

# V&V Reference Report

## L2 ASCDS Version : 8.4.4

Observation 9150 - L2 Version 3  
Chandra X-Ray Center

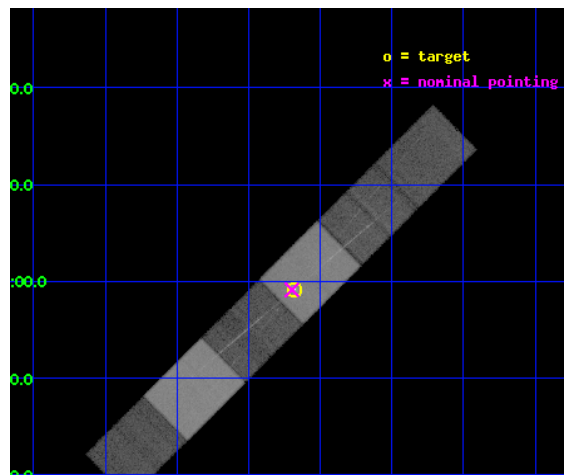
L2 Processing Date : Jun 1 2012

## Contents

<b>1</b>	<b>Front</b>	<b>2</b>
<b>2</b>	<b>OBI</b>	<b>3</b>
2.1	OBI . . . . .	3
2.1.1	Images . . . . .	3
2.1.2	Bias . . . . .	3
2.1.3	Parameters . . . . .	4
2.1.4	Events . . . . .	4
2.2	Compared Parameters . . . . .	5
2.3	Aspect . . . . .	6
2.4	Star Slots . . . . .	9
2.4.1	Slot 3 . . . . .	9
2.4.2	Slot 4 . . . . .	10
2.4.3	Slot 5 . . . . .	11
2.4.4	Slot 6 . . . . .	12
2.4.5	Slot 7 . . . . .	13
2.5	FID Slots . . . . .	14
2.5.1	Slot 0 . . . . .	14
2.5.2	Slot 1 . . . . .	15
2.5.3	Slot 2 . . . . .	16
<b>3</b>	<b>Gratings</b>	<b>17</b>
3.1	HEG Arm . . . . .	17
3.2	MEG Arm . . . . .	19
<b>A</b>	<b>Summary</b>	<b>21</b>
A.1	Status . . . . .	21
A.2	Comments . . . . .	21

# 1 Front

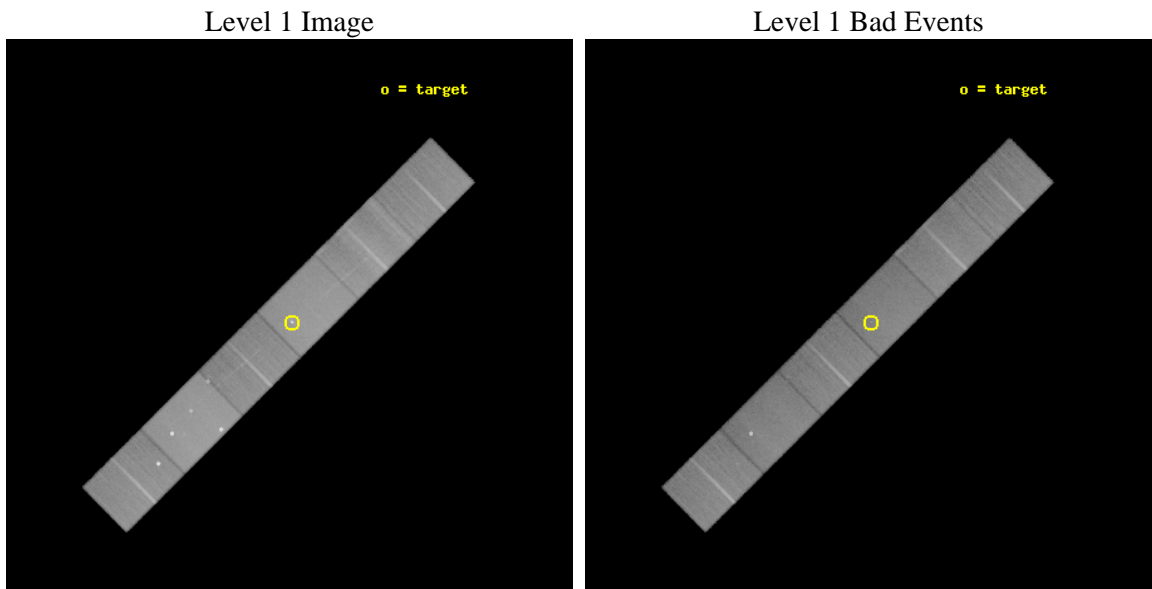
seq_num	701592	Sequence number
obs_id	9150	Observation id
title	NGC 1068: Photo-ionized gas in the nucleus, and ionization cone	Pr
observer	Prof Claude Canizares	Principal investigator
object	NGC 1068	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	40.669583	Observer's specified target RA [deg]
dec_targ	-0.013333	Observer's specified target Dec [deg]
ra_nom	40.674306916421	Nominal RA [deg]
dec_nom	-0.01443868262087	Nominal Dec [deg]
roll_nom	315.15661703054	Nominal Roll [deg]
revision	3	Processing version of data
ontime	41757.5	Sum of GTIs [s]
livetime	41083.080156156	Livetime [s]
ontime4	41757.5	Sum of GTIs [s]
ontime5	41757.5	Sum of GTIs [s]
ontime6	41757.5	Sum of GTIs [s]
ontime7	41757.5	Sum of GTIs [s]
ontime8	41754.958979785	Sum of GTIs [s]
ontime9	41754.958979785	Sum of GTIs [s]
l2events	555157	Number of level 2 events



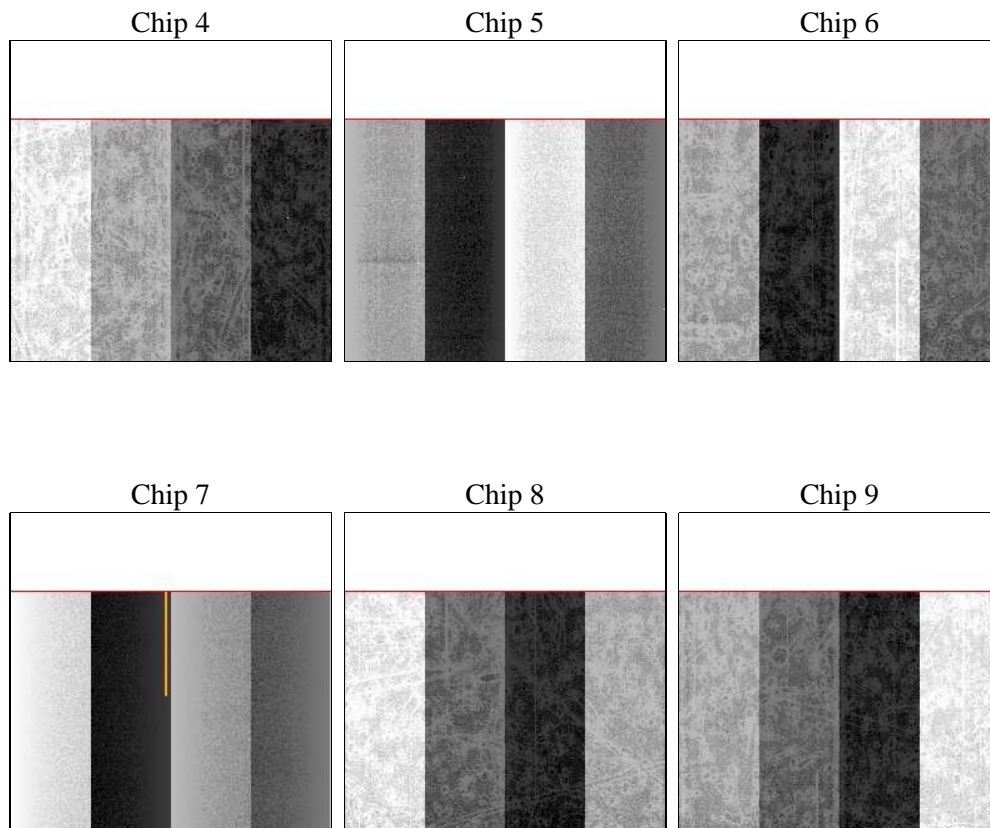
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	42000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.4	Processing system revision	ontime	41757.5	Sum of GTIs [s]
caldbver	4.4.9	&#160	ontime4	41757.5	Sum of GTIs [s]
date	2012-05-24T17:38:34	Date and time of file creation	ontime5	41757.5	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	41757.5	Sum of GTIs [s]
			ontime7	41757.5	Sum of GTIs [s]
			ontime8	41754.958979785	Sum of GTIs [s]
			ontime9	41754.958979785	Sum of GTIs [s]
			l1events	2367252	Number of level 1 events

