

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 11605 - L2 Version 2  
Chandra X-Ray Center

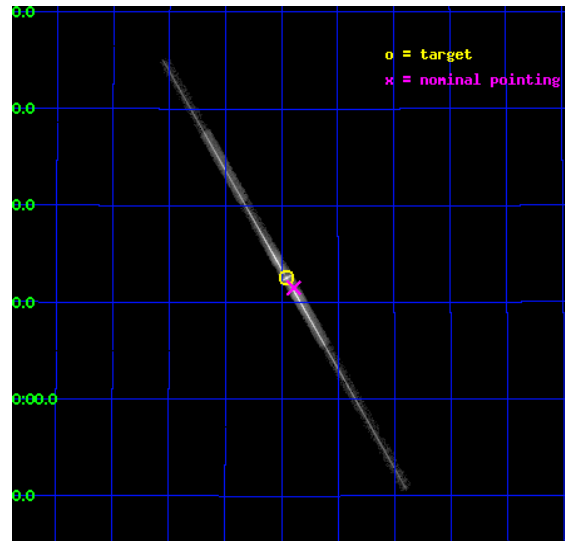
L2 Processing Date : Jun 18 2012

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# 1 Front

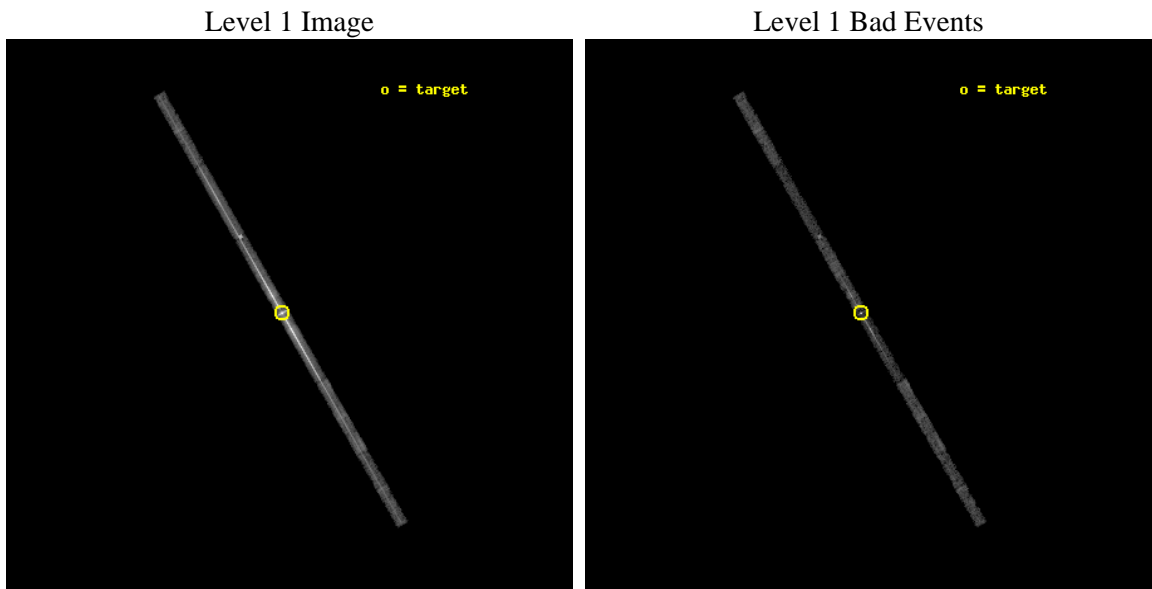
seq_num	702191	Sequence number
obs_id	11605	Observation id
title	A Joint Chandra, Fermi, MAGIC, and VERITAS Broadband Study of One High-Energy Blazar in A Major Outburst	Proposal title
observer	Prof Alexander Konopelko	Principal investigator
object	Mrk 421	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.11375	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.09762005502	Nominal RA [deg]
dec_nom	38.191984019155	Nominal Dec [deg]
roll_nom	60.155853965022	Nominal Roll [deg]
revision	2	Processing version of data
ontime	5243.6999106407	Sum of GTIs [s]
livetime	4953.2952842606	Livetime [s]
ontime4	5243.6999106407	Sum of GTIs [s]
ontime5	5243.6999106407	Sum of GTIs [s]
ontime6	5243.6999106407	Sum of GTIs [s]
ontime7	5243.6999106407	Sum of GTIs [s]
ontime8	5243.6757982373	Sum of GTIs [s]
ontime9	5243.634758234	Sum of GTIs [s]
l2events	224888	Number of level 2 events



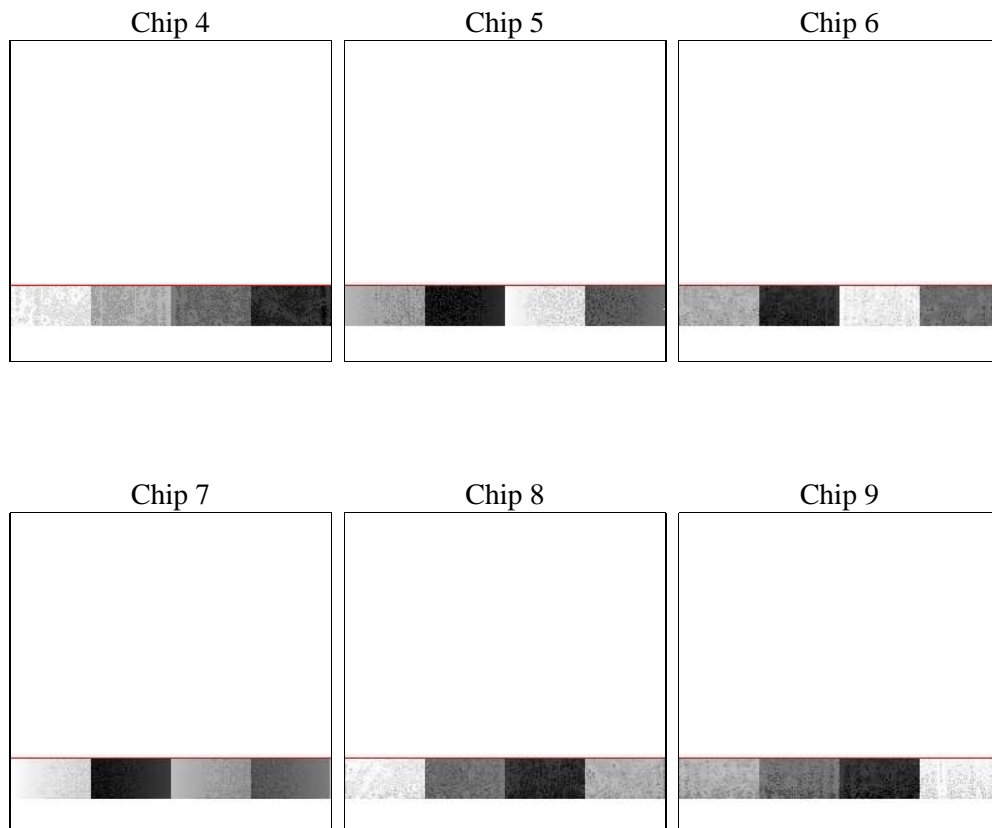
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	5000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	5243.6999106407	Sum of GTIs [s]
caldsver	4.4.10	&#160	ontime4	5243.6999106407	Sum of GTIs [s]
date	2012-06-16T15:39:51	Date and time of file creation	ontime5	5243.6999106407	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	5243.6999106407	Sum of GTIs [s]
			ontime7	5243.6999106407	Sum of GTIs [s]
			ontime8	5243.6757982373	Sum of GTIs [s]
			ontime9	5243.634758234	Sum of GTIs [s]
			l1events	280921	Number of level 1 events

### 2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	10381	25871	86091	132300	17404	8874
rejected events	7341	4589	8332	9927	8389	5861
rejected %	70%	17%	9%	7%	48%	66%

