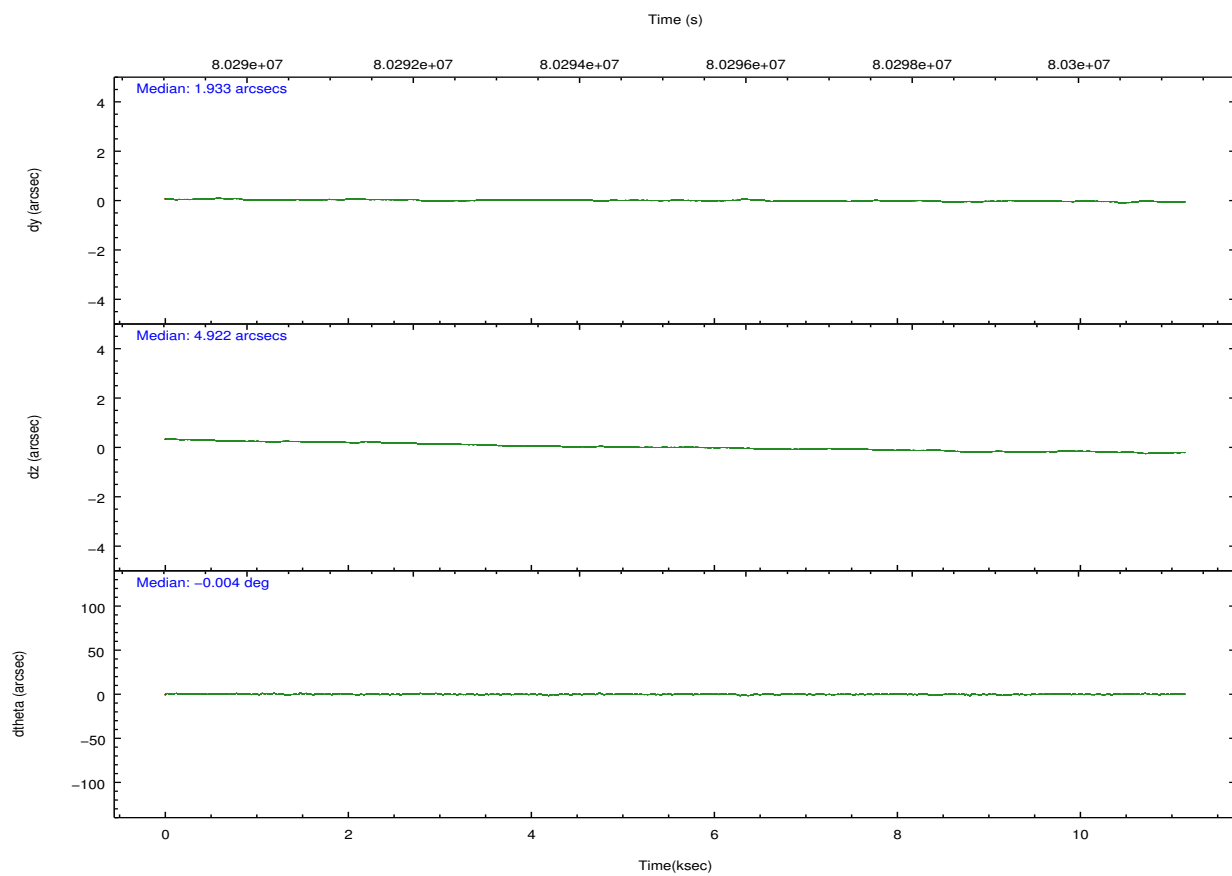
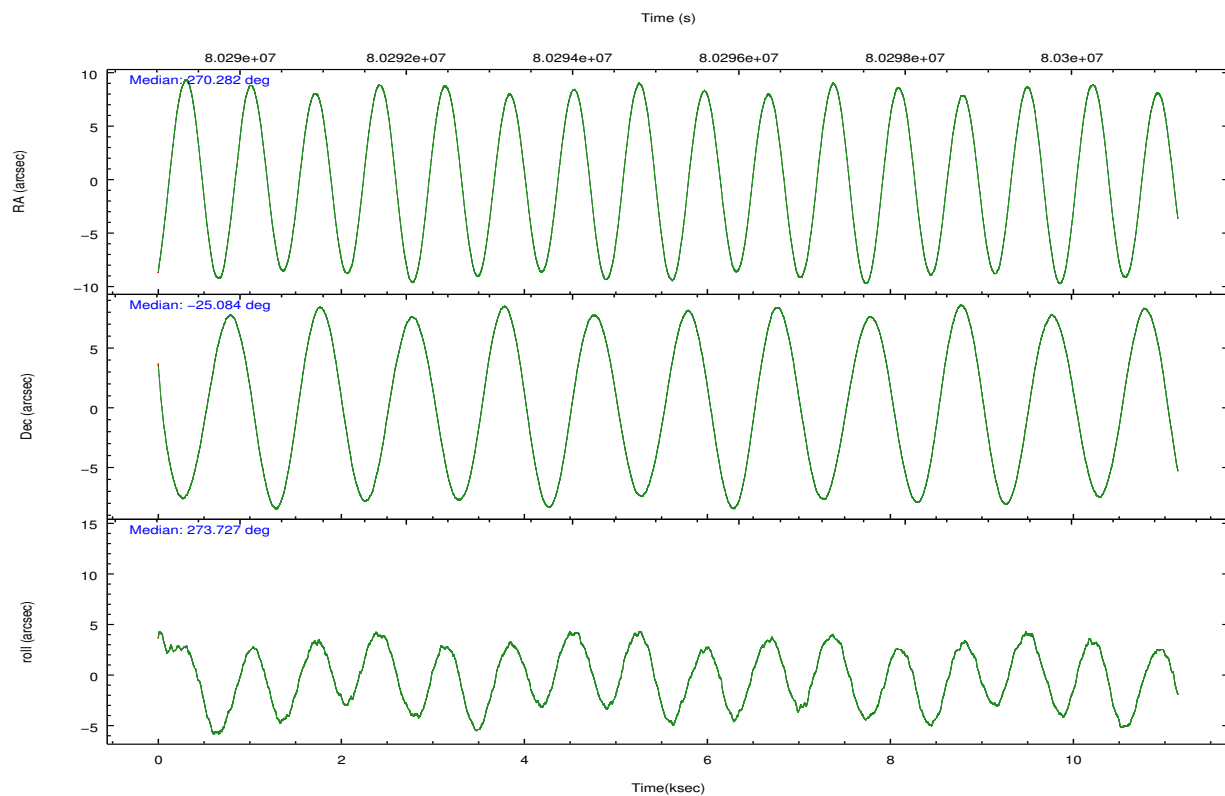


## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-5678	ACIS-5678	Obspar file type	PREDICTED	ACTUAL
Grating	HETG	HETG	Obspar update status	NONE	UPDATED
Data mode	GRADED	GRADED	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	270.265155	270.2821206208428	Subarray requested	CUSTOM	CUSTOM
[deg] Pointing Dec	-25.060847	-25.08356190799104	Subarray start row	15	15
[deg] Pointing Roll	273.568692	273.7325138804774	Subarray row count	440	440
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Alternating exposures requested	Y	Y
[mm] SIM defocus	0	0.001444936568705701	[s] Primary exposure time	0.300000	0.3
[mm] SIM translation stage pos	-183.332523	-183.3237572673427	[s] Secondary exposure time	1.400000	1.4
[mm] SIM translation stage offset	-6.8	-6.808765315665084	Duty cycle	8	8
[s] Observation start time (MET)	80290719.184000	80289195.732317			
Observation start date	2000-07-18T06:57:35	2000-07-18T06:33:15			
[s] Observation end time (MET)	80300719.184000	80301654.60777999			
Observation end date	2000-07-18T09:44:15	2000-07-18T10:00:54			
Read mode	TIMED	TIMED			