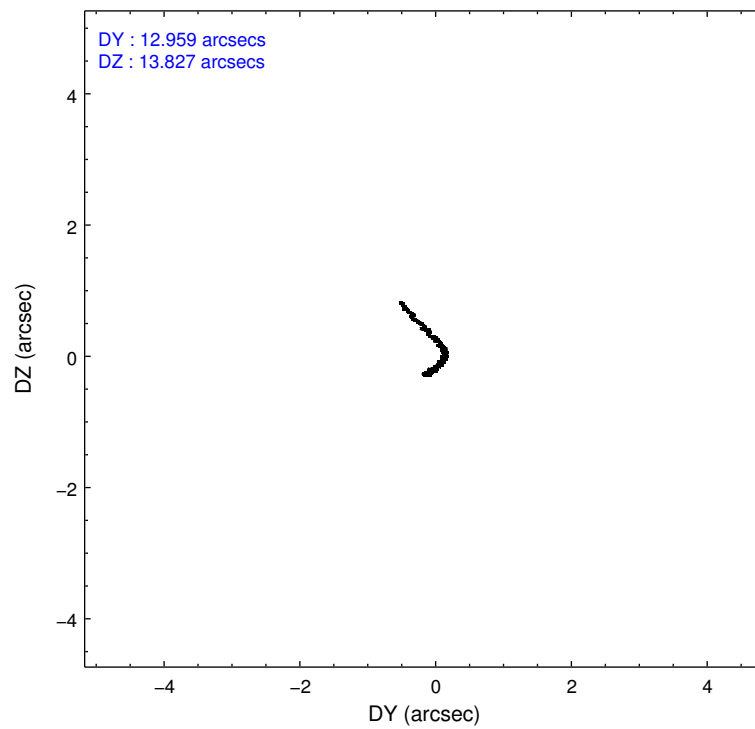
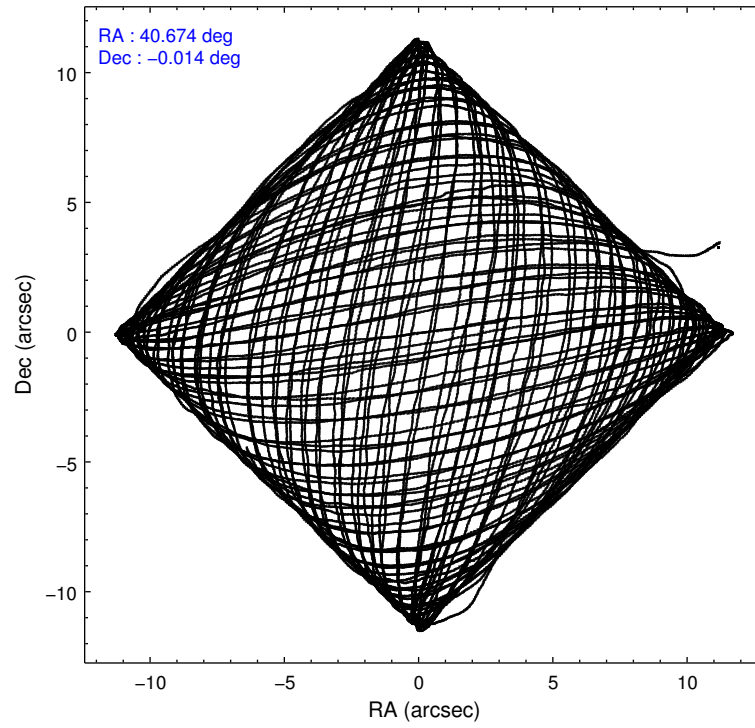
### 2.1.4 Events

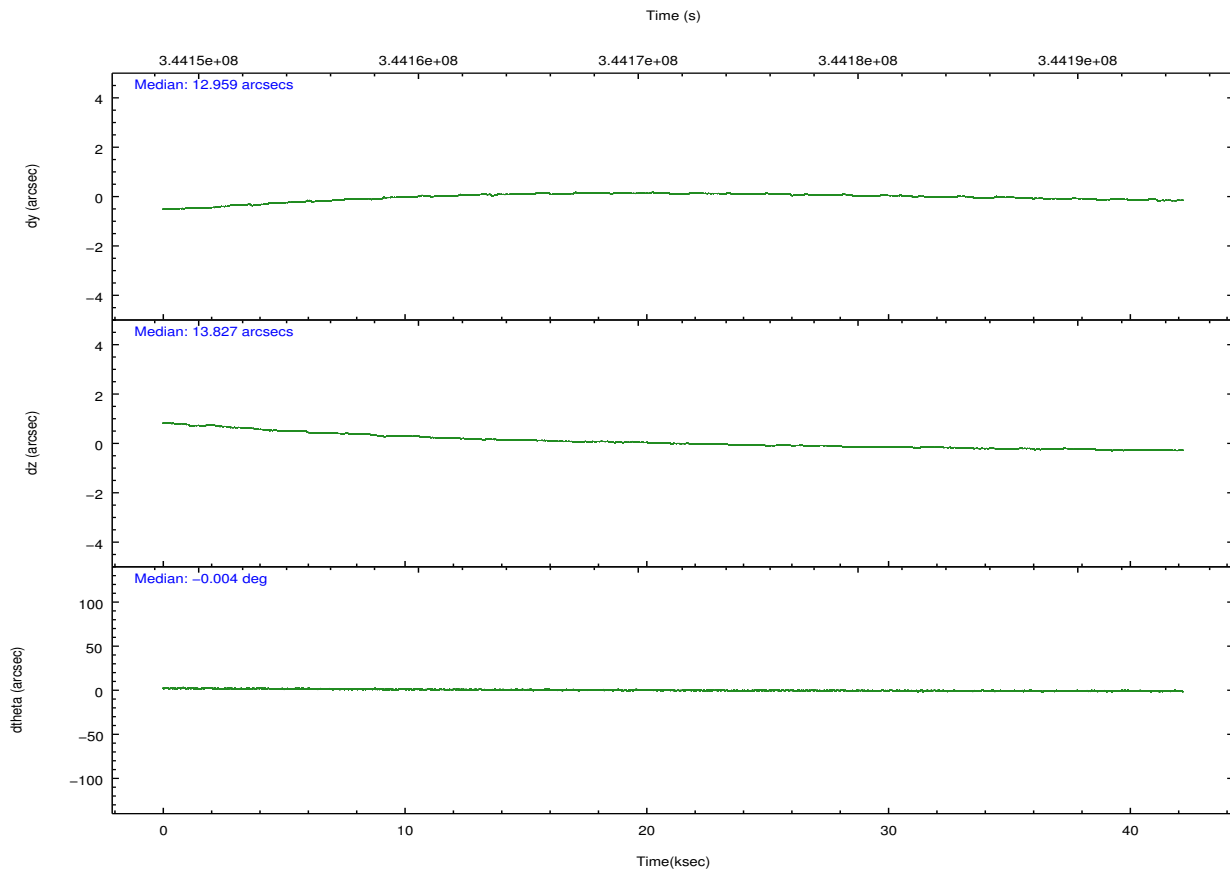
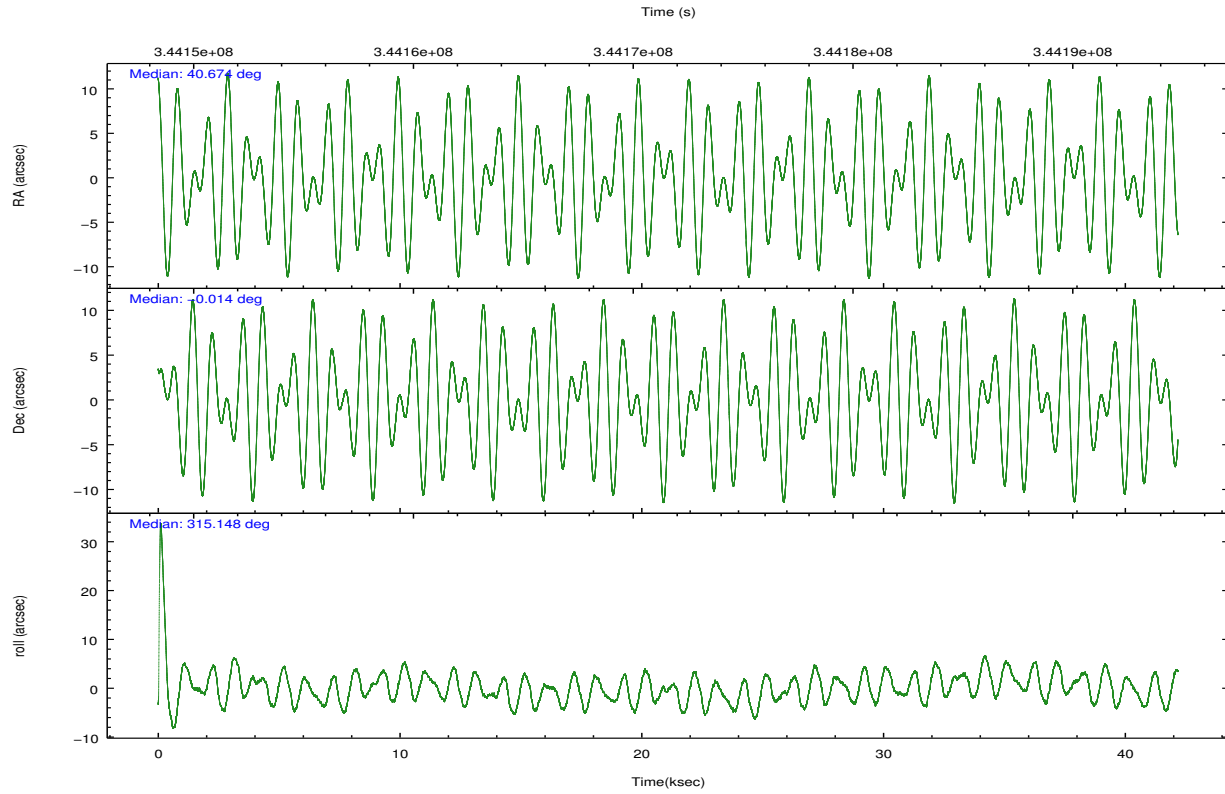
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	362410	511662	317559	449300	407740	318581	grade 0 events	31004	33549	17968	19252	32004	16891
rejected events	307509	268461	274802	254134	309648	277554		8%	6%	5%	4%	7%	5%
rejected %	84%	52%	86%	56%	75%	87%	grade 1 events	310	1300	136	486	296	152
								0%	0%	0%	0%	0%	0%
							grade 2 events	8962	72148	8931	40892	21523	8087
								2%	14%	2%	9%	5%	2%
							grade 3 events	4173	9900	3975	17299	10224	4110
								1%	1%	1%	3%	2%	1%
							grade 4 events	3974	9328	3920	17230	9506	3943
								1%	1%	1%	3%	2%	1%
							grade 5 events	14494	39285	14830	41190	20135	16033
								3%	7%	4%	9%	4%	5%
							grade 6 events	6796	118320	7974	100514	24841	7998
								1%	23%	2%	22%	6%	2%
							grade 7 events	292697	227832	259825	212437	289211	261367
								80%	44%	81%	47%	70%	82%