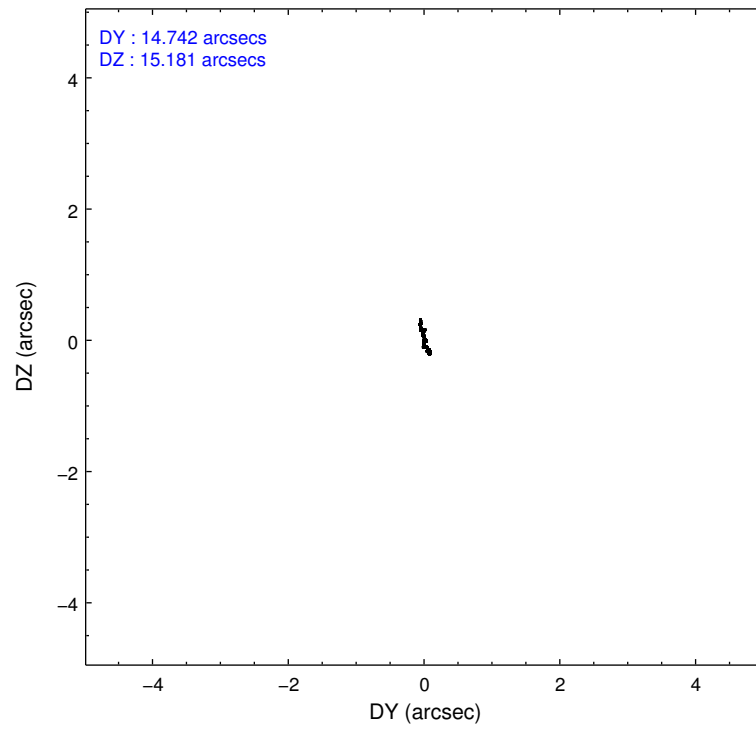
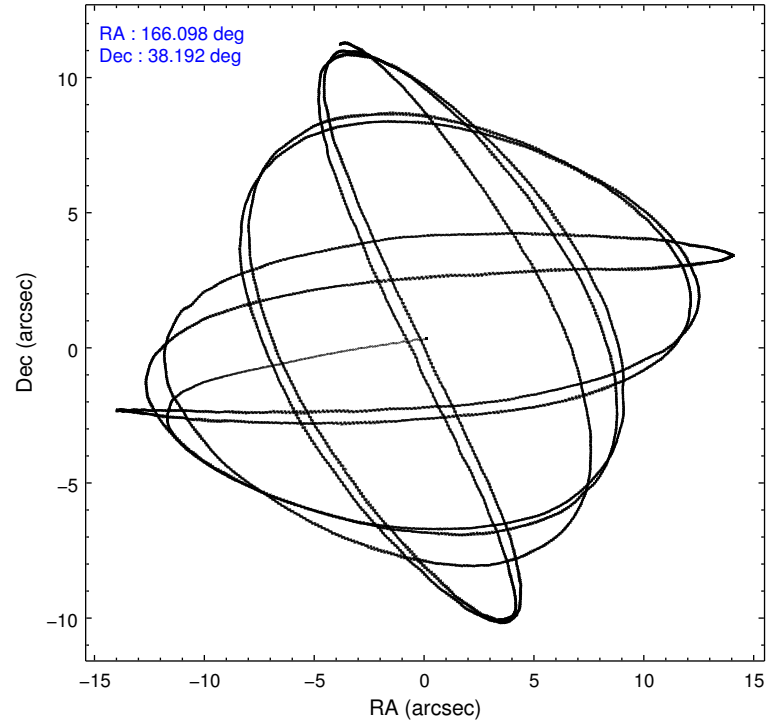
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	2094	10110	61765	32809	5809	2133
	20%	39%	71%	24%	33%	24%
grade 1 events	8	321	624	527	11	6
	0%	1%	0%	0%	0%	0%
grade 2 events	399	3989	8219	31448	1190	350
	3%	15%	9%	23%	6%	3%
grade 3 events	199	2305	2760	14406	510	189
	1%	8%	3%	10%	2%	2%
grade 4 events	171	1799	2800	14230	433	190
	1%	6%	3%	10%	2%	2%
grade 5 events	215	1064	622	3006	335	247
	2%	4%	0%	2%	1%	2%
grade 6 events	178	3089	2238	29533	1074	153
	1%	11%	2%	22%	6%	1%
grade 7 events	7117	3194	7063	6341	8042	5606
	68%	12%	8%	4%	46%	63%

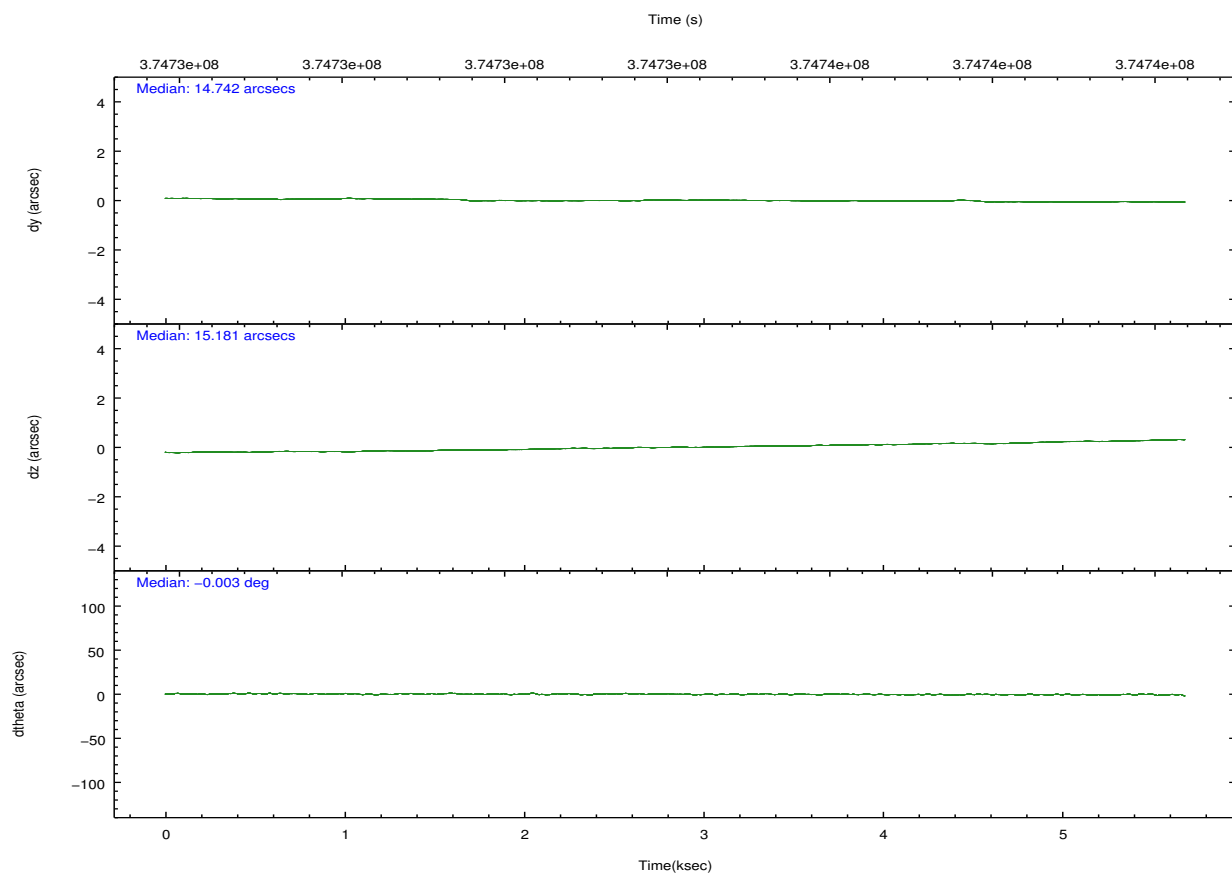
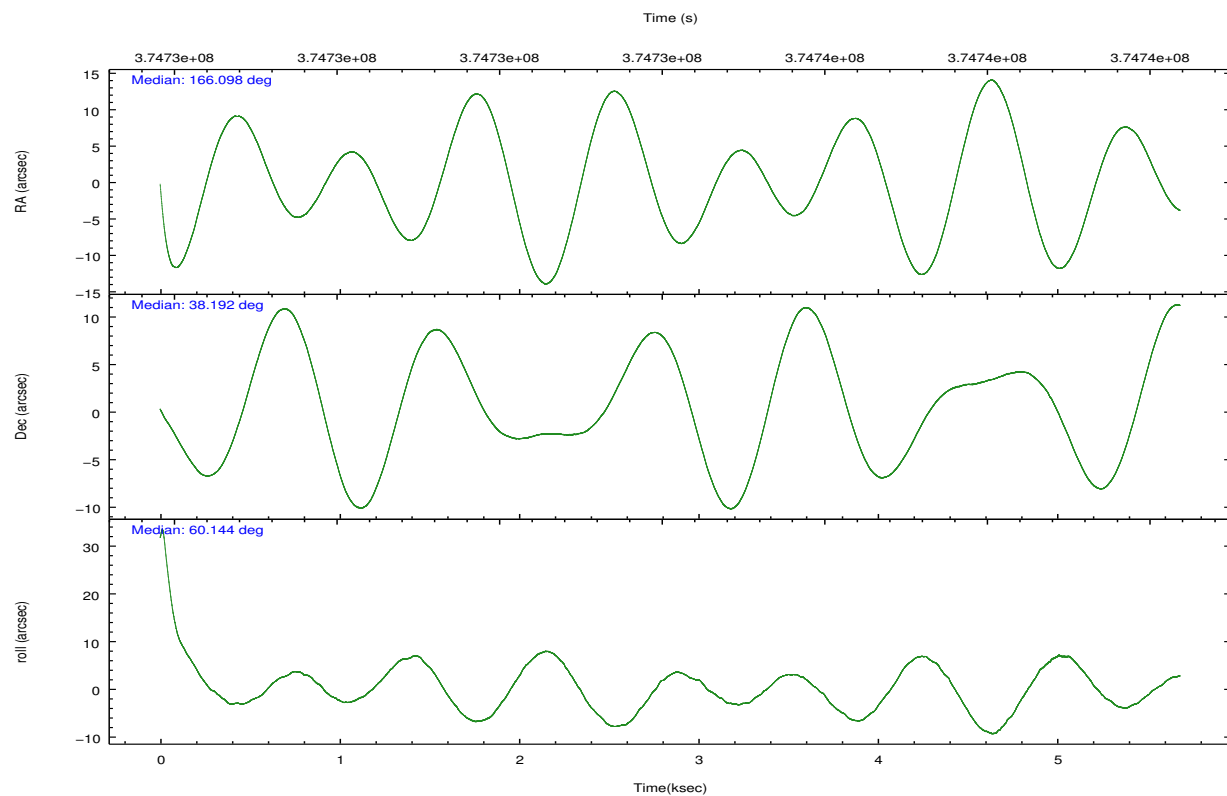


## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-456789	ACIS-456789	Obspar file type	PREDICTED	ACTUAL
Grating	LETG	LETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	166.098217	166.0976200550174	Subarray requested	CUSTOM	1/8
[deg] Pointing Dec	38.164663	38.19198401915497	Subarray start row	113	113
[deg] Pointing Roll	59.998798	60.15585396502239	Subarray row count	128	128
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Alternating exposures requested	N	N
[mm] SIM defocus	0	0.001444936568705701	[s] Primary exposure time	0.000000	0.7
[mm] SIM translation stage pos	-182.132523	-182.1344861297048			
[mm] SIM translation stage offset	-8	-7.998036453302973			
[s] Observation start time (MET)	374731702.184000	374730260.23675			
Observation start date	2009-11-16T04:07:16	2009-11-16T03:44:20			
[s] Observation end time (MET)	374736702.184000	374737929.79964			
Observation end date	2009-11-16T05:30:36	2009-11-16T05:52:09			
Read mode	TIMED	TIMED			

## 2.3 Aspect



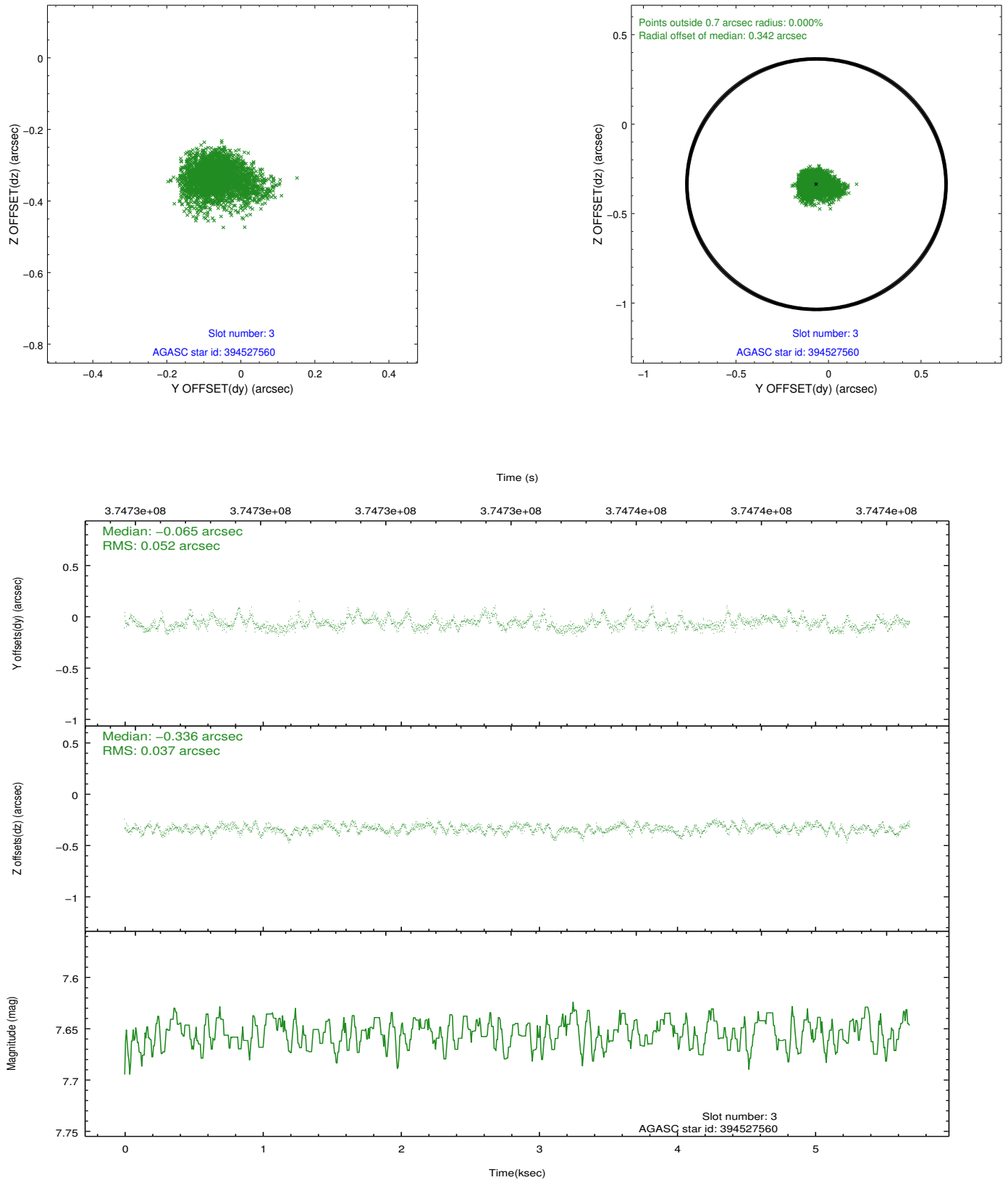