## 2.3 Aspect



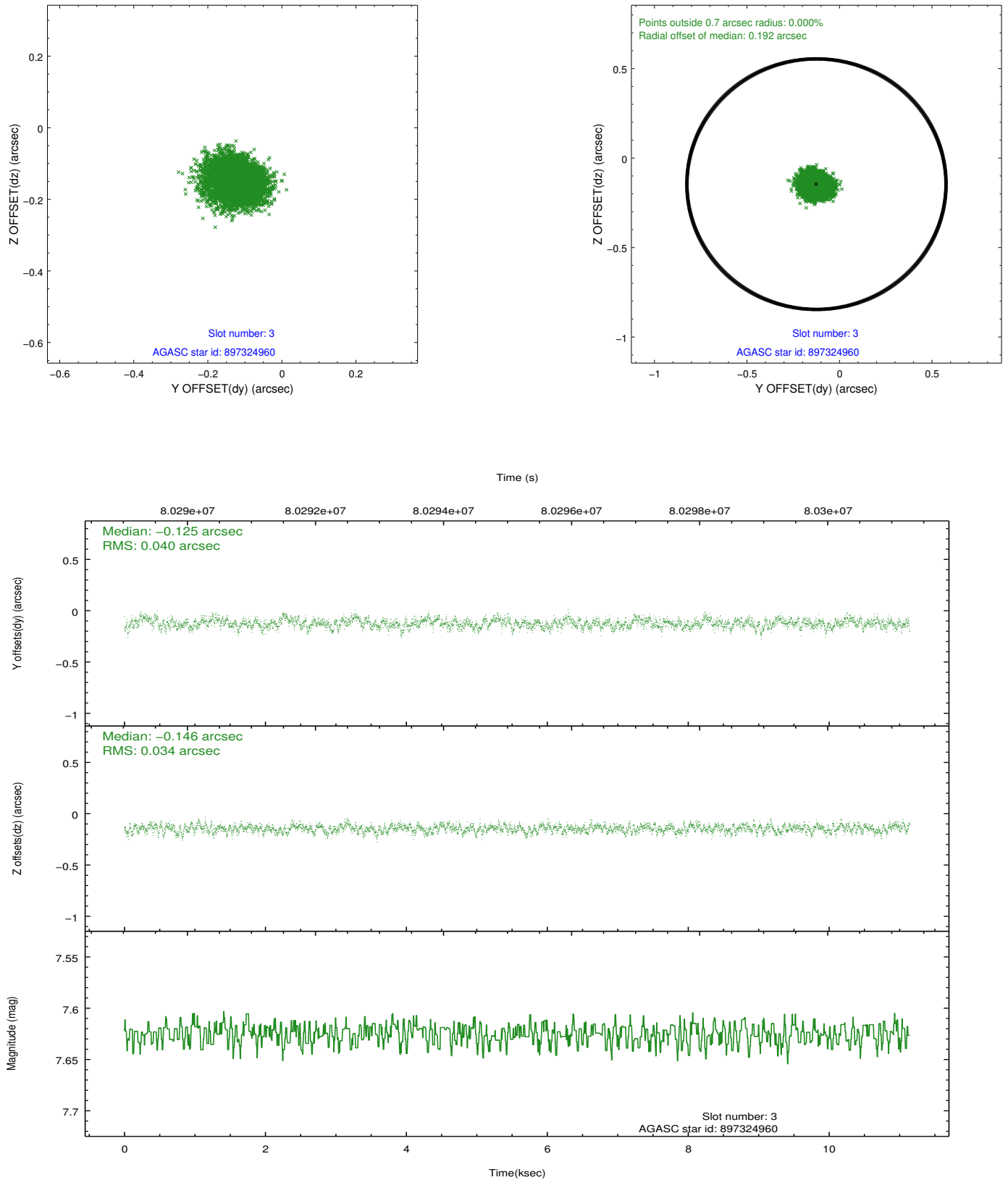


### Slot Statistics

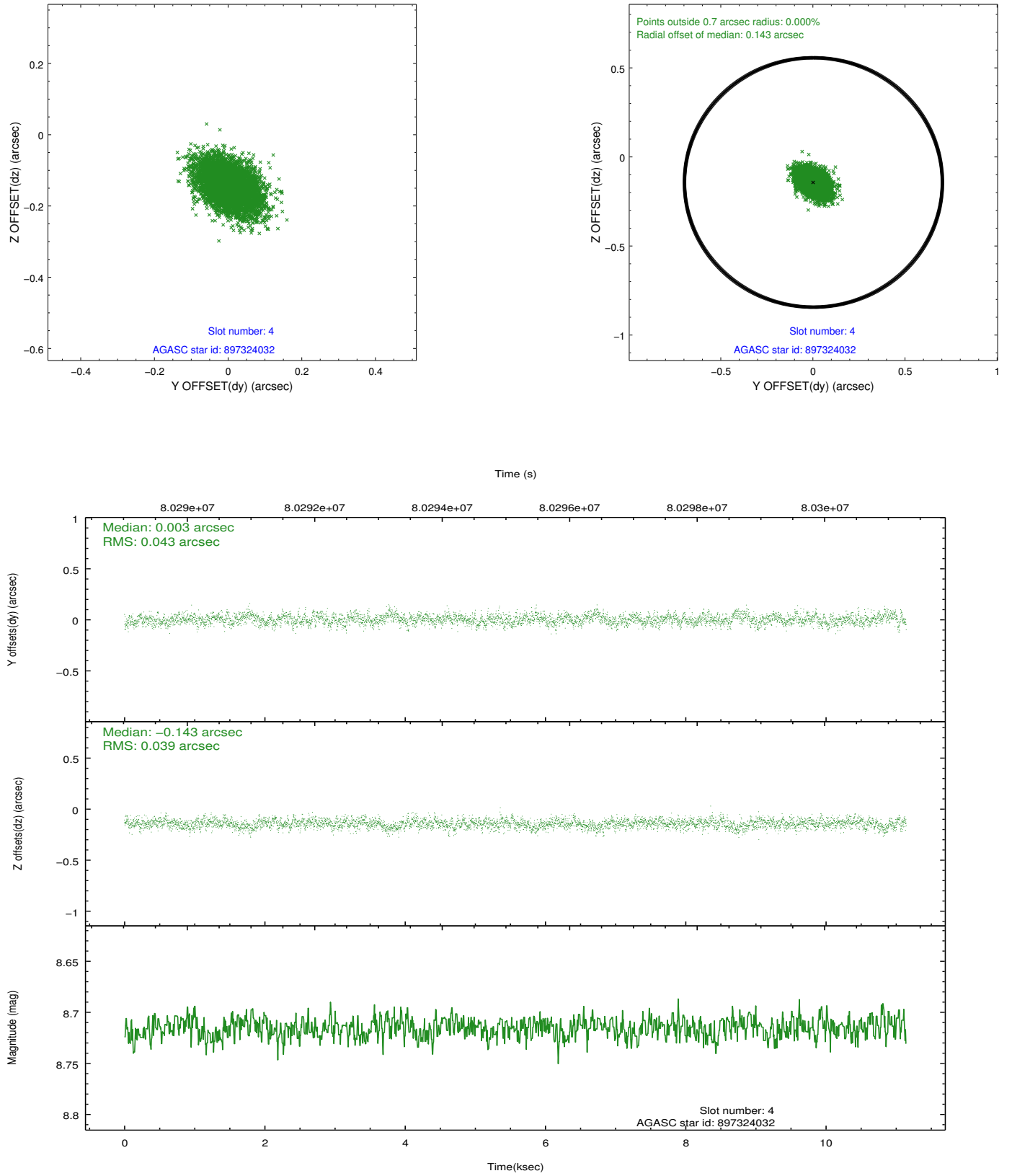
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	2719	-0.050	-0.051	0.008	0.014	0.000000	0.000000	-754.11	-1866.40
1	FID	ACIS-S-4	7.19	2719	0.040	0.038	0.006	0.010	0.000000	0.000000	2159.05	41.63
2	FID	ACIS-S-5	7.23	2719	-0.020	0.021	0.007	0.014	0.000000	0.000000	-1806.33	35.81
3	GUIDE	897324960	7.62	5437	-0.125	-0.146	0.055	0.090	270.333871	-24.632185	-1526.13	320.61
4	GUIDE	897324032	8.72	5437	0.003	-0.143	0.060	0.103	270.314237	-25.107248	176.57	149.64
5	GUIDE	897188632	8.63	5435	-0.017	0.043	0.069	0.115	269.725883	-25.281908	688.87	-1801.25
6	GUIDE	897321504	8.81	5435	-0.057	0.088	0.069	0.119	270.176705	-24.677132	-1396.36	-202.77
7	GUIDE	897321032	9.38	5434	0.195	0.160	0.090	0.146	270.974244	-25.549551	1905.31	2189.52