## 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	HETG	HETG	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	40.647777	40.67430691642053	Subarray requested	CUSTOM	CUSTOM
[deg] Pointing Dec	-0.007798	-0.01443868262087047	Subarray start row	1	1
[deg] Pointing Roll	314.999999	315.156617030536	Subarray row count	774	774
[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	2.5
[mm] SIM translation stage pos	-187.132523	-187.1228876879999			
[mm] SIM translation stage offset	-3	-3.009634895007935			
[s] Observation start time (MET)	344150671.184000	344149000.87407			
Observation start date	2008-11-27T05:23:26	2008-11-27T04:56:40			
[s] Observation end time (MET)	344192671.184000	344193542.25127			
Observation end date	2008-11-27T17:03:26	2008-11-27T17:19:02			
Read mode	TIMED	TIMED			

## 2.3 Aspect



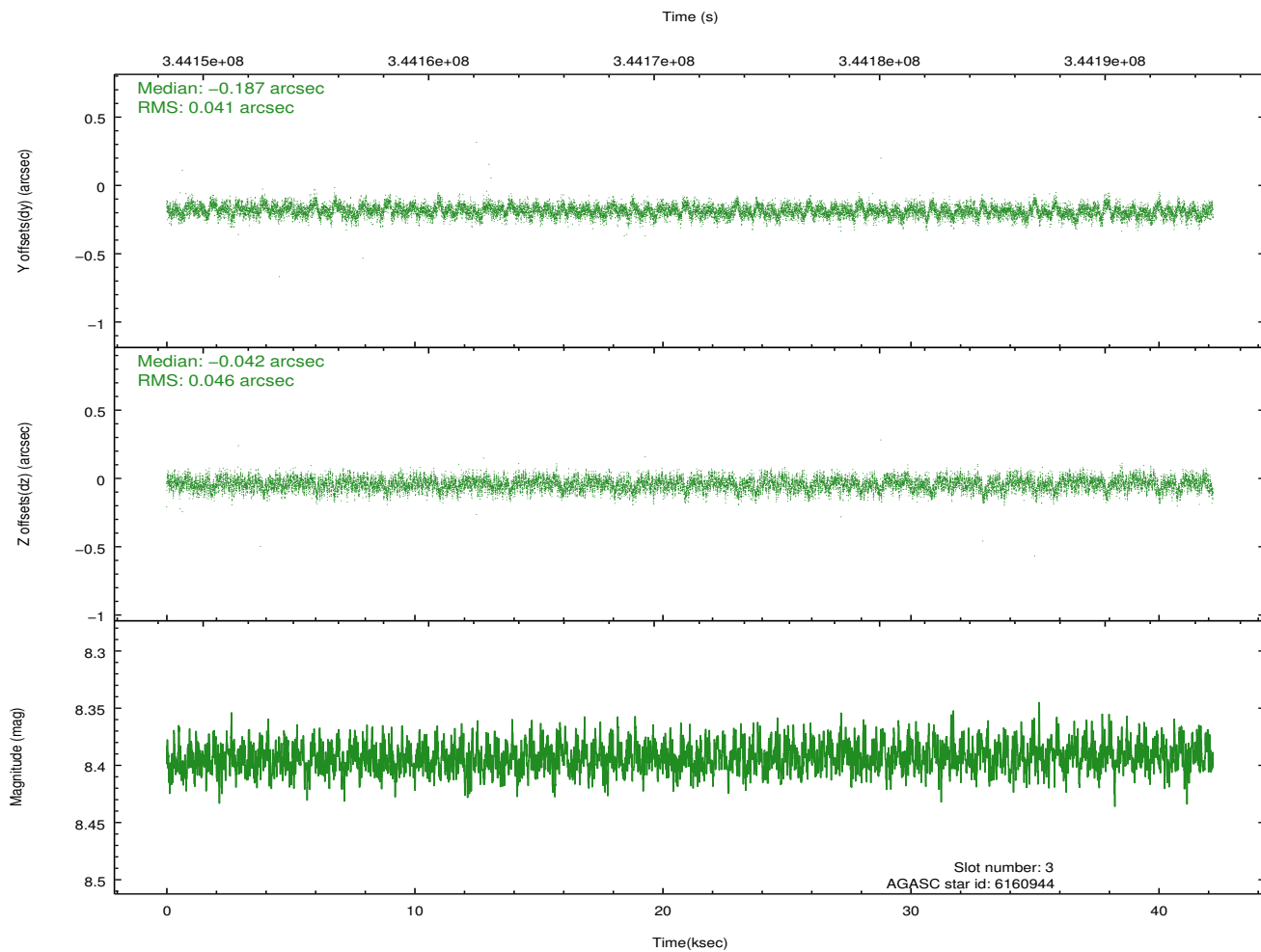
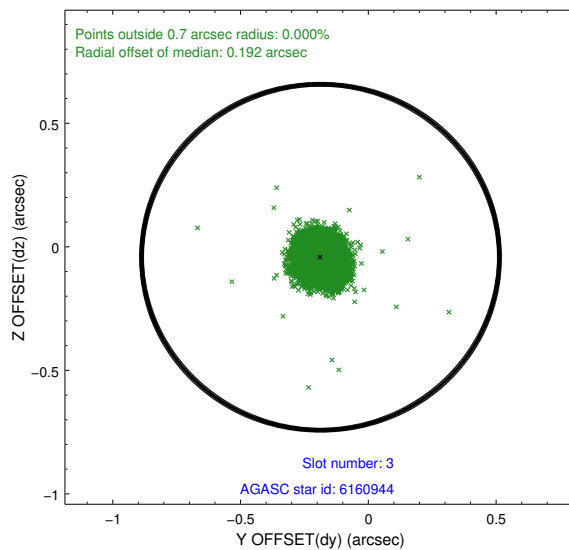
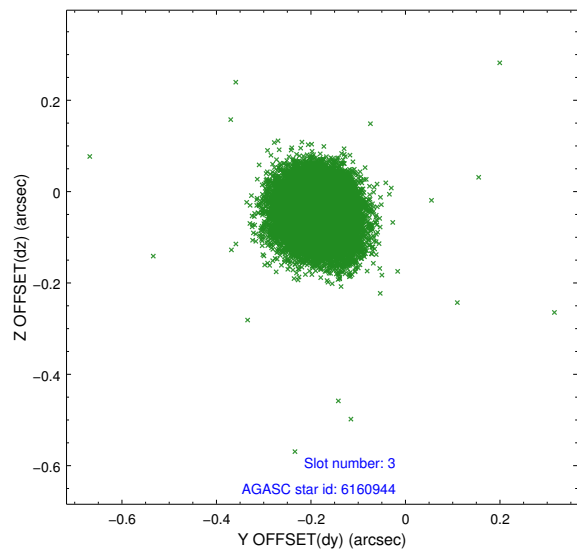