### Slot Statistics

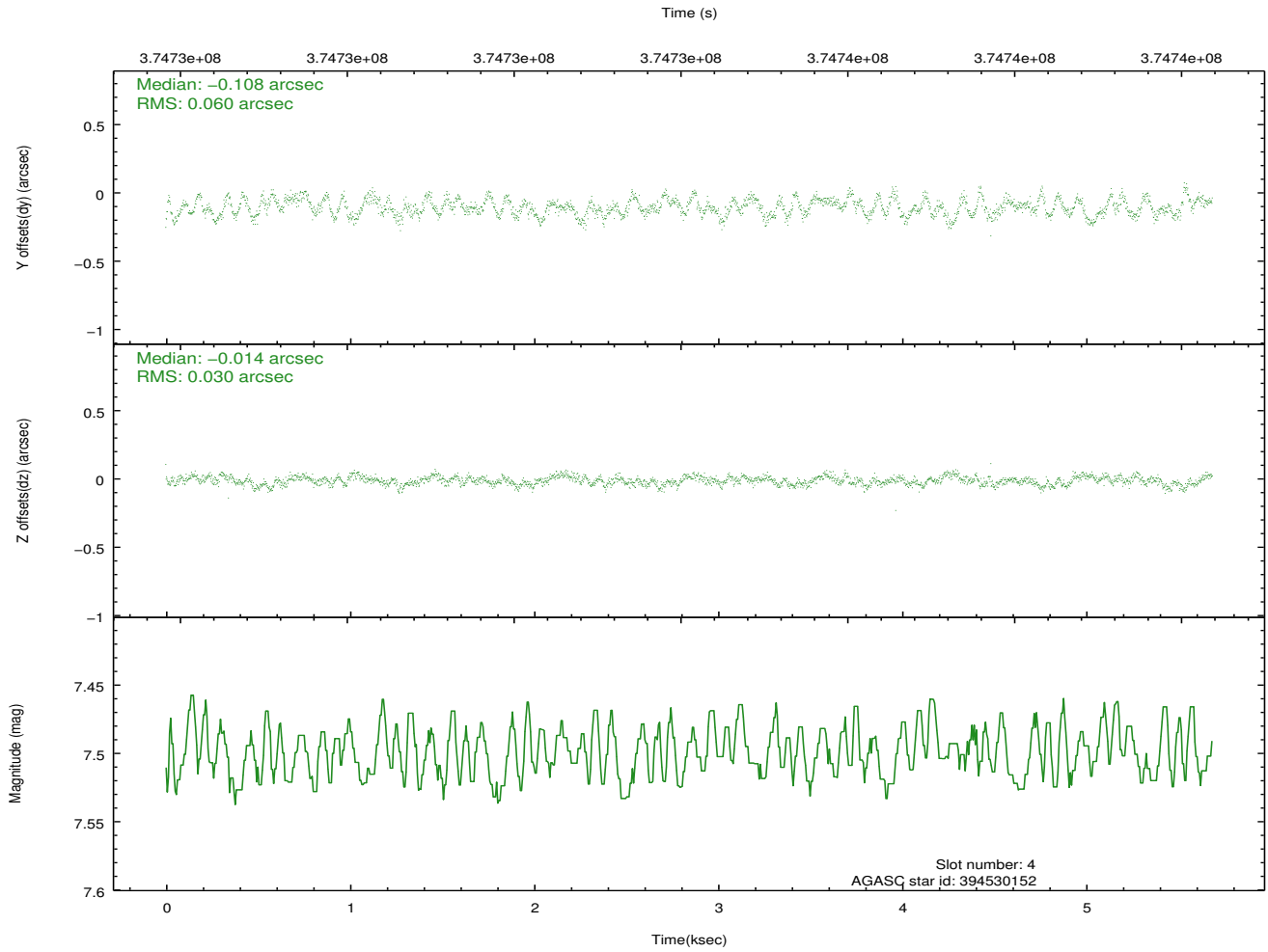
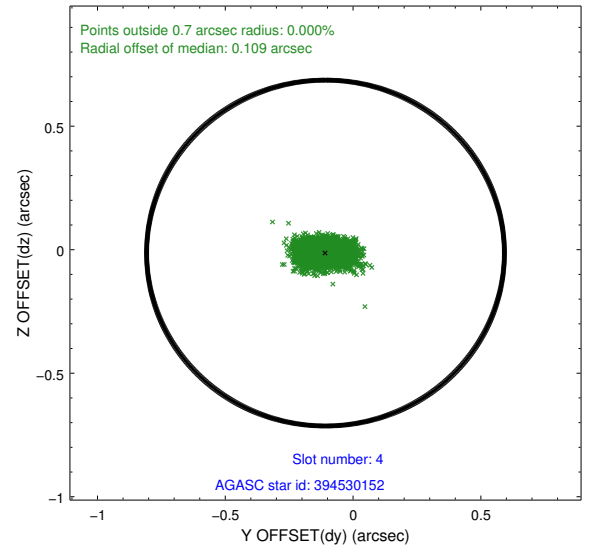
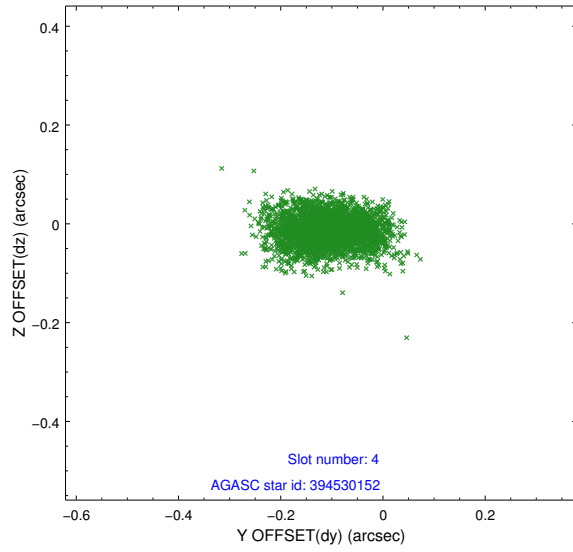
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	6.88	1387	-0.180	-0.129	0.007	0.012	0.000000	0.000000	-767.36	-1901.45
1	FID	ACIS-S-4	6.95	1387	0.160	0.106	0.007	0.011	0.000000	0.000000	2145.82	5.98
2	FID	ACIS-S-6	7.19	1387	-0.008	0.031	0.009	0.016	0.000000	0.000000	396.20	644.53
3	GUIDE	394527560	7.65	2775	-0.065	-0.336	0.067	0.112	165.970713	38.960939	2304.16	1742.57
4	GUIDE	394530152	7.50	2775	-0.108	-0.014	0.071	0.118	166.075805	38.868252	2162.90	1321.80
5	GUIDE	394533848	8.72	2772	0.241	0.021	0.066	0.106	166.382906	38.276007	750.77	-492.13
6	GUIDE	394546720	6.41	2775	-0.178	0.279	0.084	0.144	166.130115	38.241361	284.59	59.89
7	GUIDE	394532424	9.45	2761	0.100	0.047	0.116	0.192	167.196007	38.297687	1980.98	-2437.40

## 2.4 Star Slots

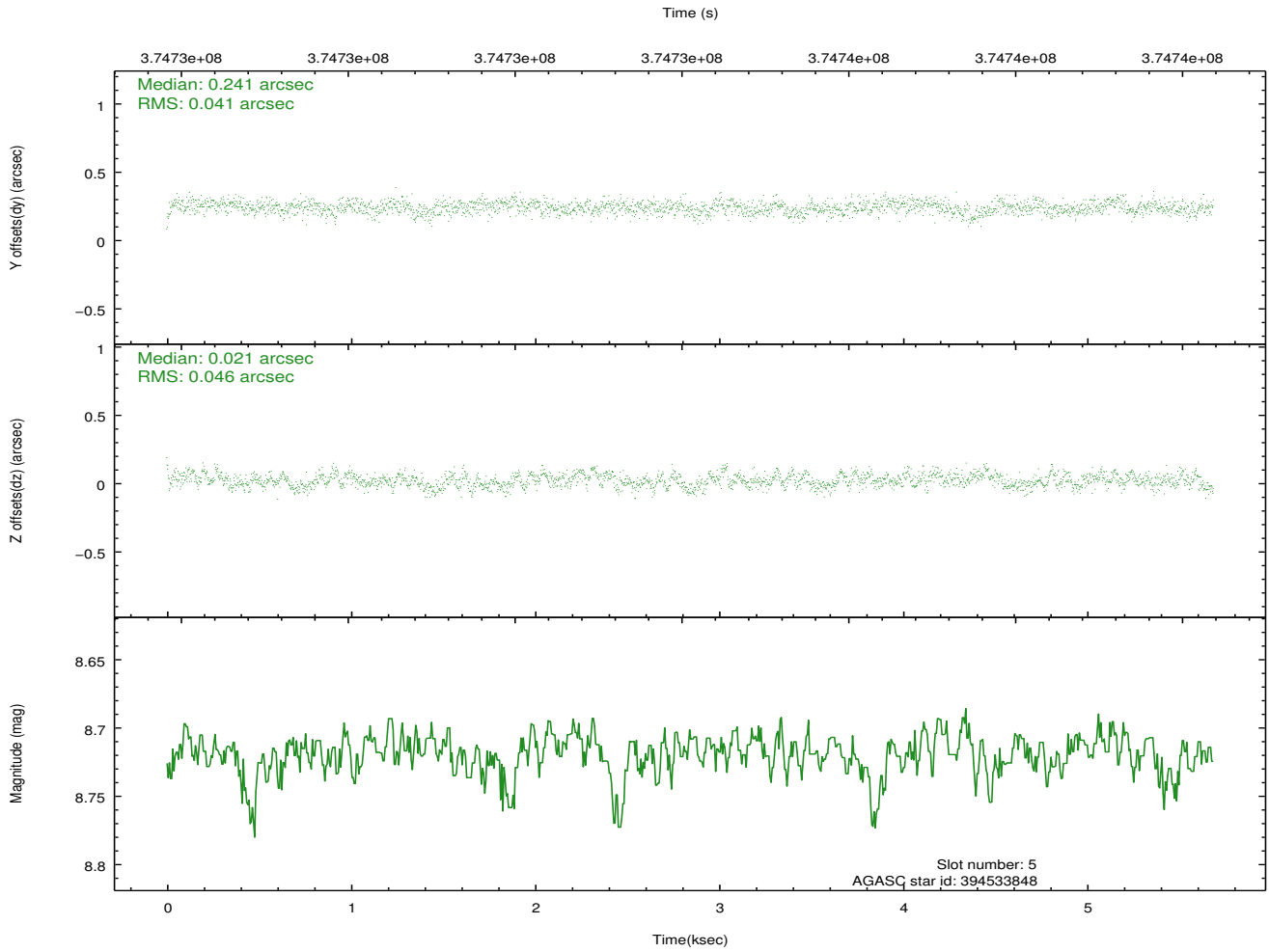
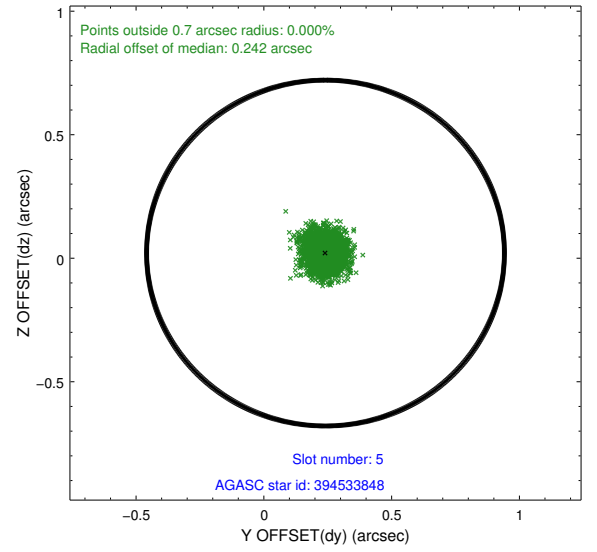
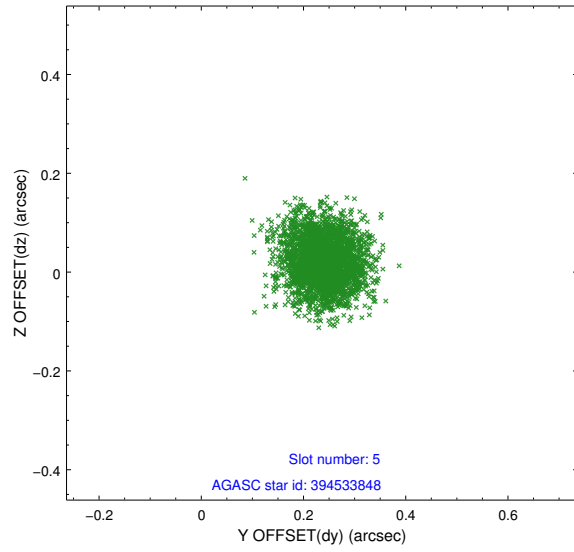
### 2.4.1 Slot 3