## 2.4 Star Slots

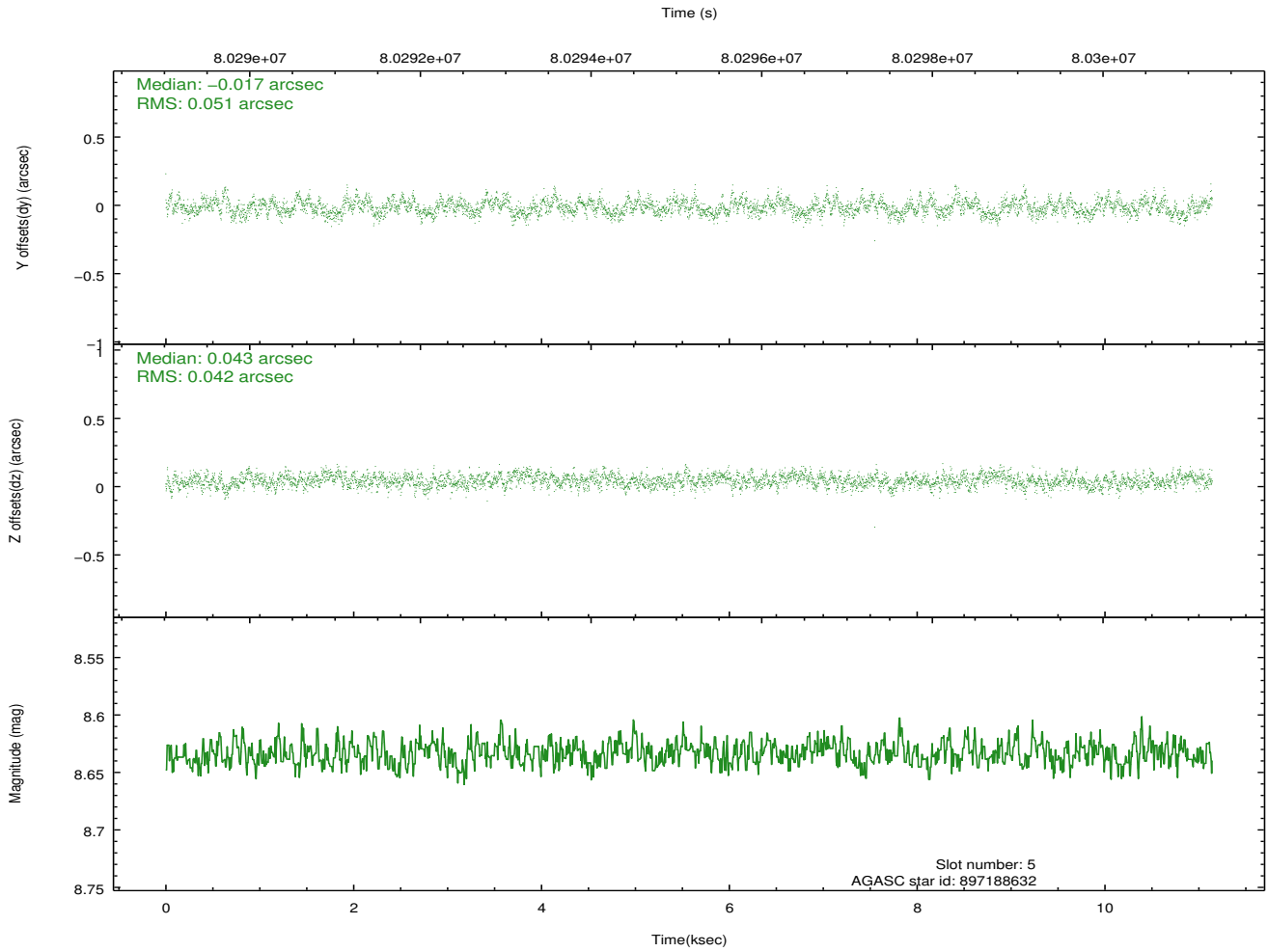
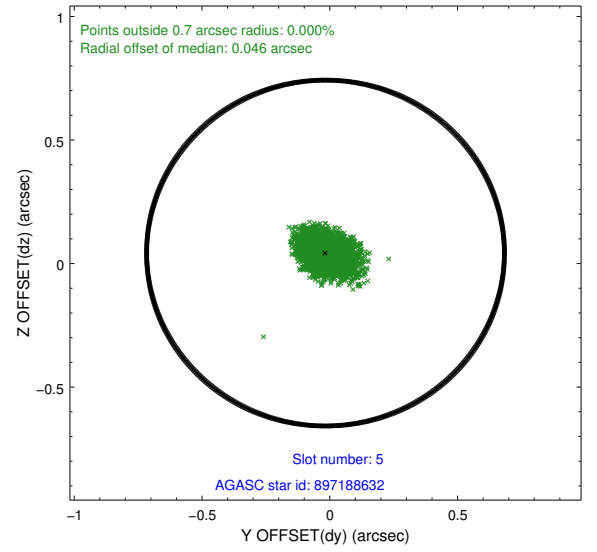
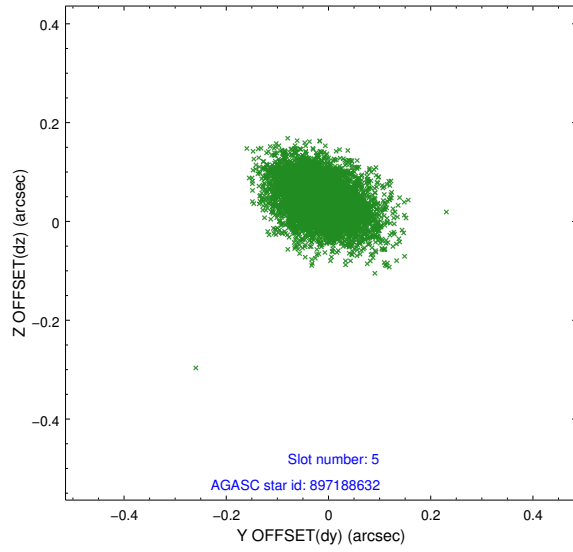
### 2.4.1 Slot 3



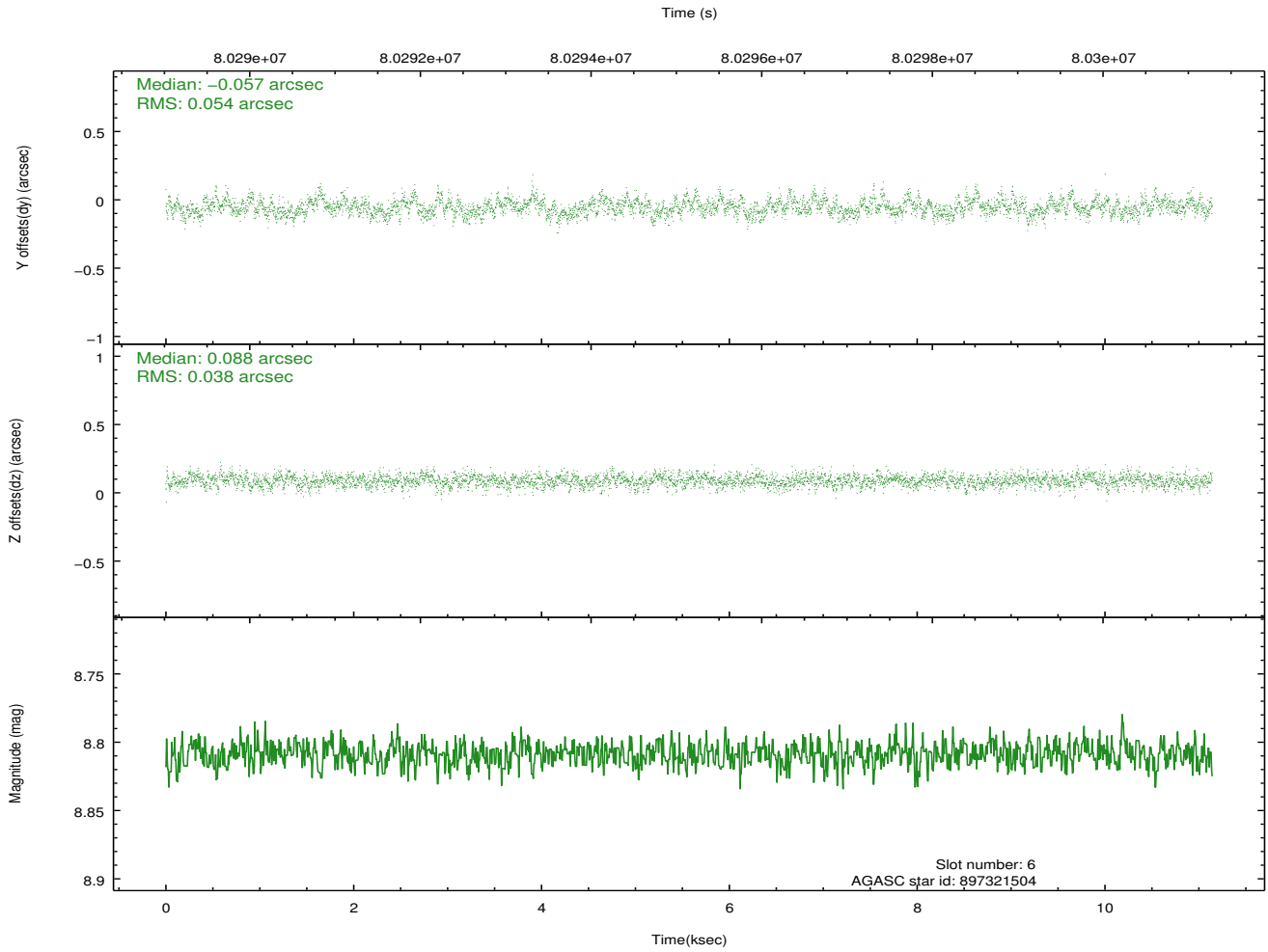
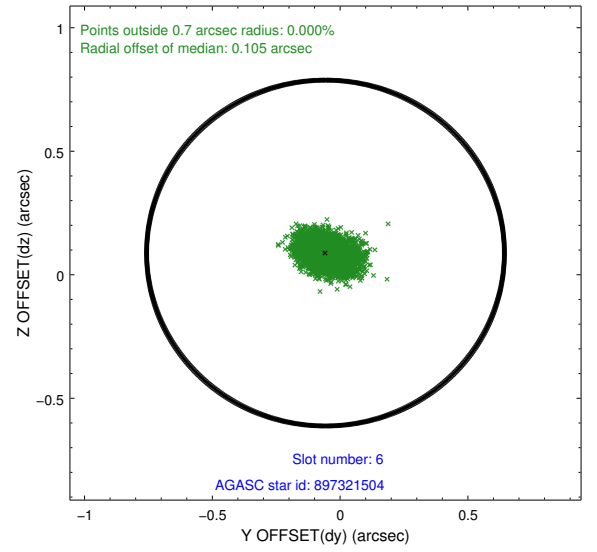
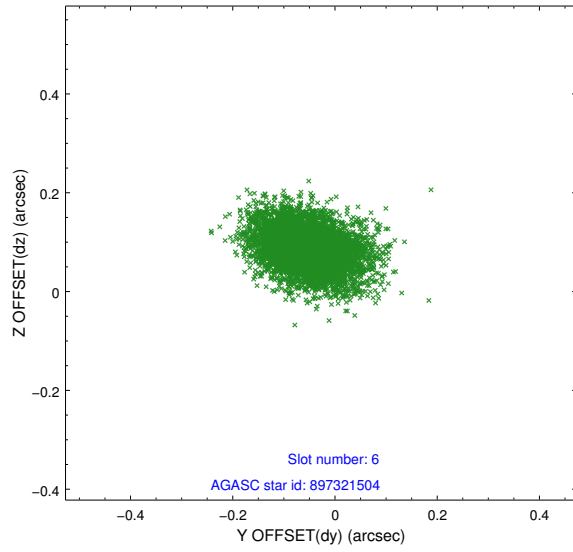
## 2.4.2 Slot 4