### Slot Statistics

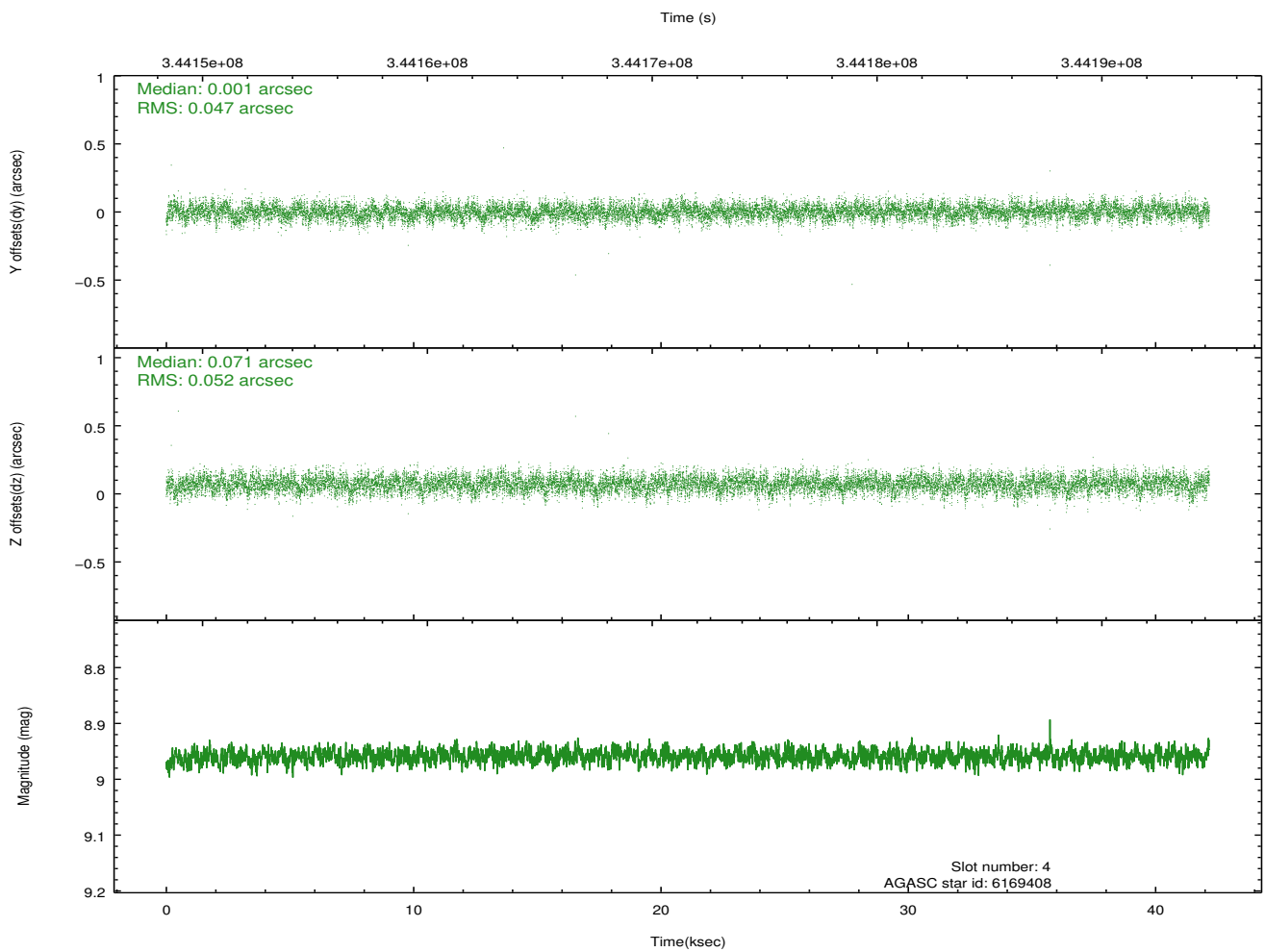
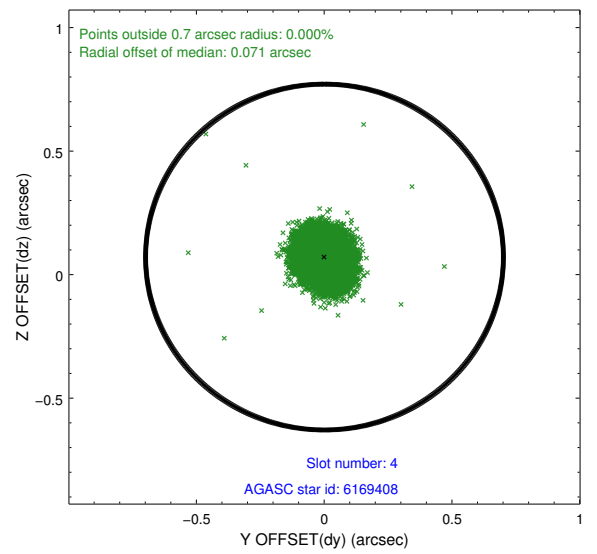
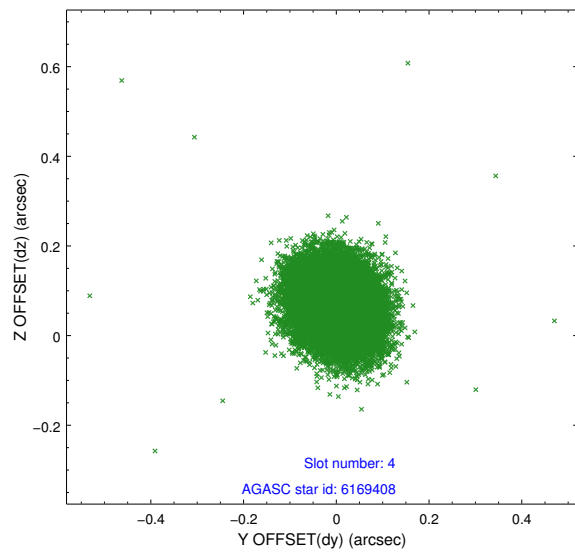
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	6.89	10285	-0.086	-0.053	0.011	0.018	0.000000	0.000000	-765.71	-1797.45
1	FID	ACIS-S-4	6.96	10288	0.180	0.056	0.011	0.021	0.000000	0.000000	2147.83	111.12
2	FID	ACIS-S-5	7.00	10288	-0.125	0.005	0.013	0.020	0.000000	0.000000	-1818.59	104.76
3	GUIDE	6160944	8.39	20567	-0.187	-0.042	0.065	0.104	40.821496	0.087247	200.40	684.10
4	GUIDE	6169408	8.96	20554	0.001	0.071	0.074	0.120	40.937839	0.210390	183.03	1293.56
5	GUIDE	615907528	7.77	20567	-0.039	-0.053	0.068	0.108	41.252710	-0.191636	2008.00	1072.16
6	GUIDE	615909768	9.08	20560	0.134	0.054	0.084	0.137	40.904100	-0.344520	1510.17	-204.79
7	GUIDE	615913552	8.70	20563	0.091	-0.029	0.061	0.098	41.235237	-0.003650	1485.25	1506.06