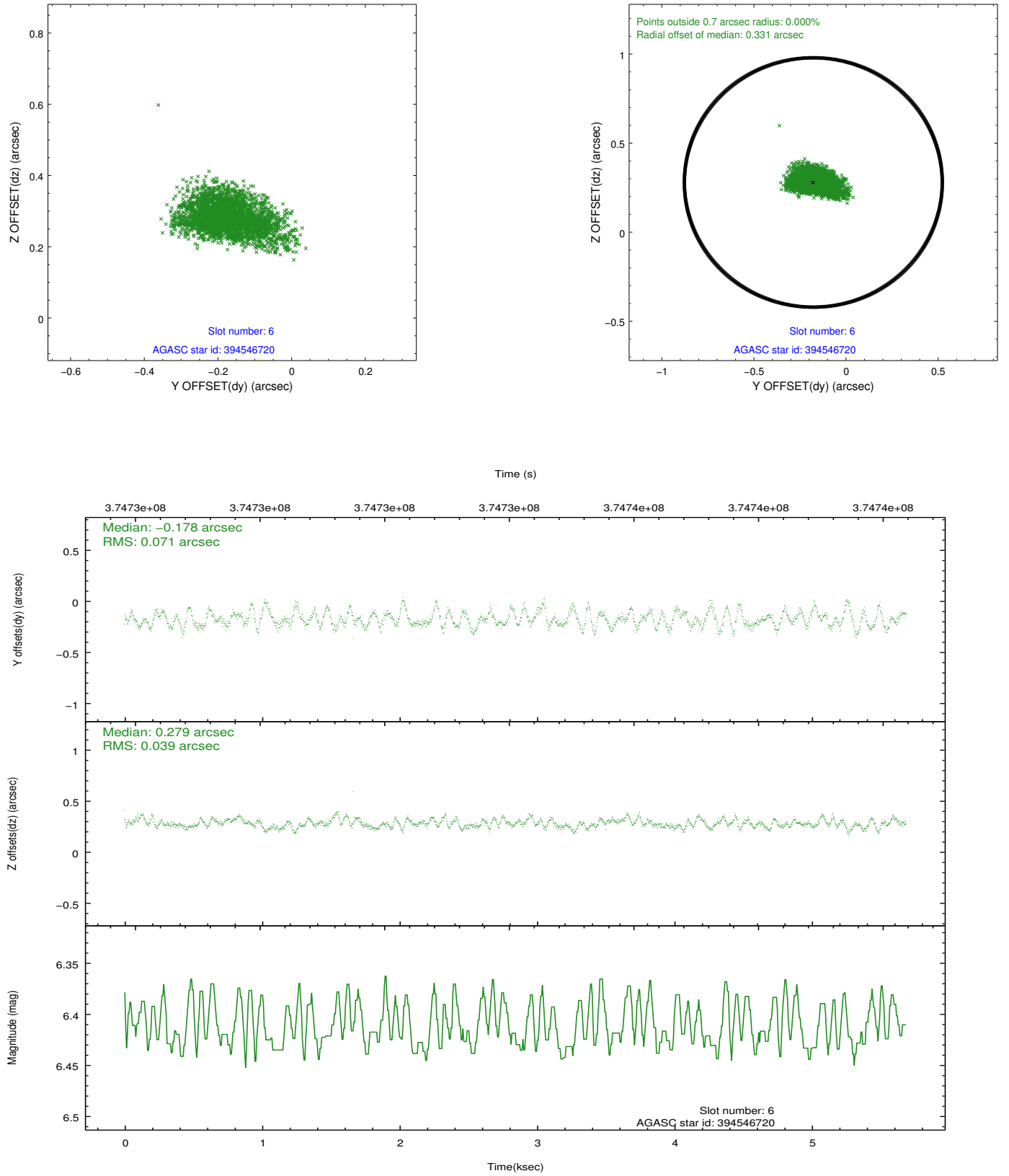
## 2.4.2 Slot 4



### 2.4.3 Slot 5

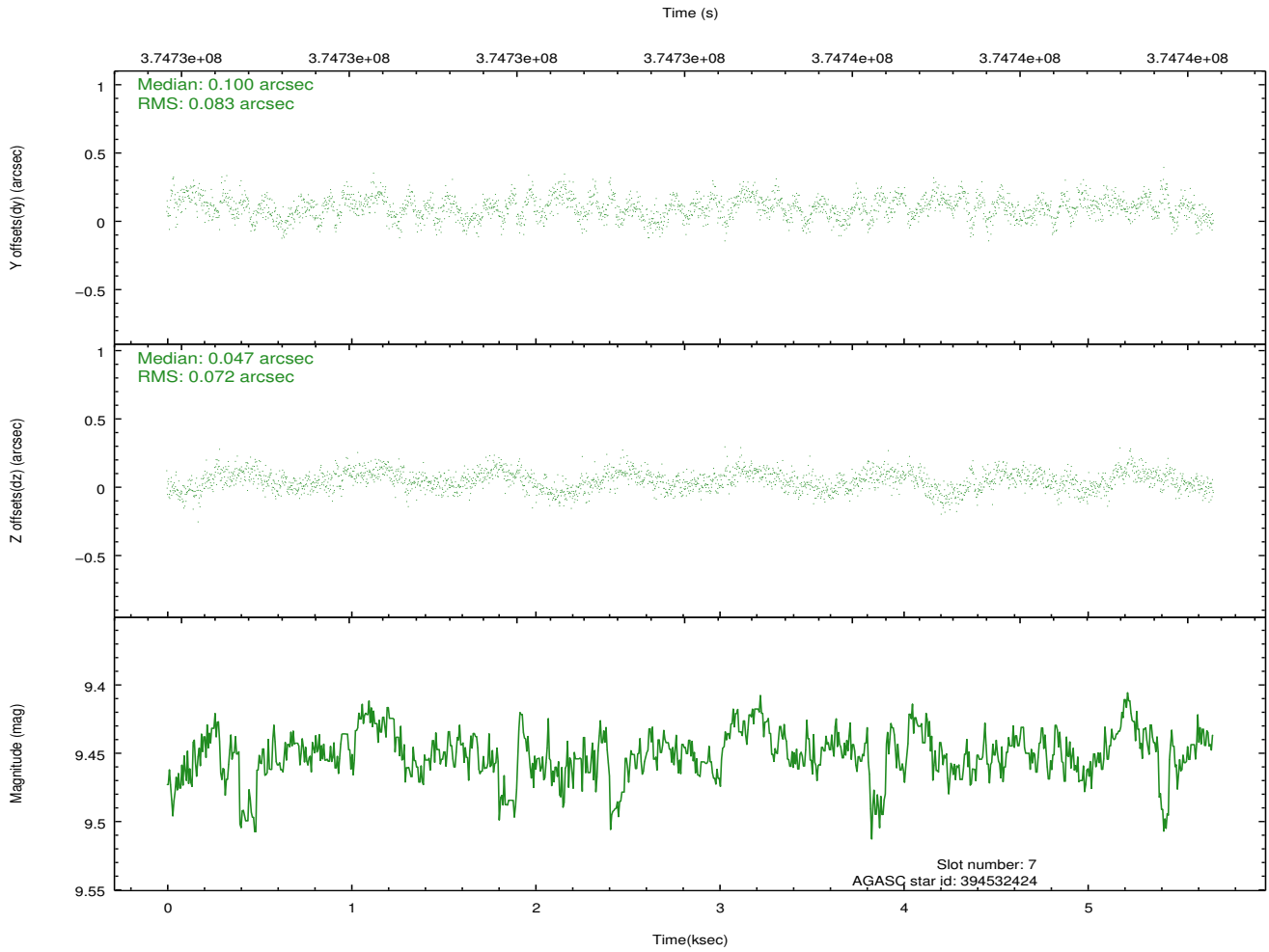
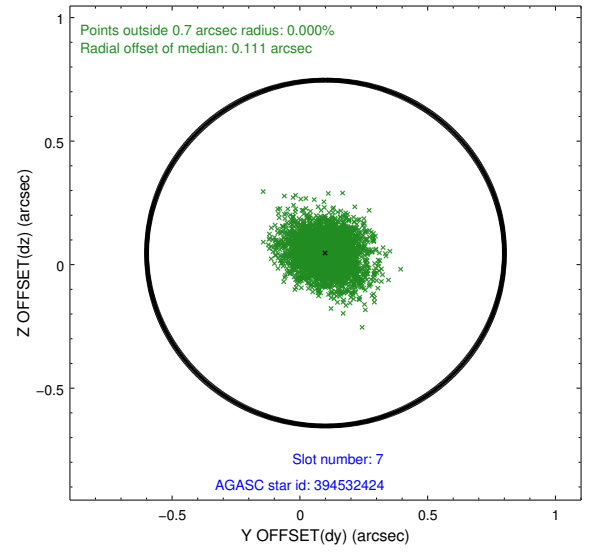
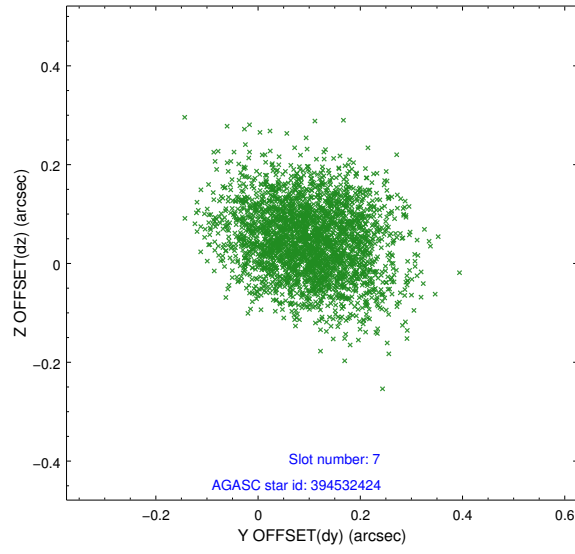