### 2.4.3 Slot 5

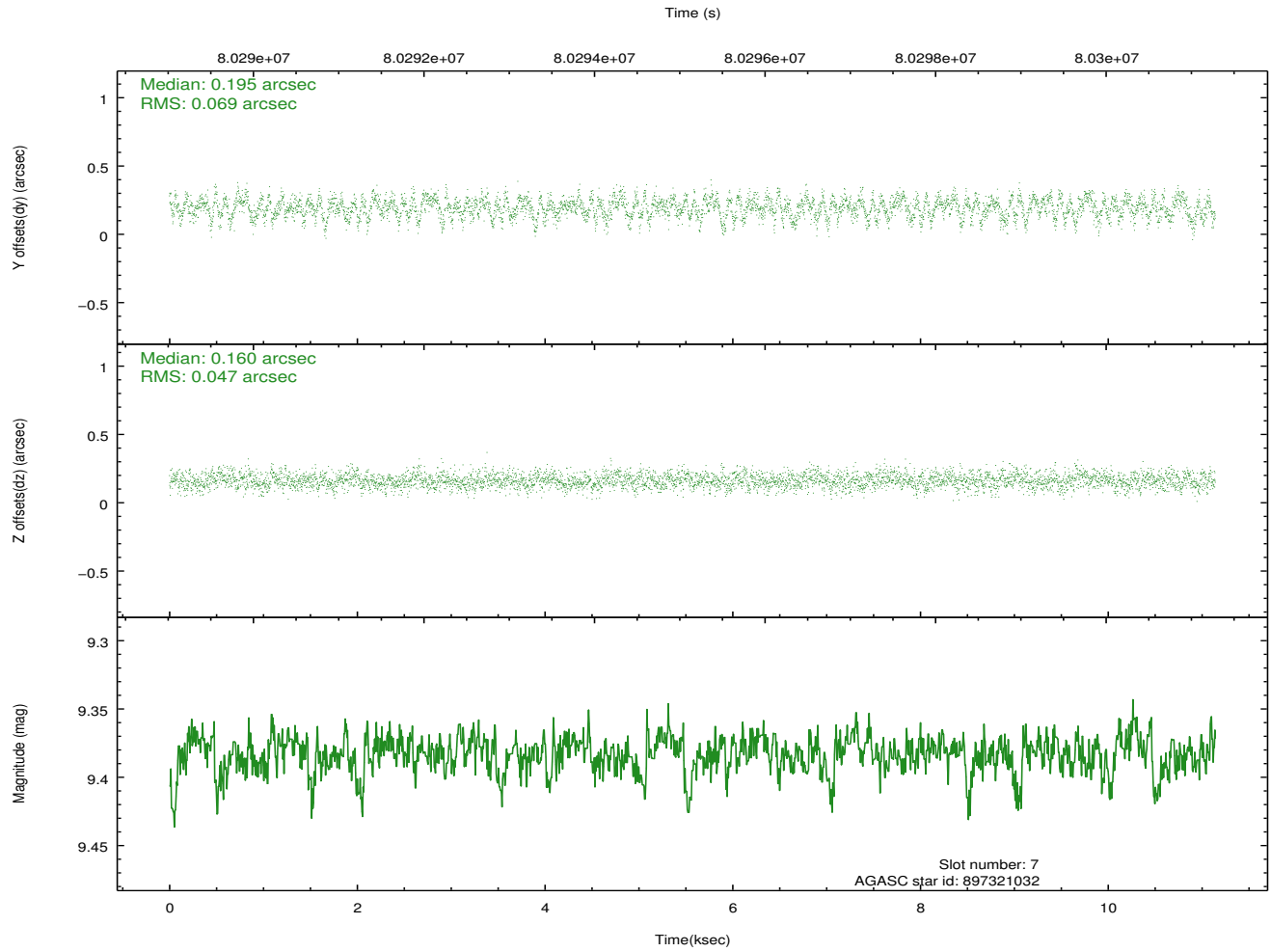
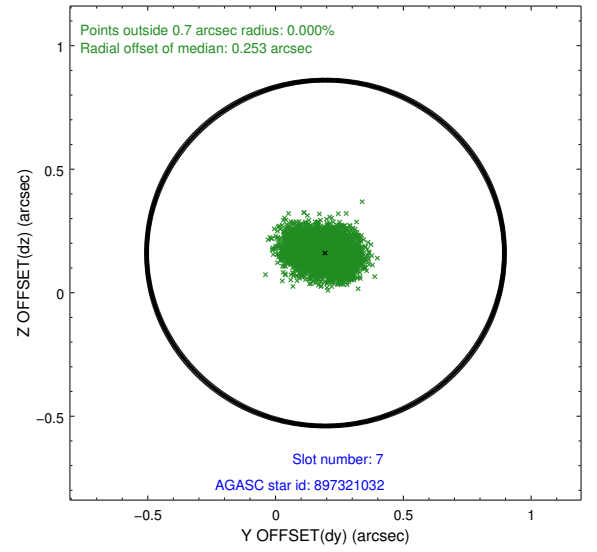
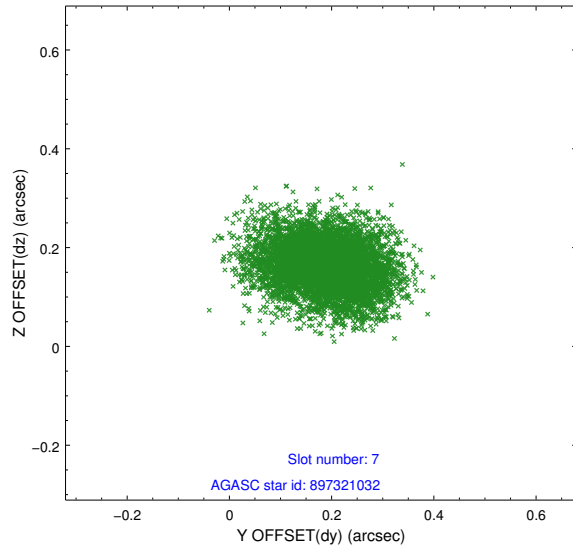