## 2.4 Star Slots

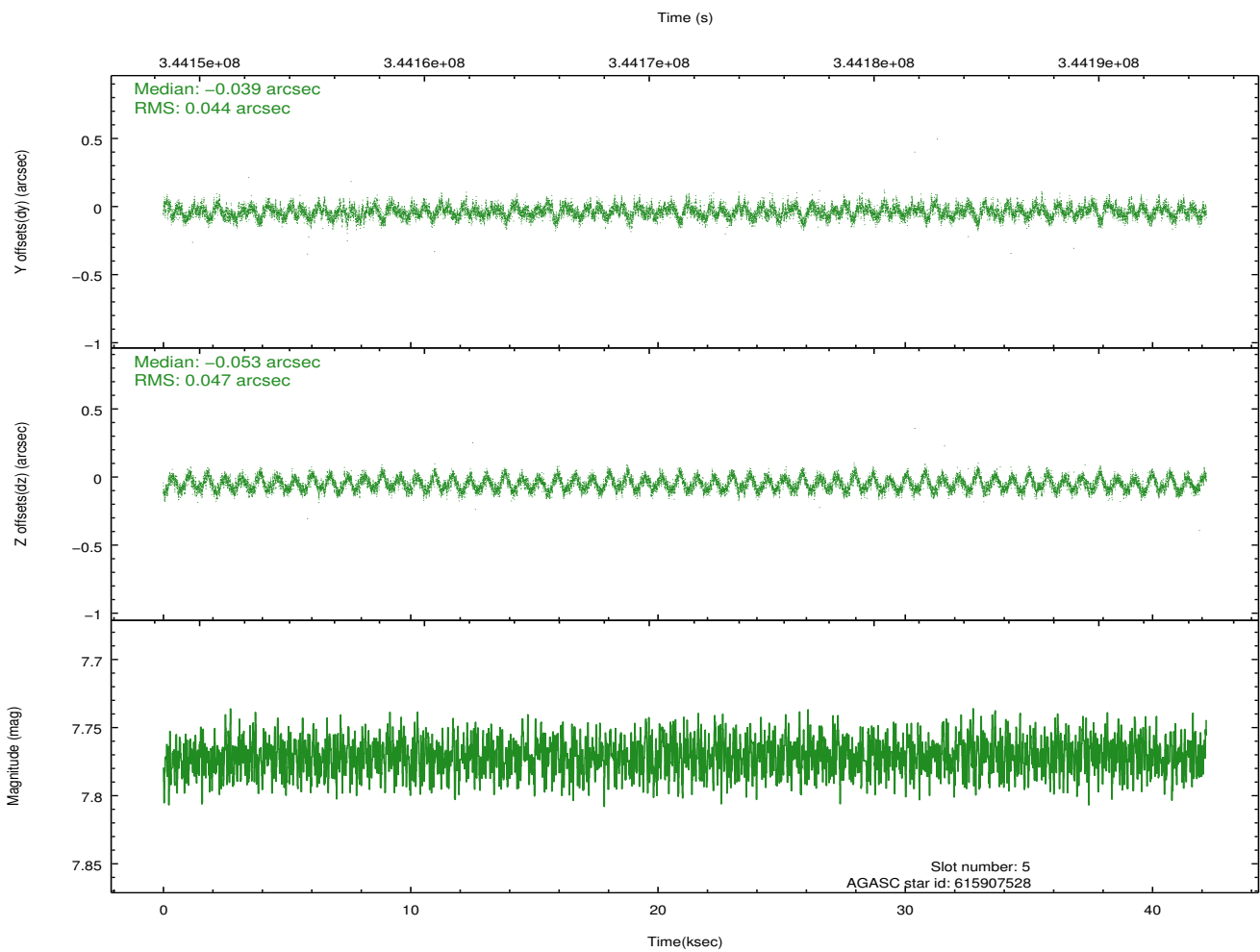
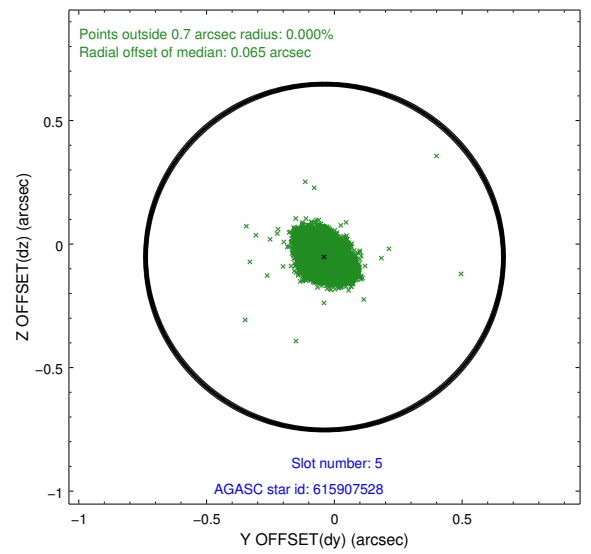
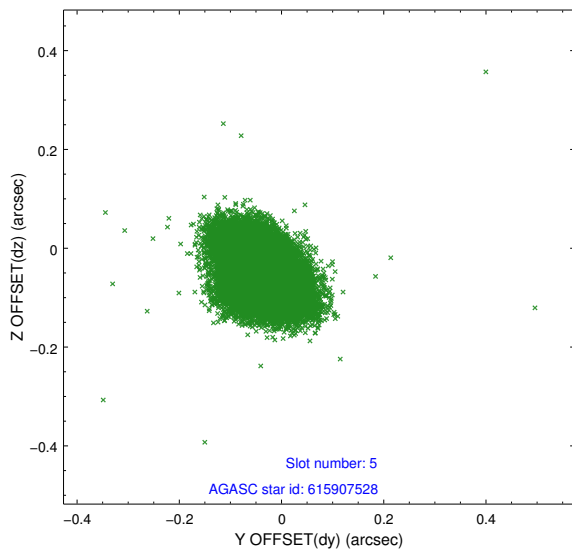
### 2.4.1 Slot 3



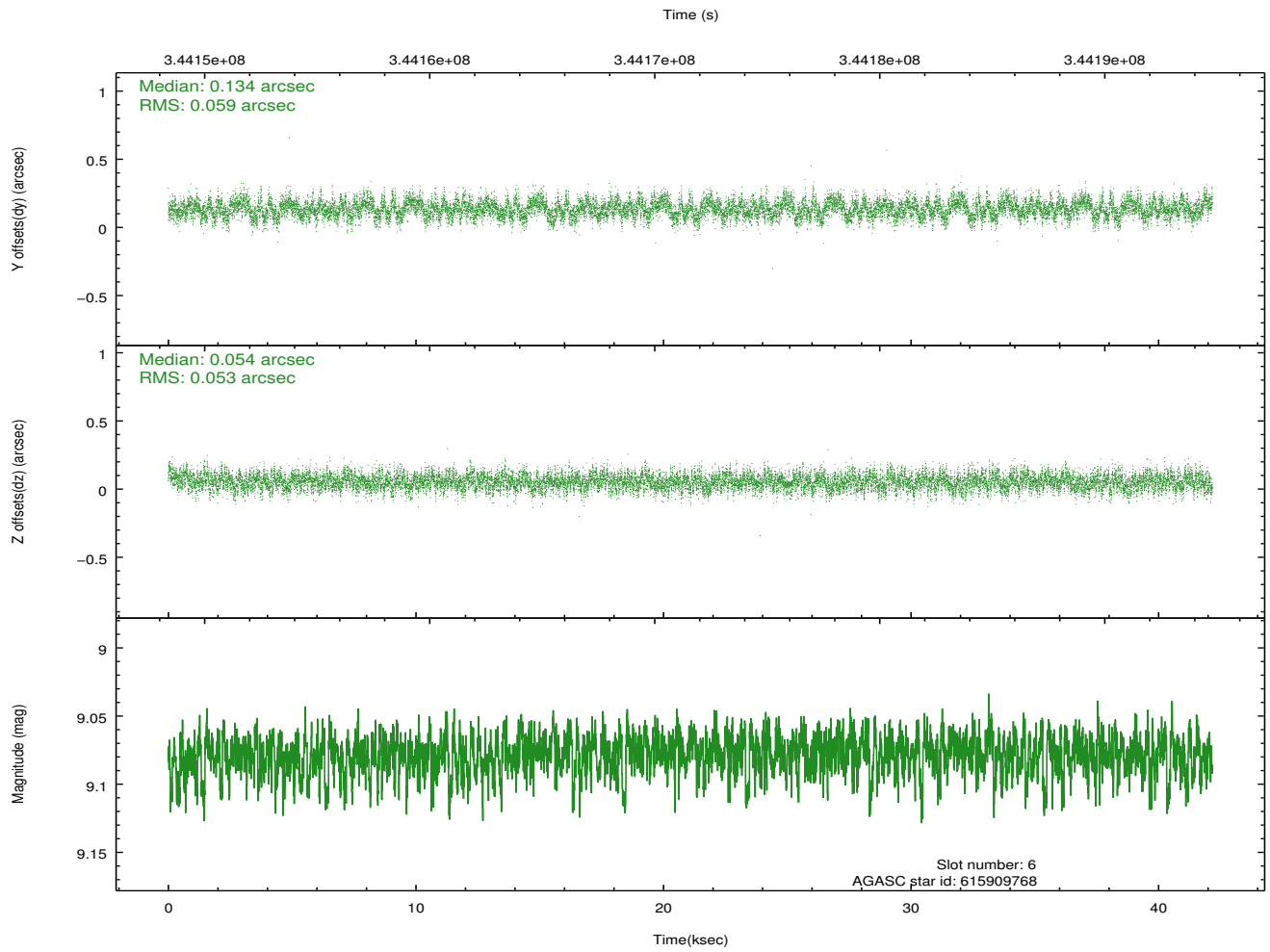
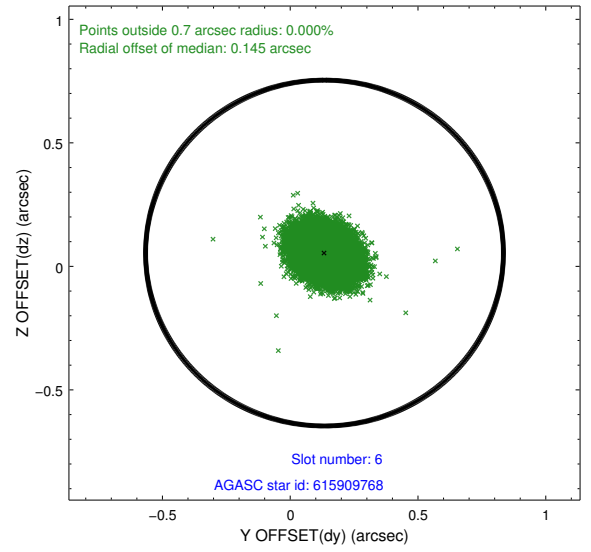
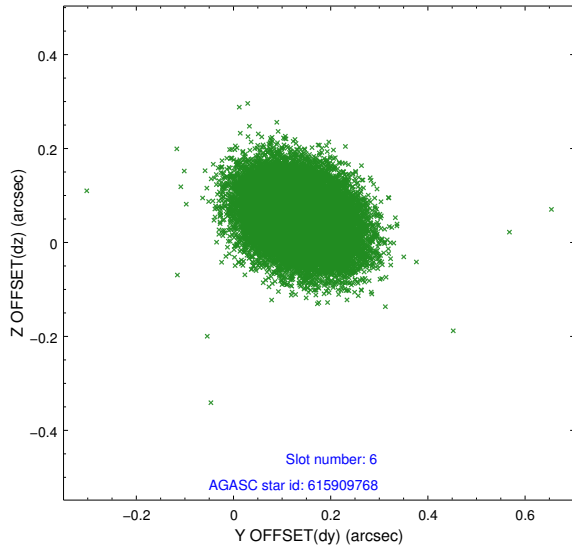
## 2.4.2 Slot 4