## 2.4.4 Slot 6



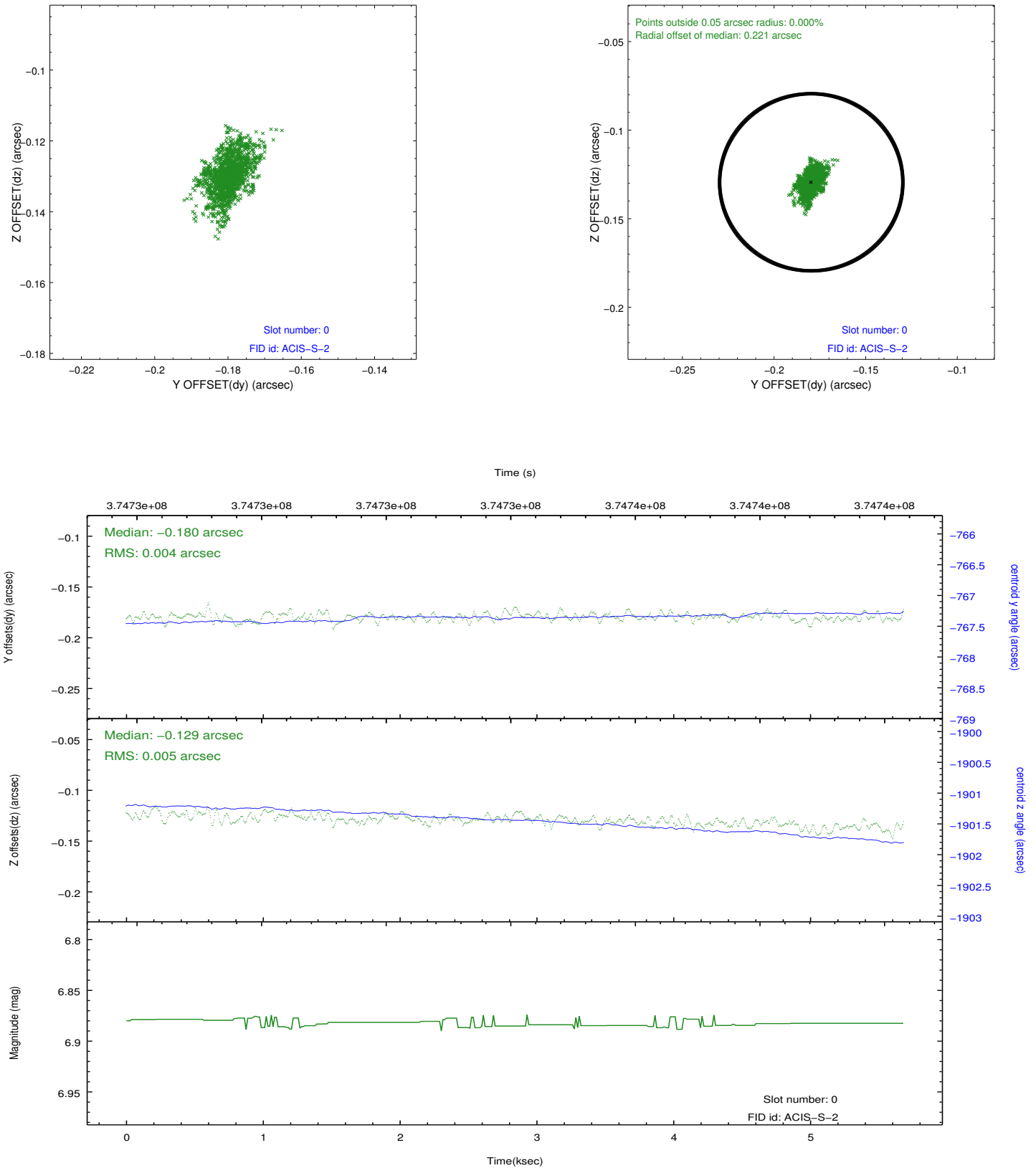


## 2.4.5 Slot 7

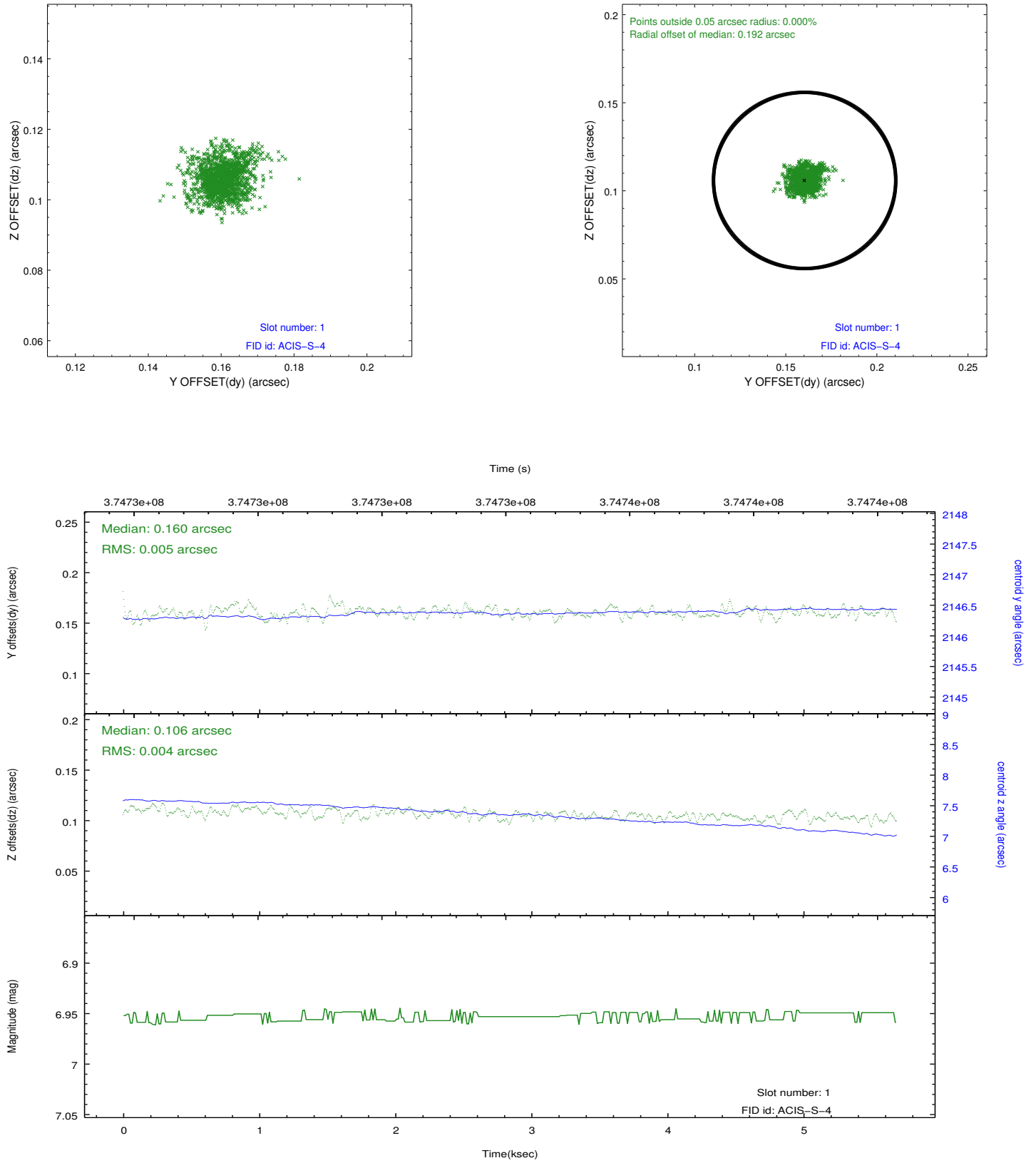


## 2.5 FID Slots

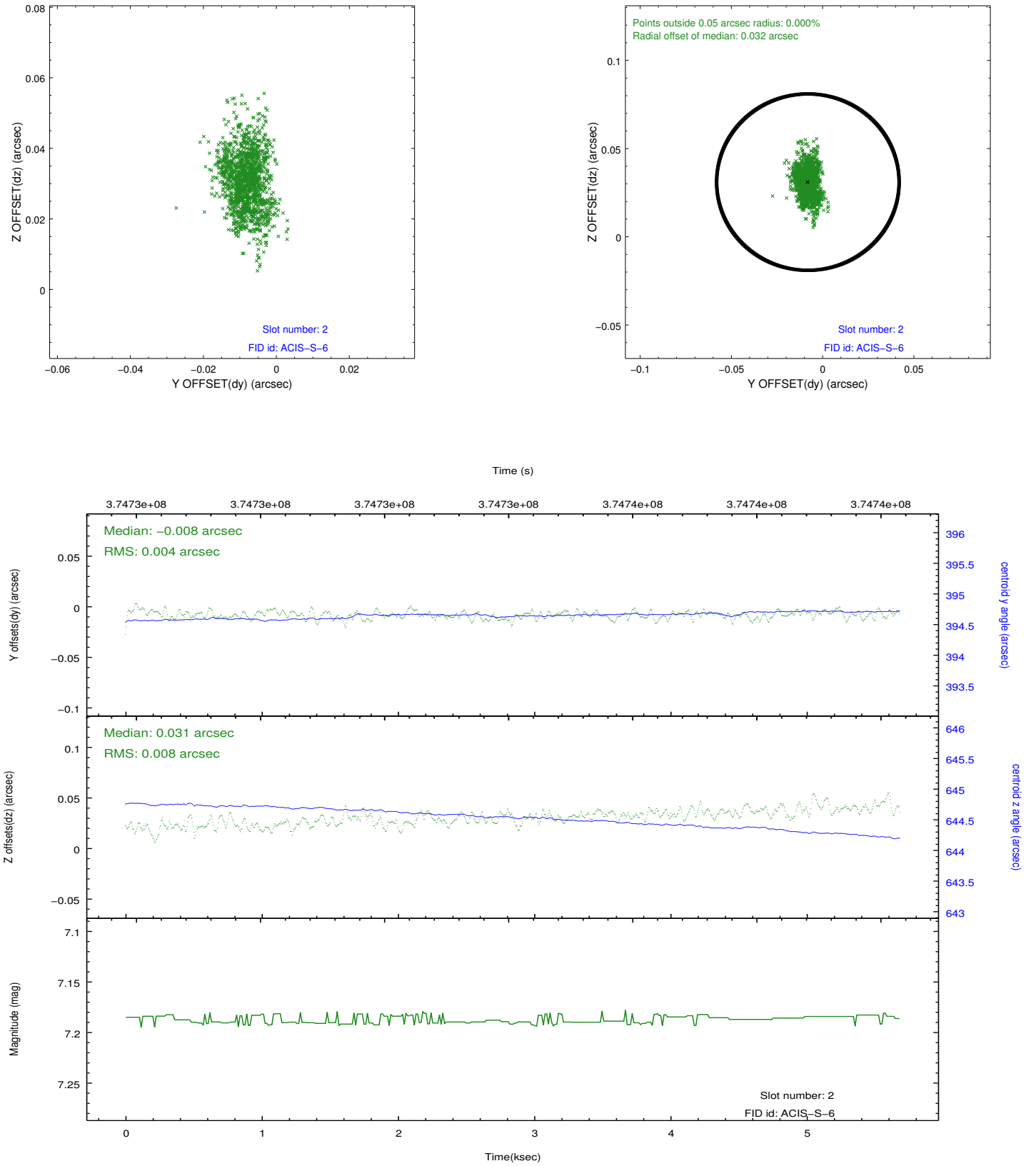
### 2.5.1 Slot 0



## 2.5.2 Slot 1

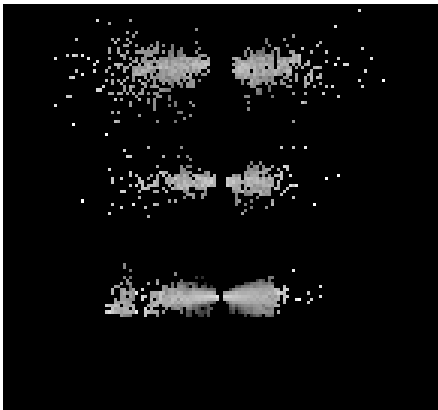


### 2.5.3 Slot 2

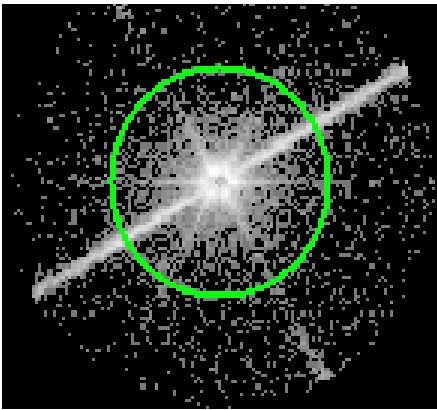


# 3 Gratings

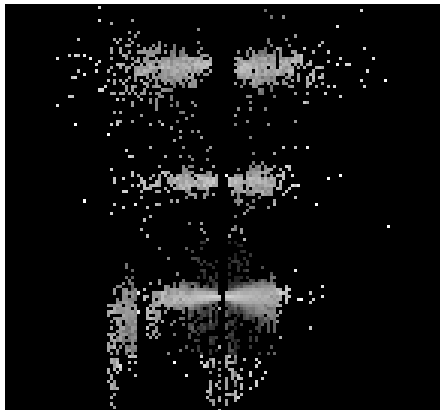
## 3.1 LETG Arm



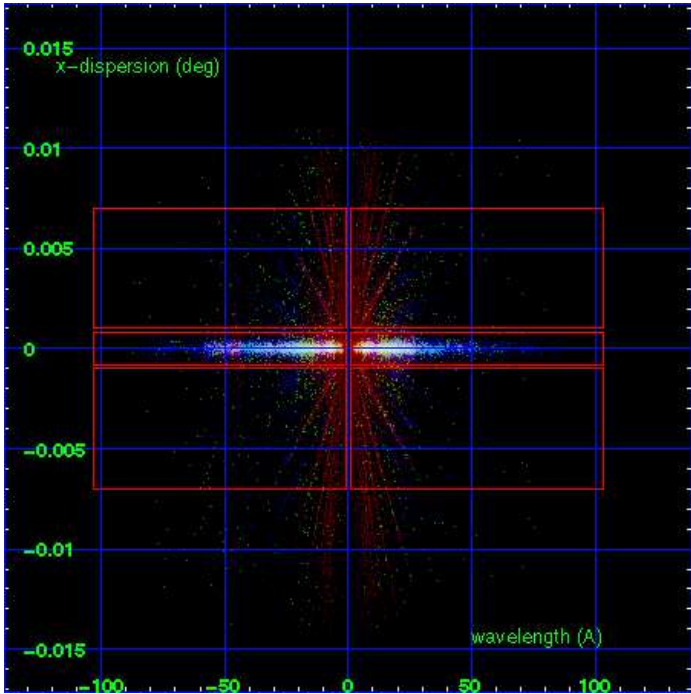
LETG Order Sort 123