## 2.4.4 Slot 6



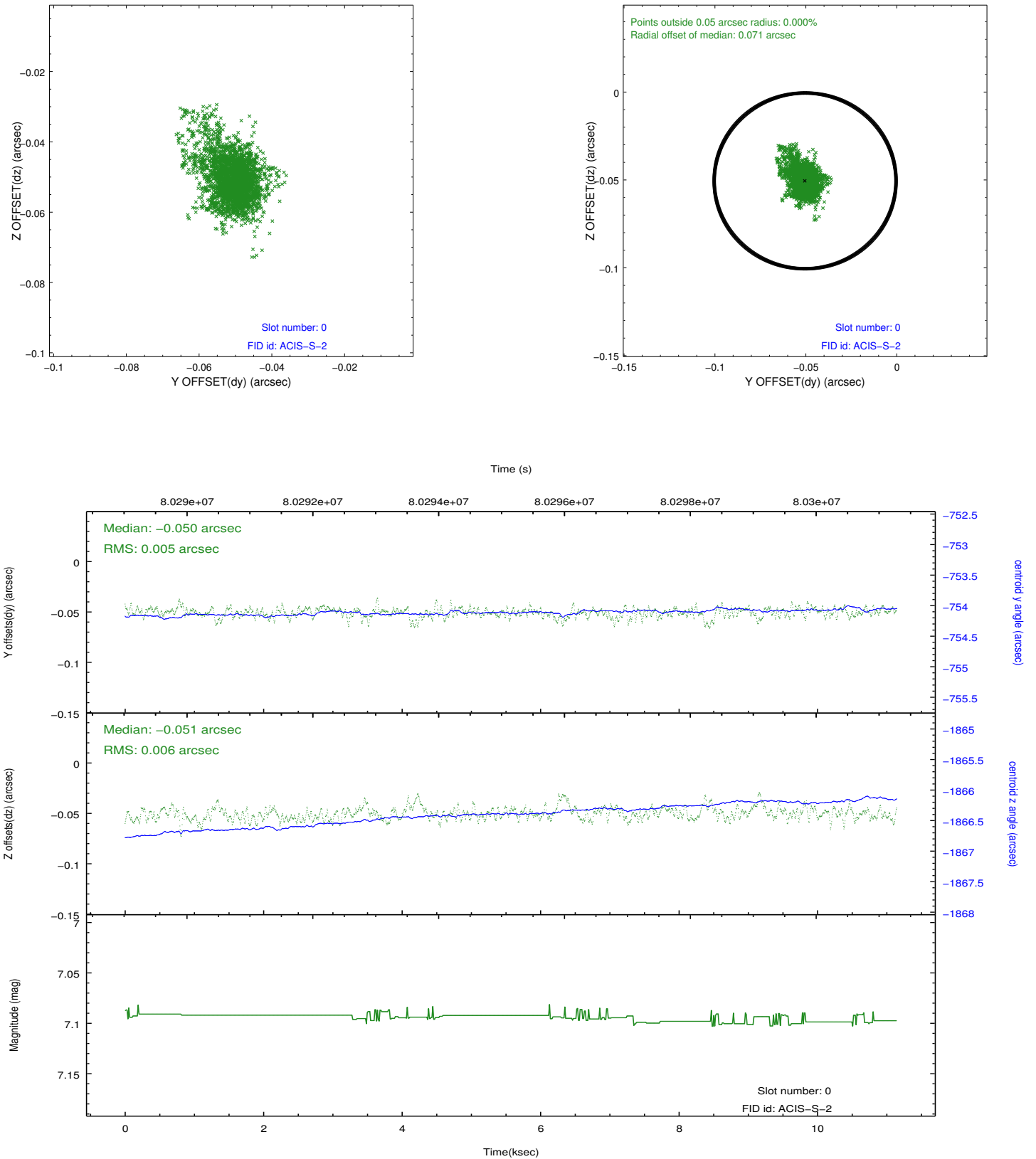


## 2.4.5 Slot 7

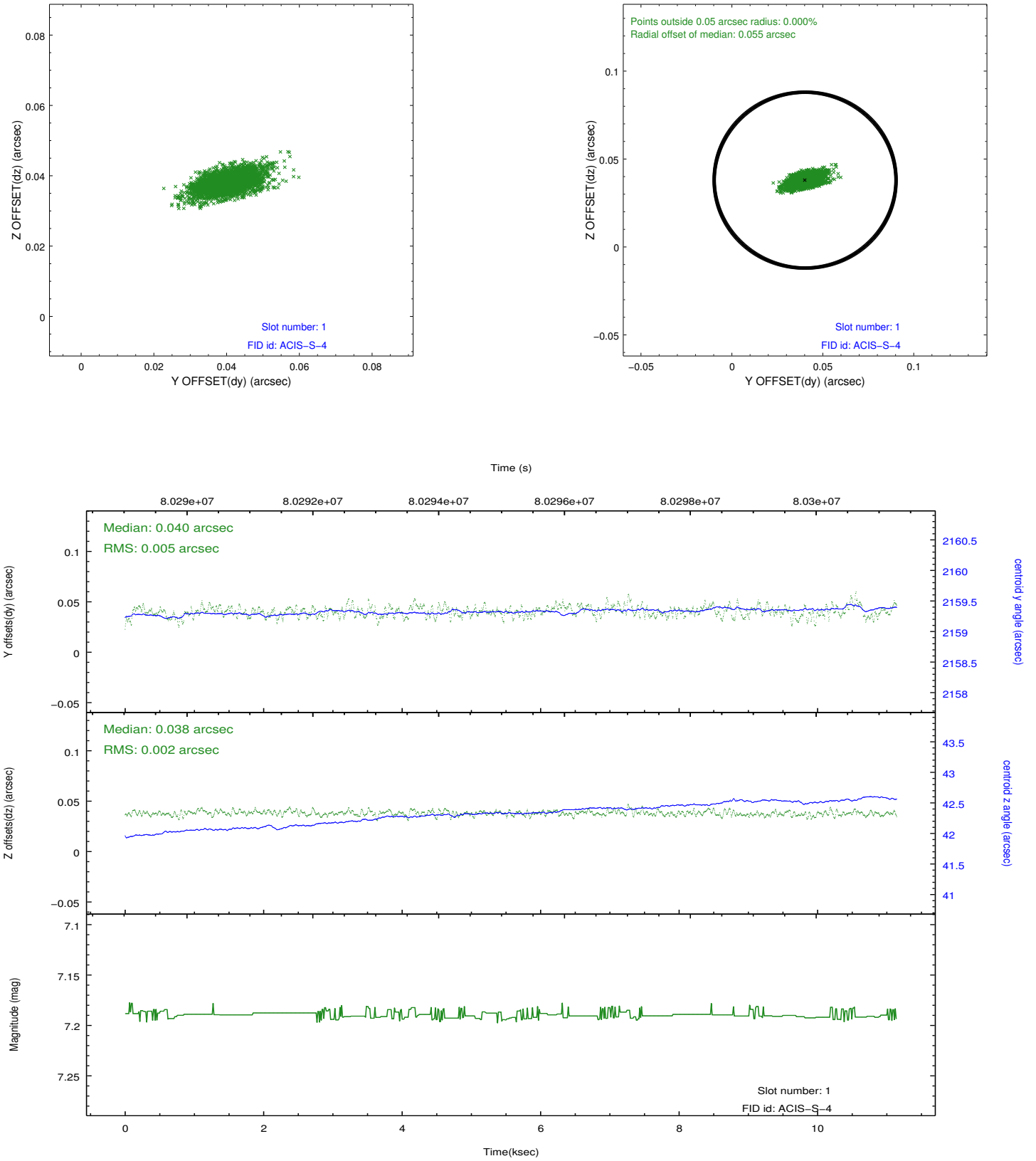


## 2.5 FID Slots

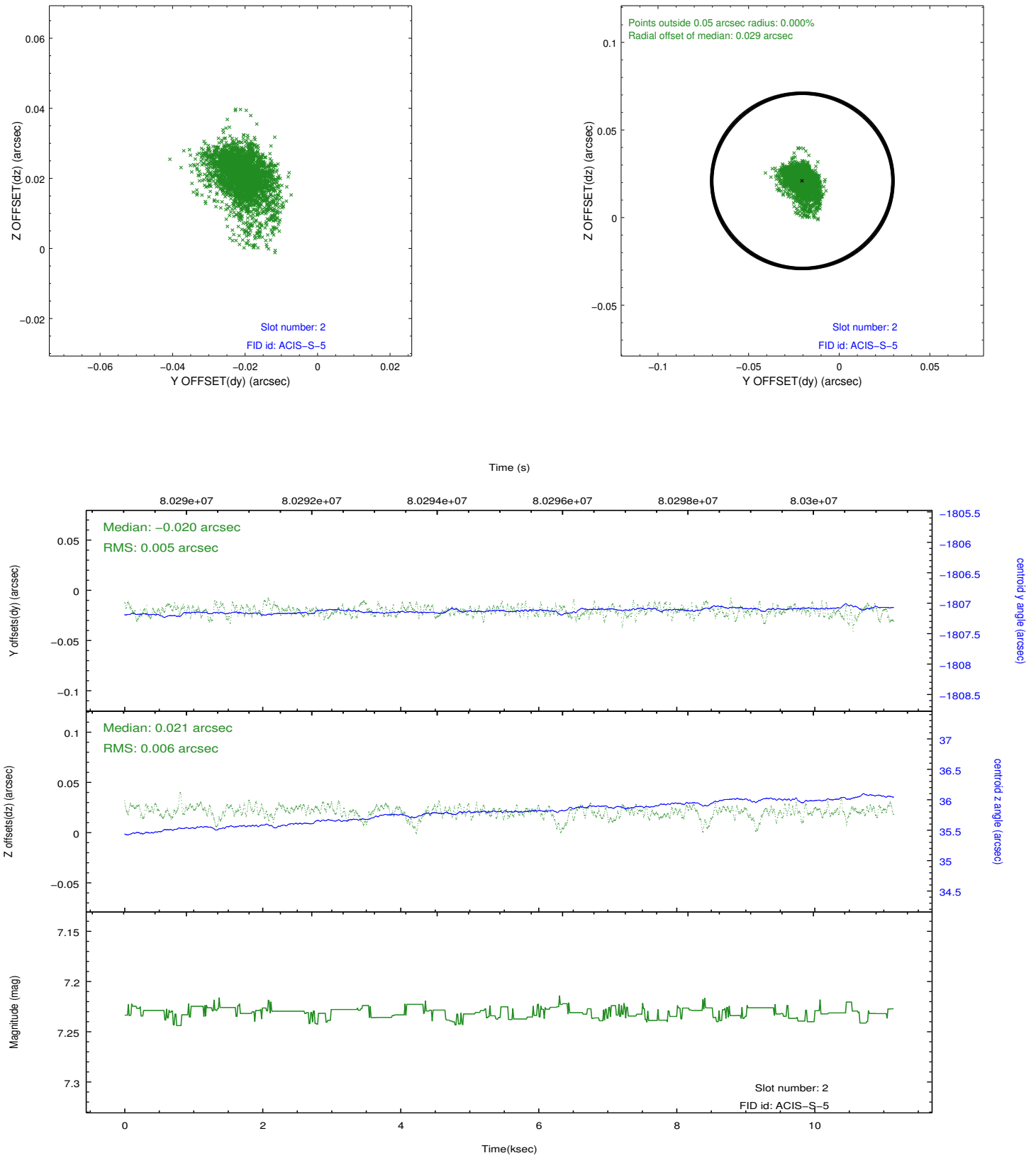
### 2.5.1 Slot 0



## 2.5.2 Slot 1



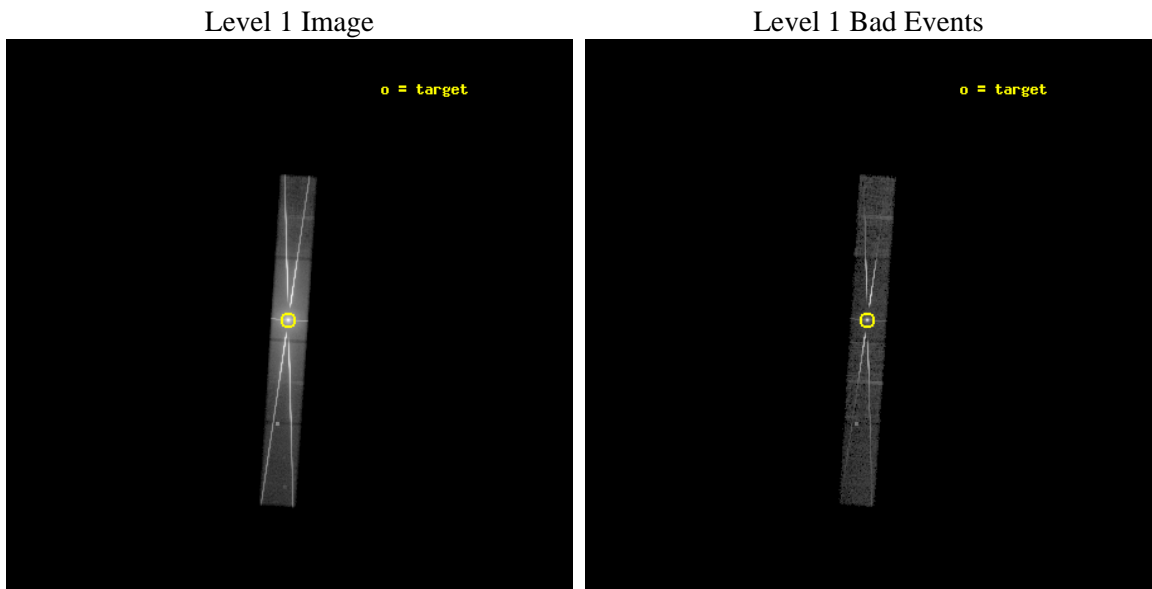
### 2.5.3 Slot 2



## 3 OBI Secondary

### 3.1 OBI

#### 3.1.1 Images



### 3.1.2 Parameters

obi_num	1	Obi number	sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	9170.8979477882	Sum of GTIs [s]
caldsver	4.5.1.1	&#160	ontime5	9170.8972301781	Sum of GTIs [s]
date	2012-08-30T19:06:28	Date and time of file creation	ontime6	9170.8973299116	Sum of GTIs [s]
revision	6	Processing version of data	ontime7	9170.8979477882	Sum of GTIs [s]
			ontime8	9170.8980280161	Sum of GTIs [s]