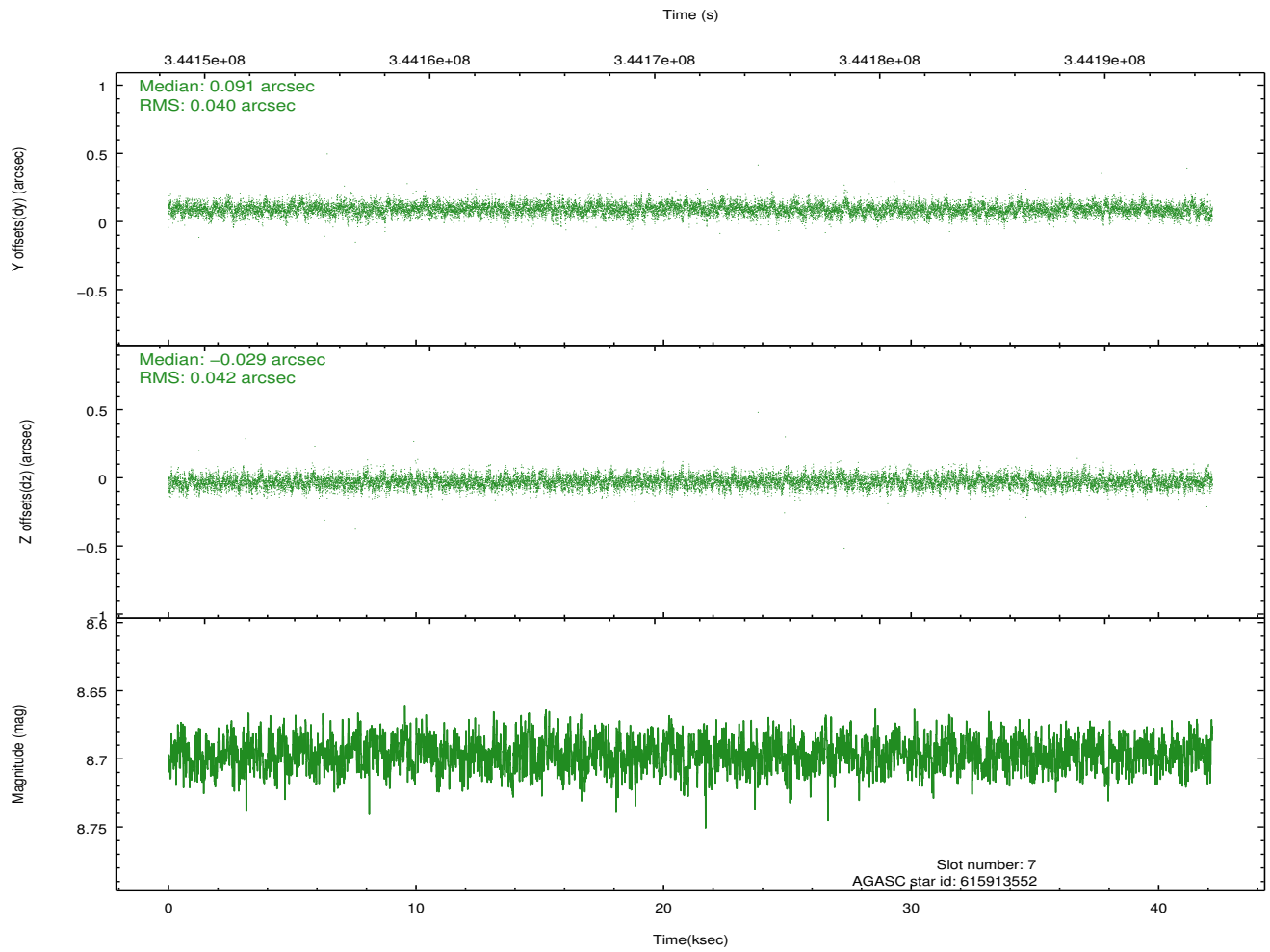
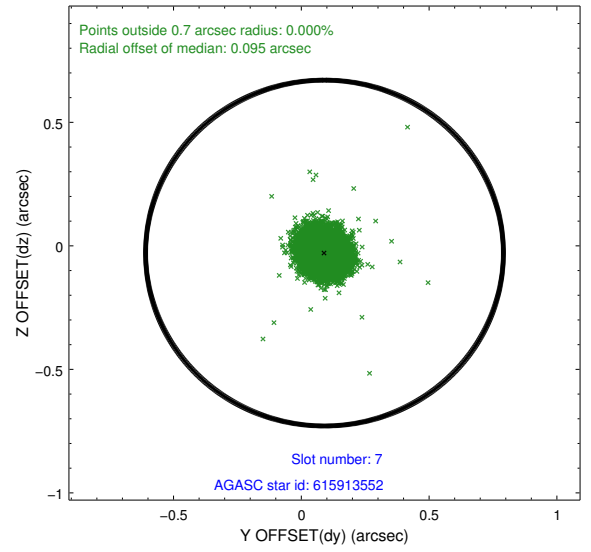
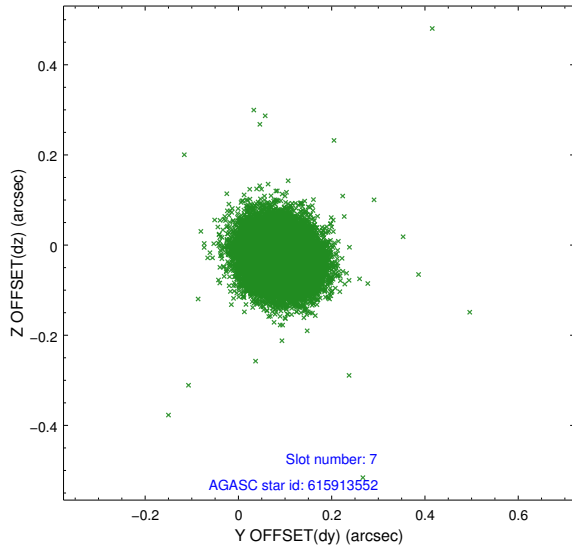
### 2.4.3 Slot 5