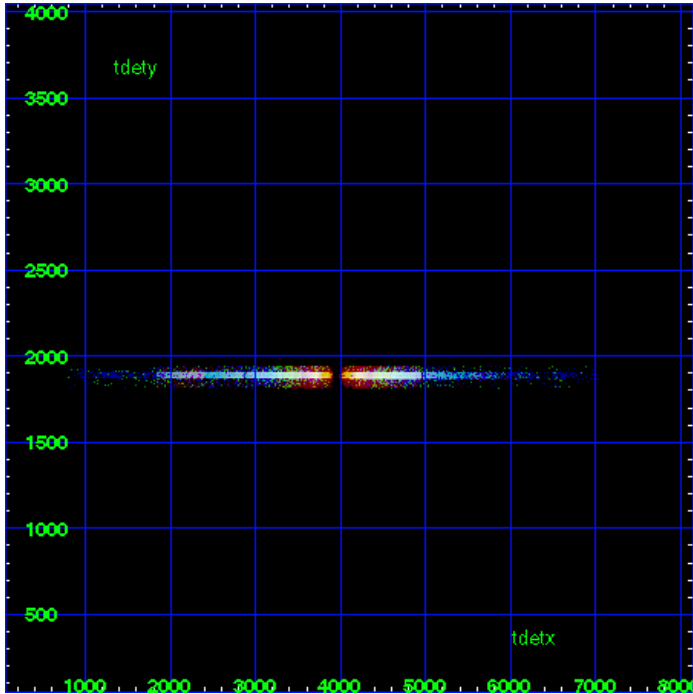
LETG Zero Order



LETG Order Sort ALL

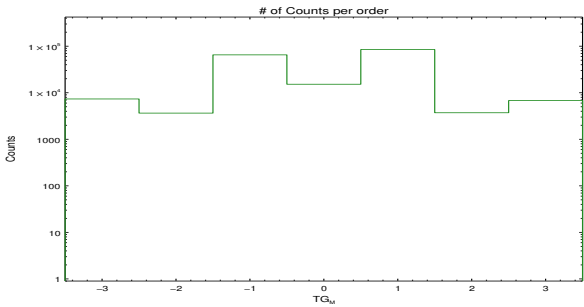


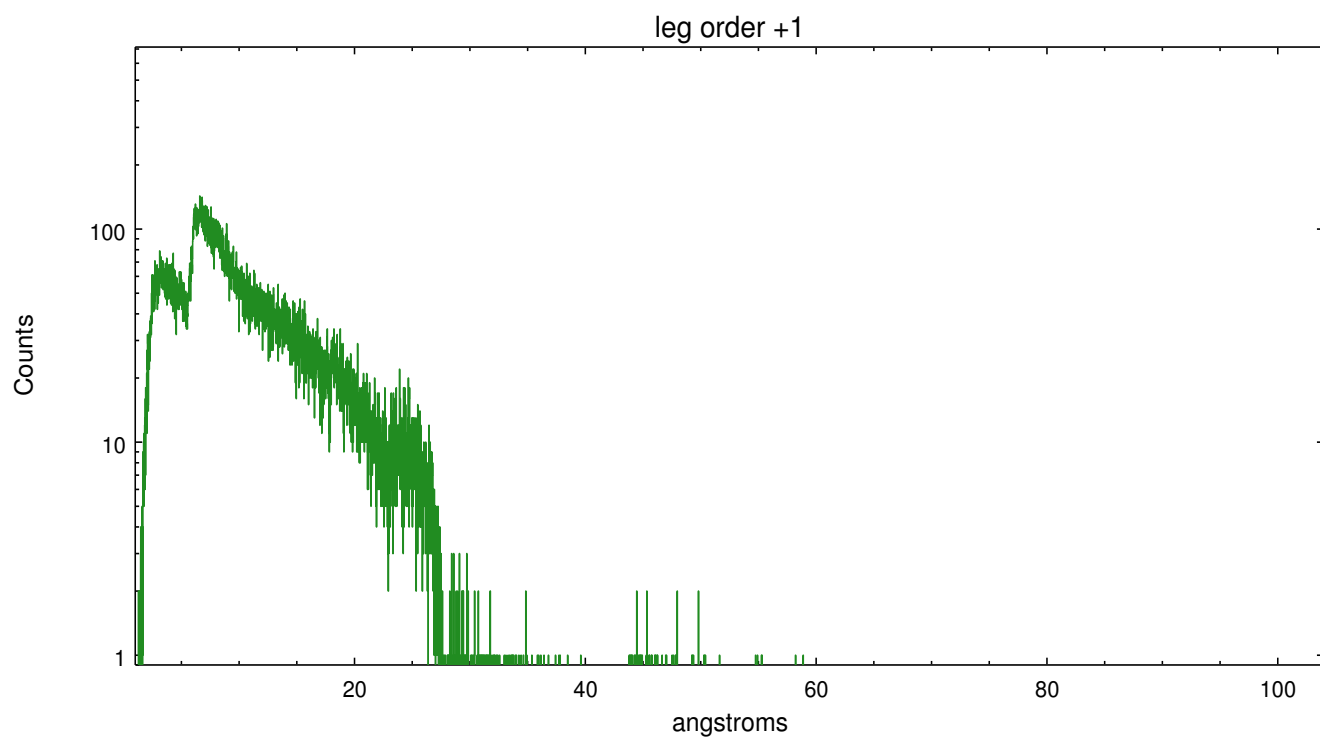
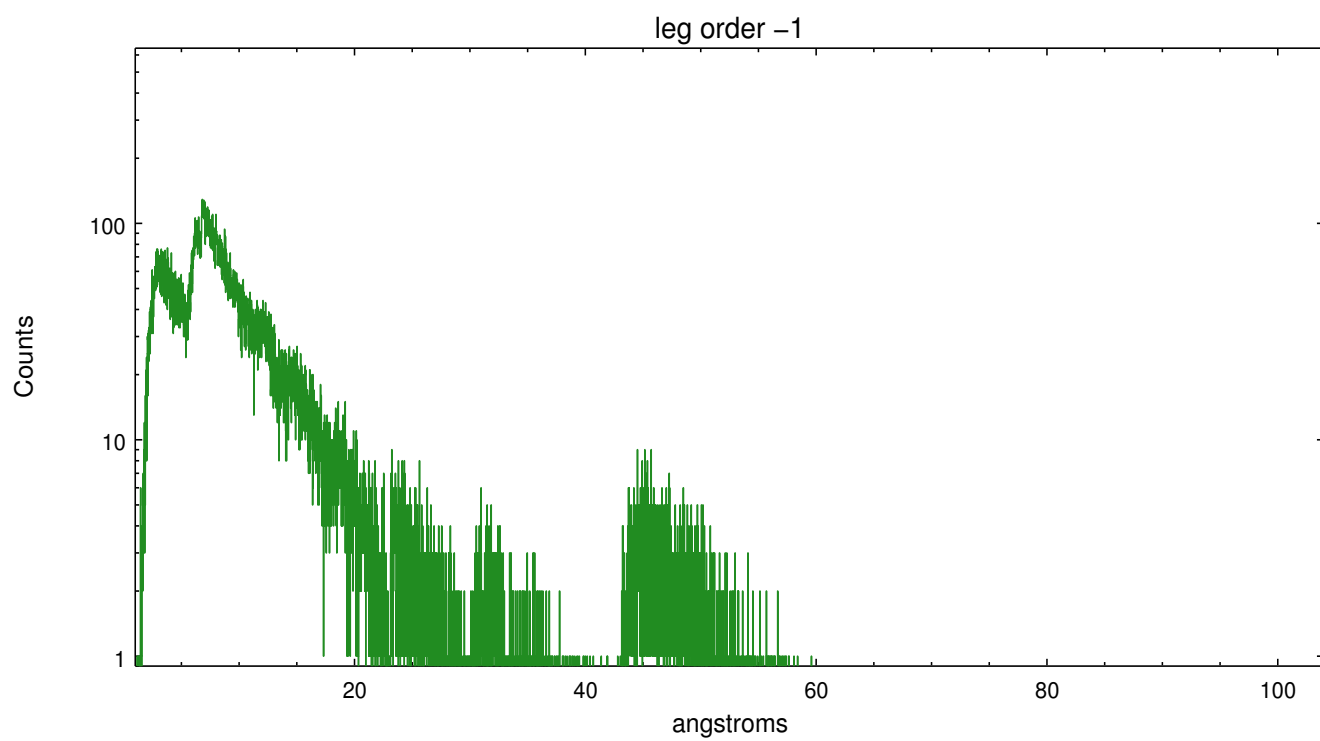
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	7353	3650	65181	15221	84618	3719	6788





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.06.26
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	5.2435989570618

## 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=4003.27, y=4220.05) 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.

===

Gain and CTI correction are not well calibrated on CCD\_ID 5 (ACIS-S1). Default order sorting can clip some regions, particularly longward of 30A (first order). User-specified custom processing parameters may be required in tg\_resolve\_events (osipfile=none, osort\_lo, osort\_hi ~0.5) though this can allow more zeroth order background at short wavelengths.