			l1events	2902631	Number of level 1 events

### 3.1.3 Events

	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	128965	940255	1563383	270028
rejected events	20587	88121	189859	31196
rejected %	15%	9%	12%	11%

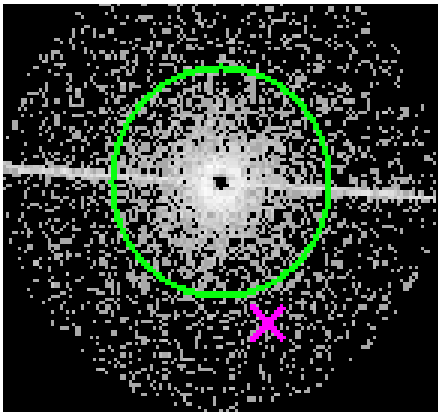
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	22695	579420	222824	175783
	17%	61%	14%	65%
grade 1 events	519	26138	10301	1786
	0%	2%	0%	0%
grade 2 events	37691	123028	340266	29511
	29%	13%	21%	10%
grade 3 events	8417	46563	132879	11056
	6%	4%	8%	4%
grade 4 events	8039	45027	131210	10891
	6%	4%	8%	4%
grade 5 events	3501	24231	52771	2268
	2%	2%	3%	0%
grade 6 events	31565	58368	546796	11691
	24%	6%	34%	4%
grade 7 events	16538	37480	126336	27042
	12%	3%	8%	10%