### 2.4.4 Slot 6

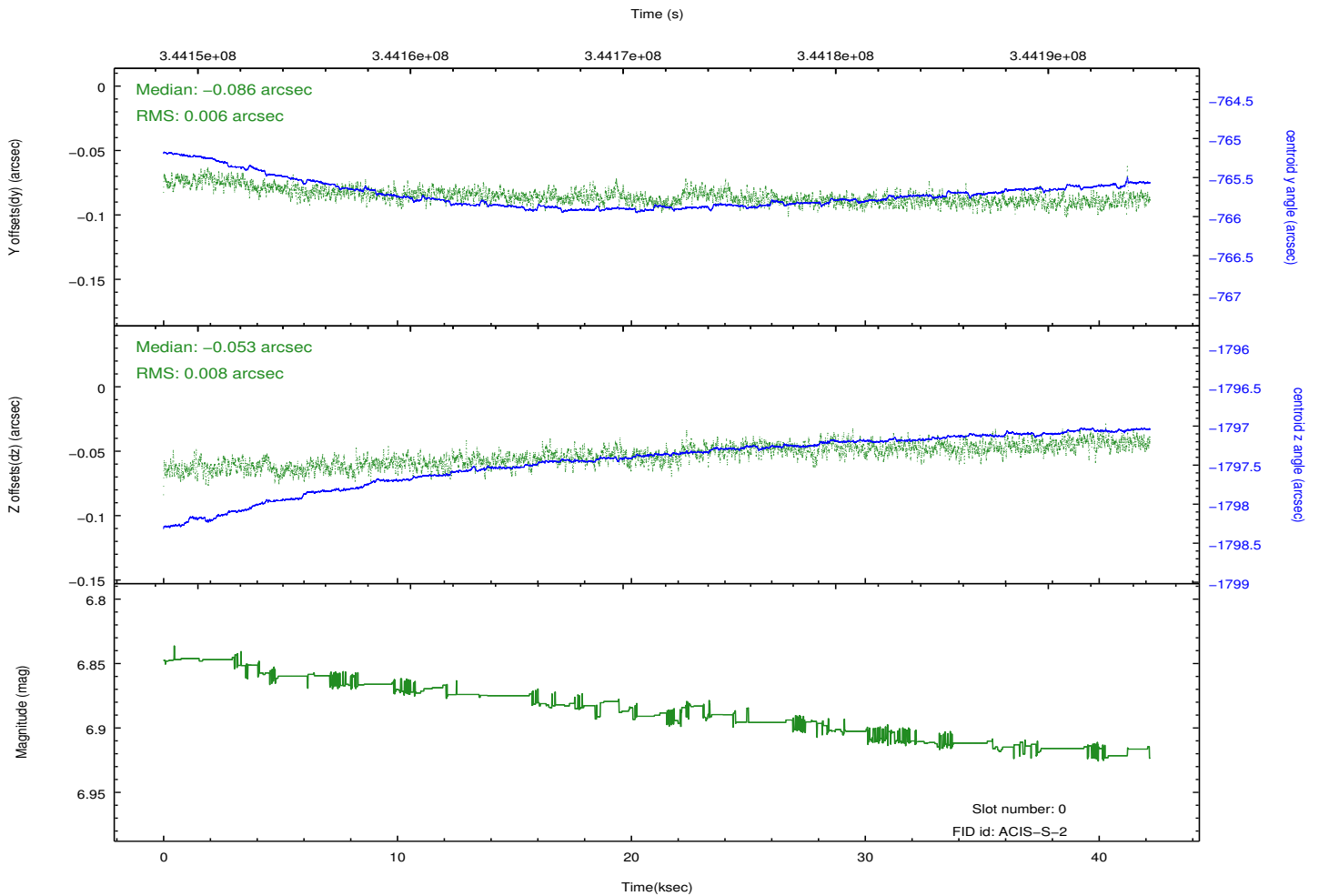
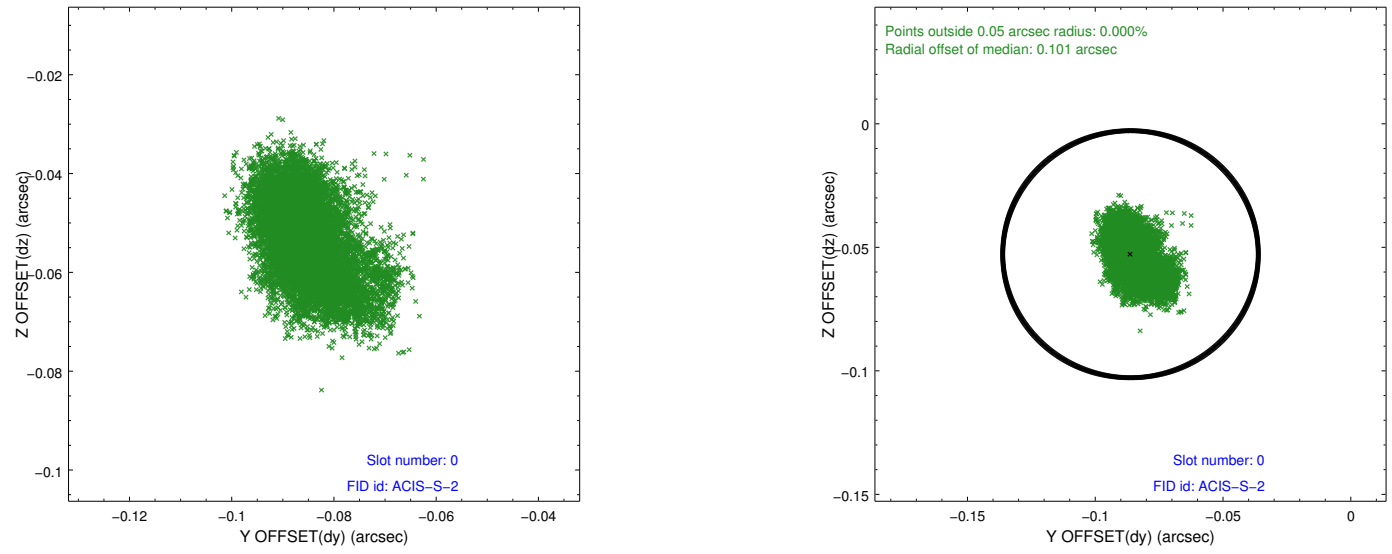


### 2.4.5 Slot 7

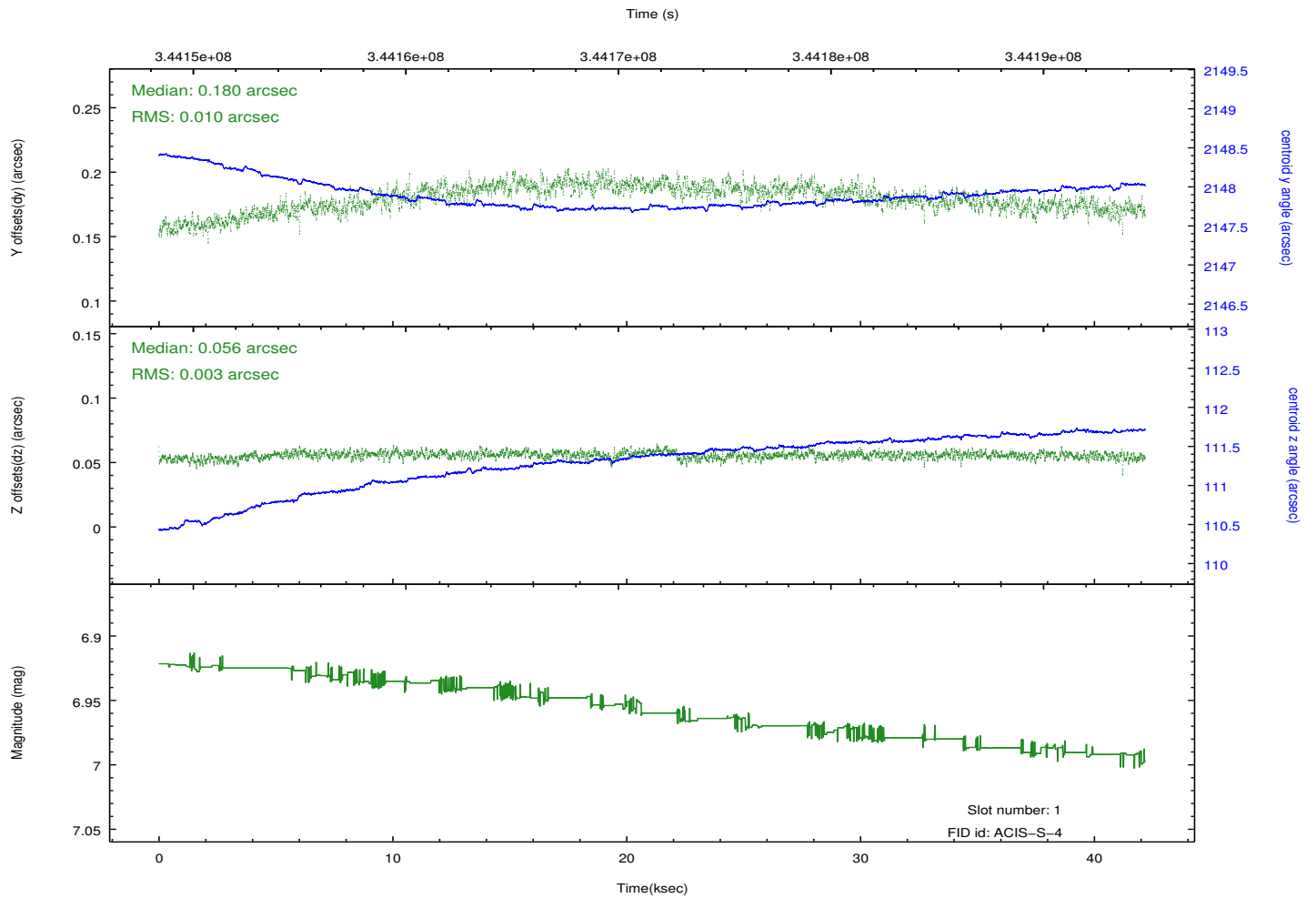
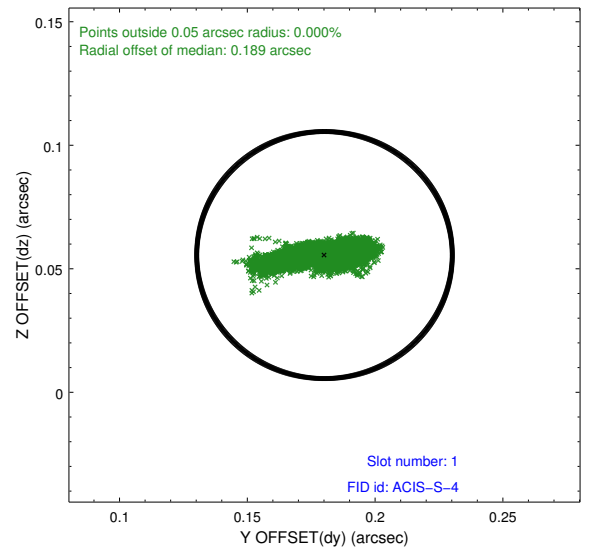
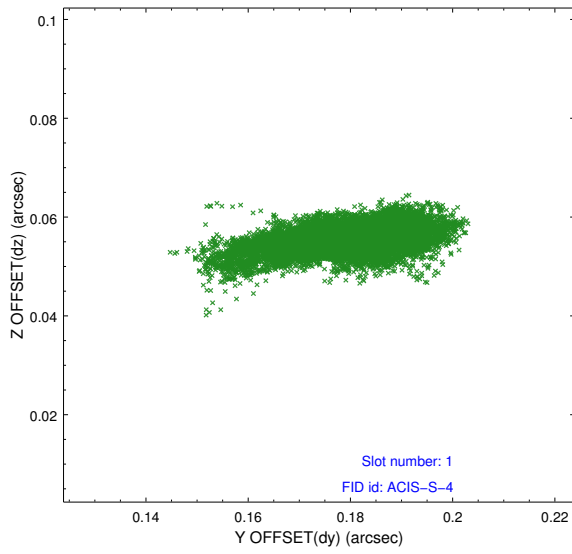