# 4 Gratings

## 4.1 HEG Arm



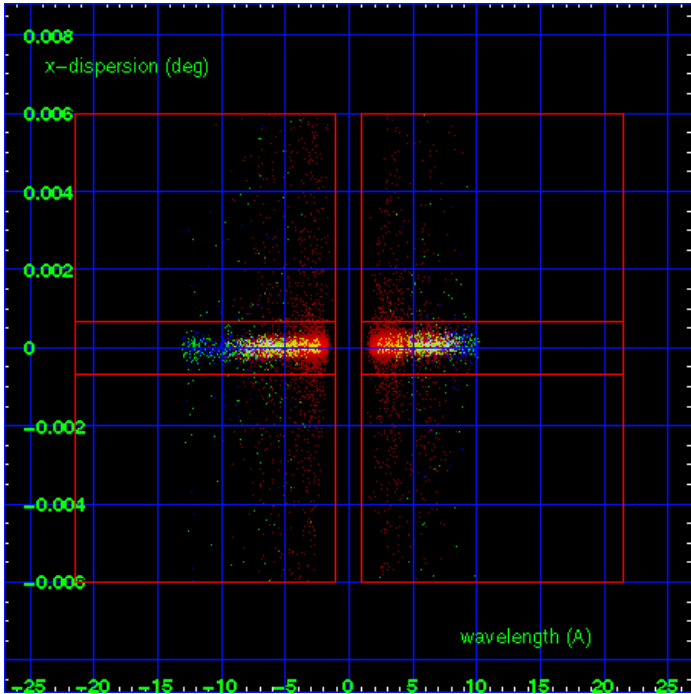
HEG Order Sort 123



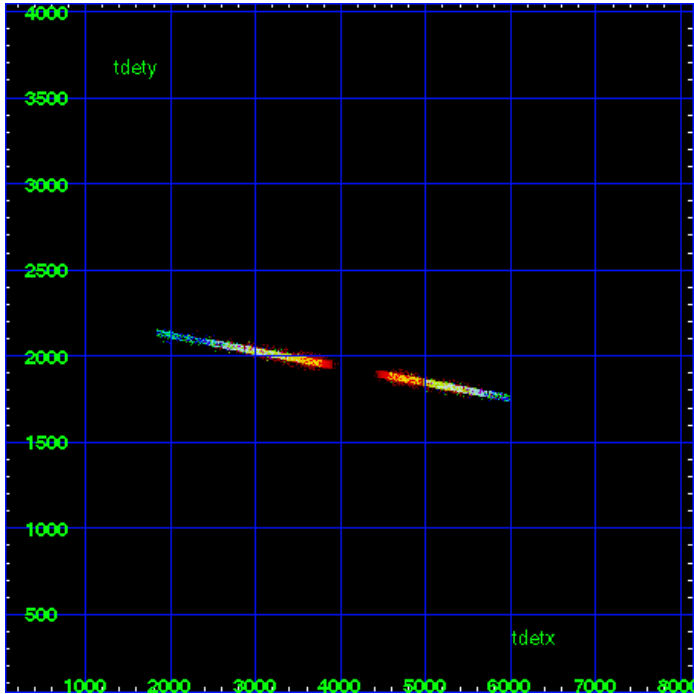
HEG Zero Order



HEG Order Sort ALL

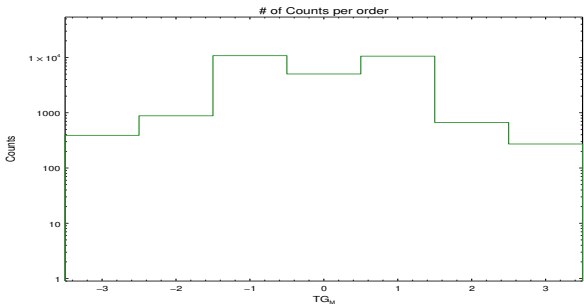


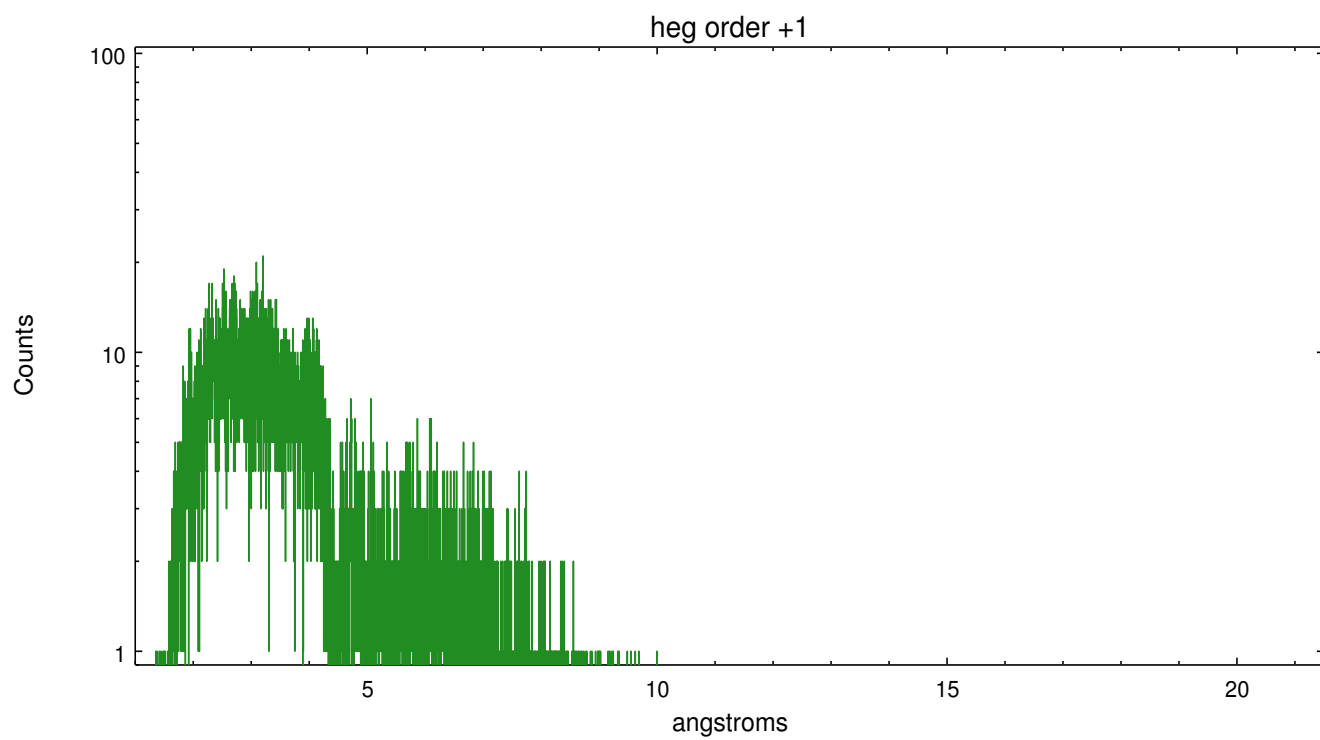
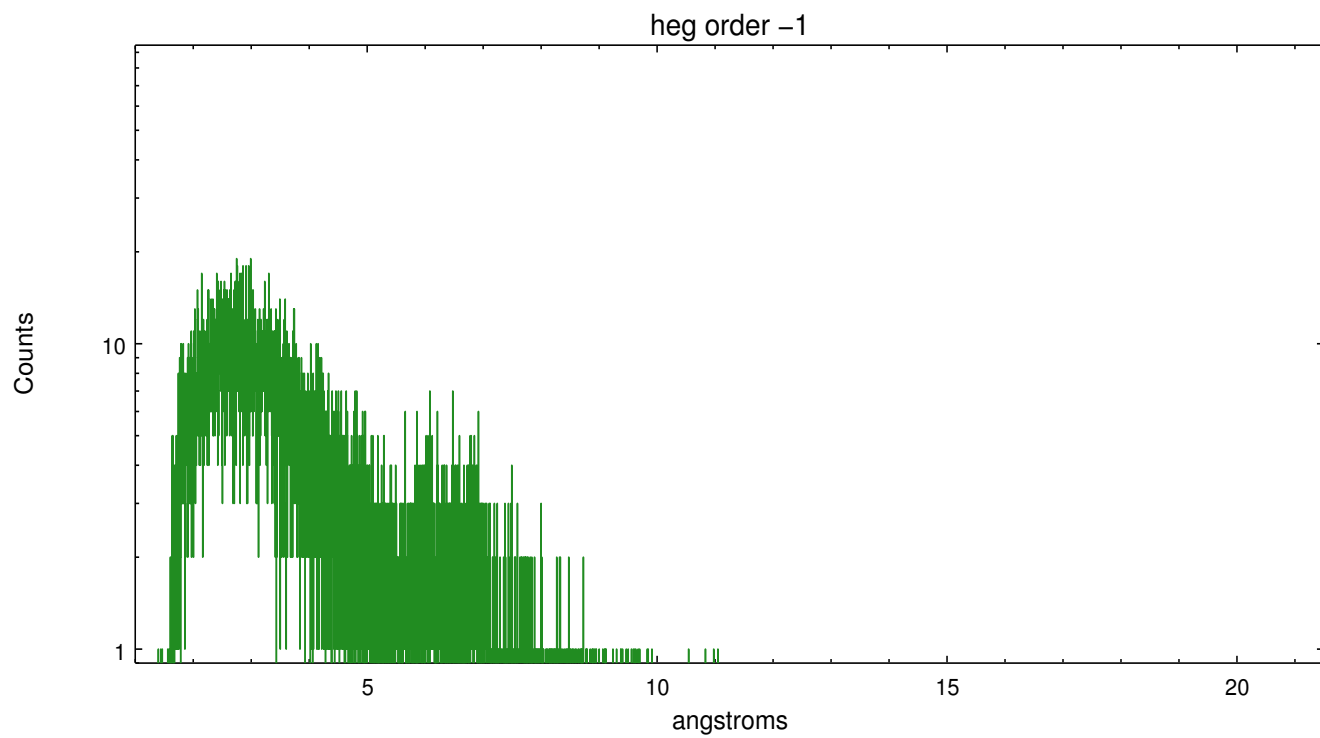
Spot Image HEG



Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	390	881	10792	5033	10572	668	272



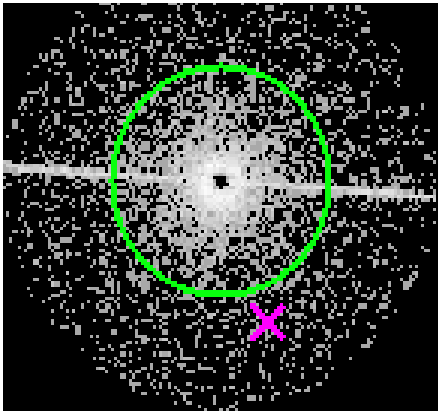




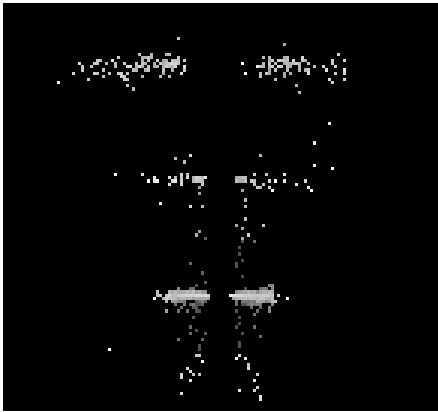
4.2 MEG Arm



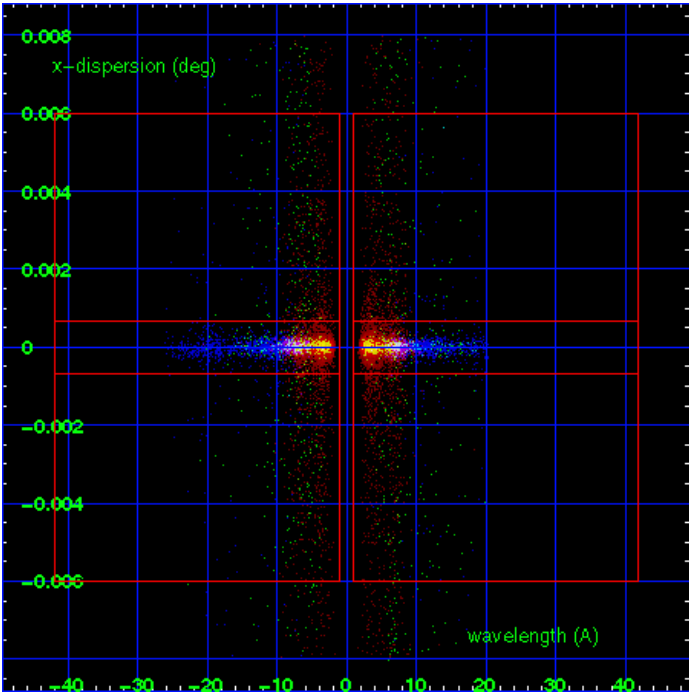
MEG Order Sort 123



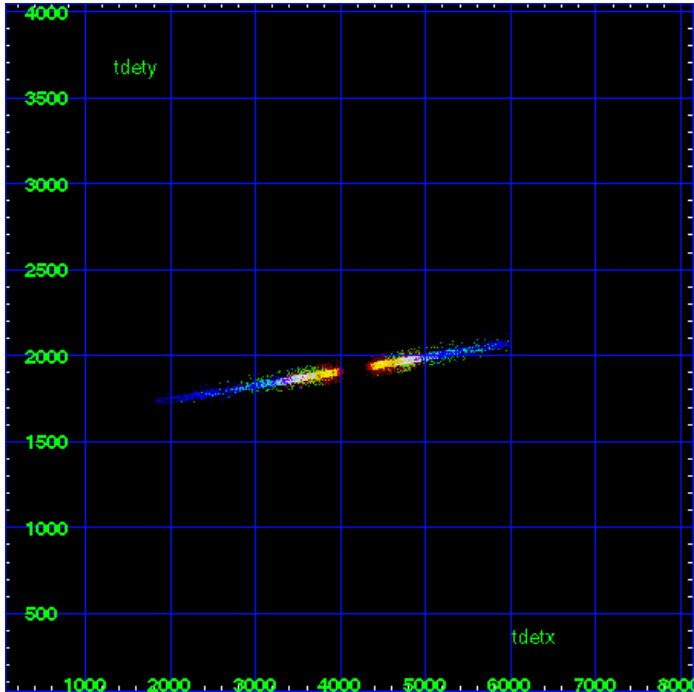
MEG Zero Order



MEG Order Sort ALL

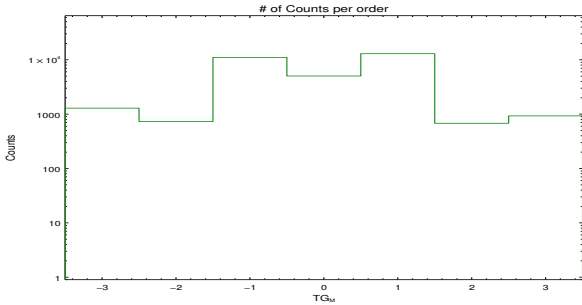


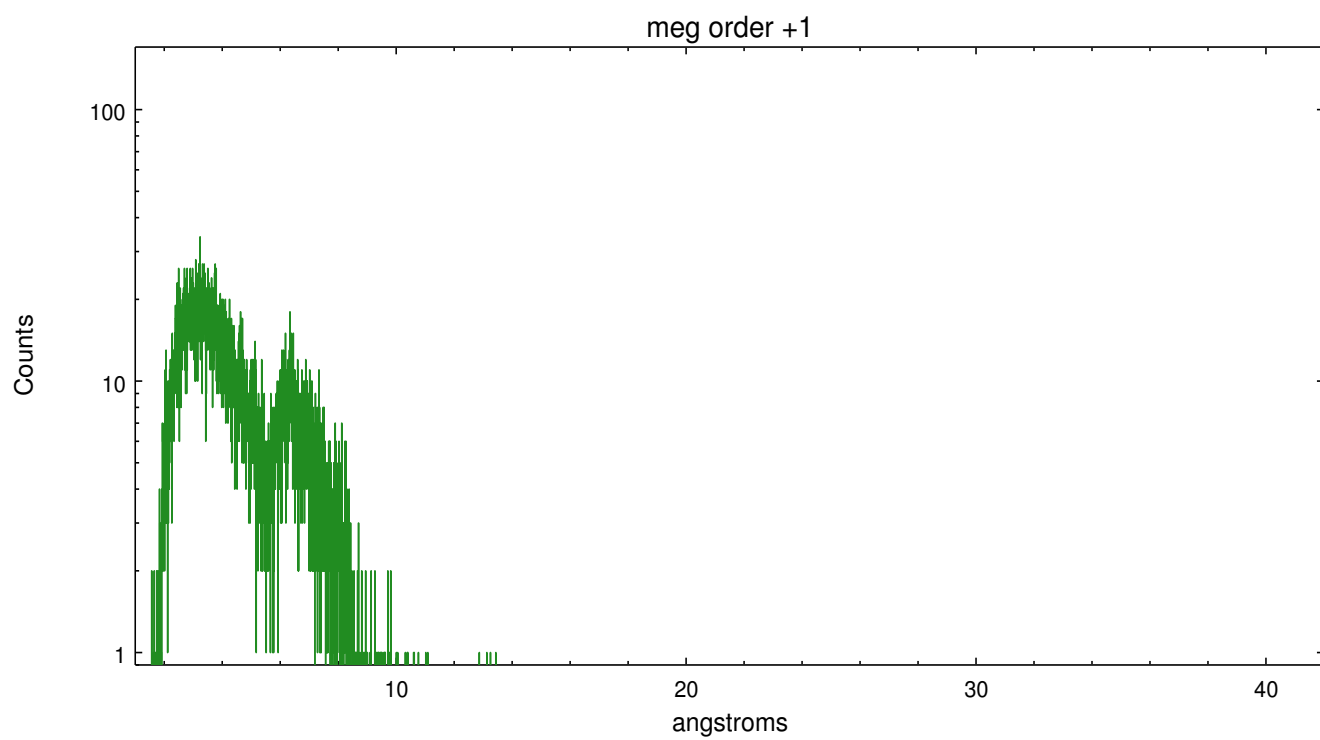
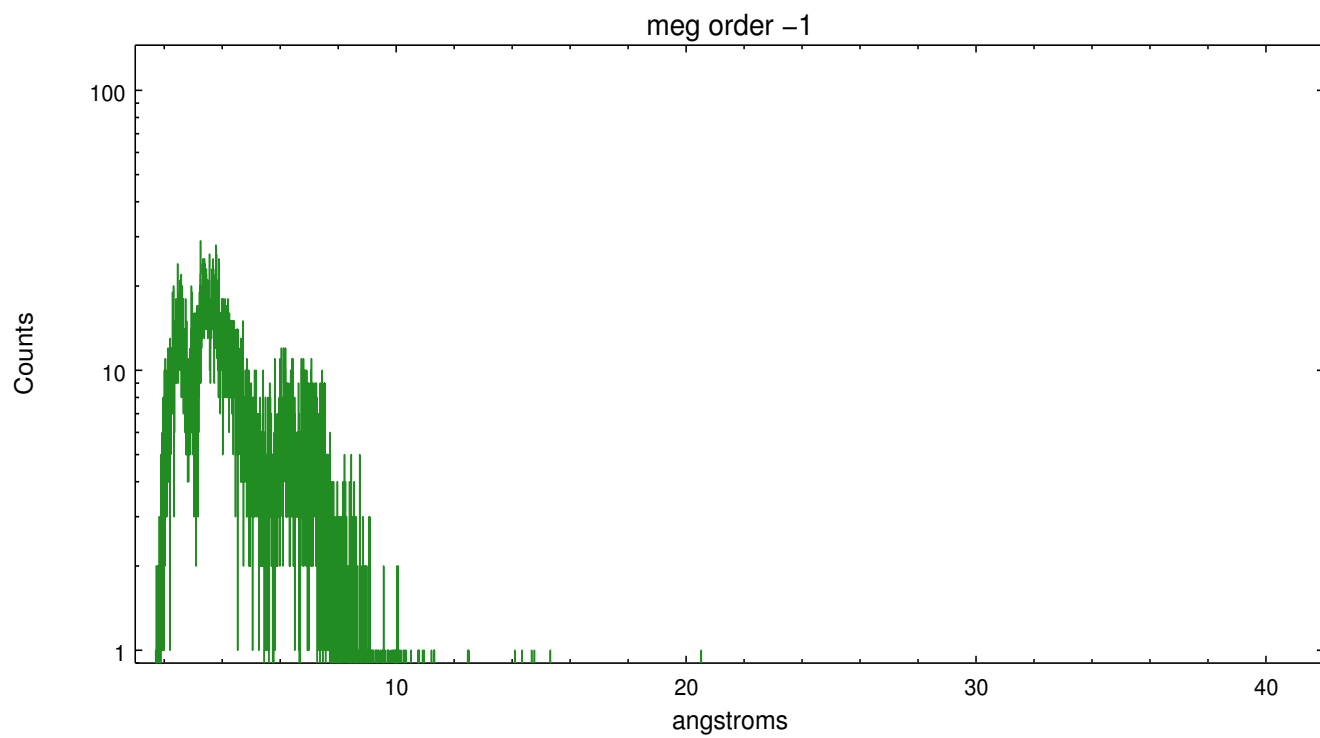
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1289	732	11063	5033	12956	679	929





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.12.17
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	10.573

## A.2 Comments

This is an interleaved-mode observation. The primary exposure (e1) is shorter than the secondary exposure (e2). Therefore the longer exposure was used to determine the zeroth order position, then that position was applied to both exposures. === For e2 exposure, to determine the zeroth order position:=== Zeroth order piled up and cratered. Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used to input the correct sky coordinates (sky coordinates x=4082.35, y=4134.48) into the \*src1a.fits file table. These corrected coordinates were determined using a software tool developed by CXC called tg\_findzo, available in CIAO. The tool calculates the point of intersection of the readout streak and the meg 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. === For e1 exposure: Zeroth order is also piled up and cratered. However, it is important that the zeroth order positions of e1 and e2 be identical, so the e2 position was manually inserted in the \*src1a.fits file. === Faint grating spectra can be seen in the image of bad events for both e1 and e2. This is probably due to pileup in the spectrum, causing migration to bad grades. This should be considered in analysis.