## 2.5 FID Slots

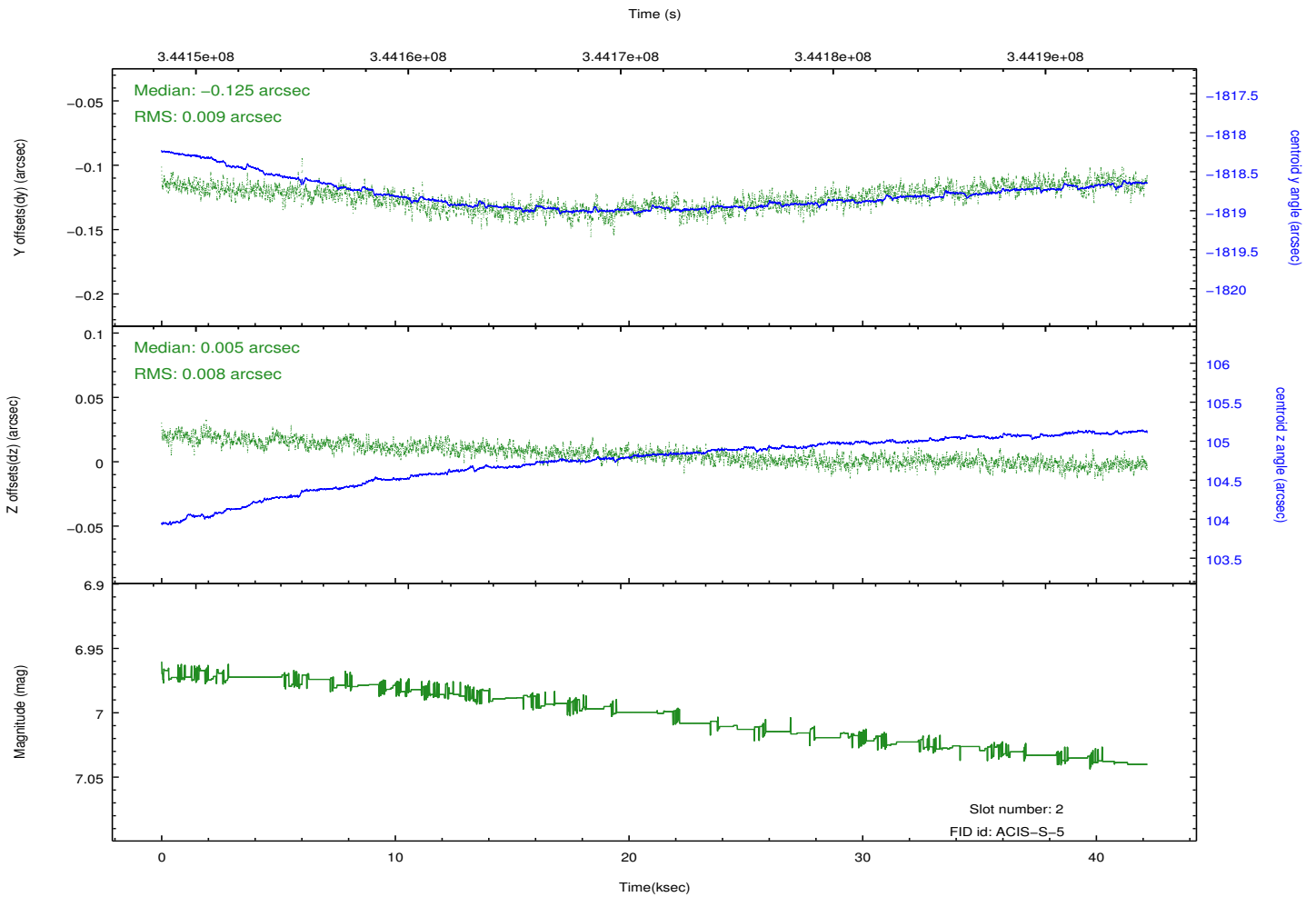
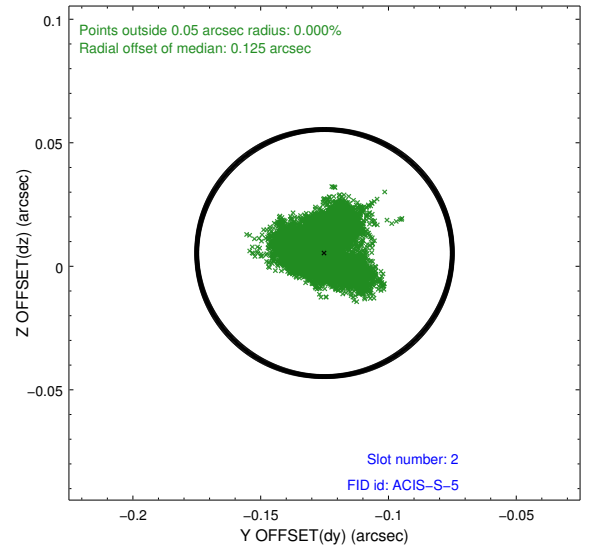
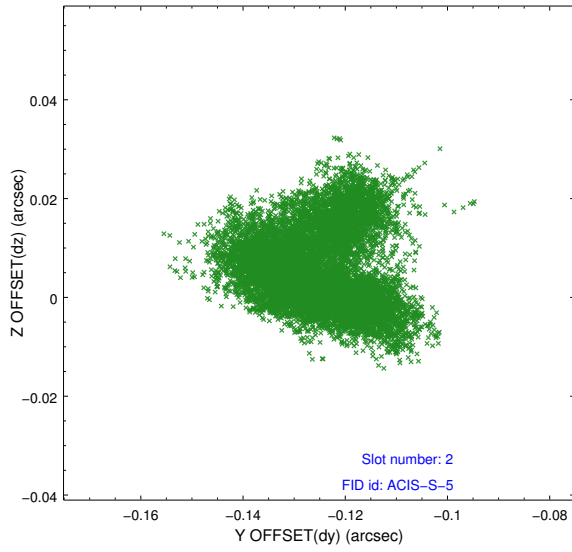
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2

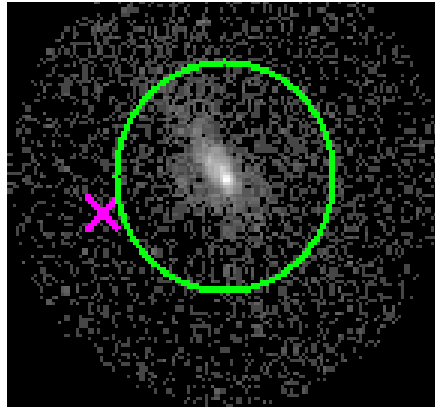


### 3 Gratings

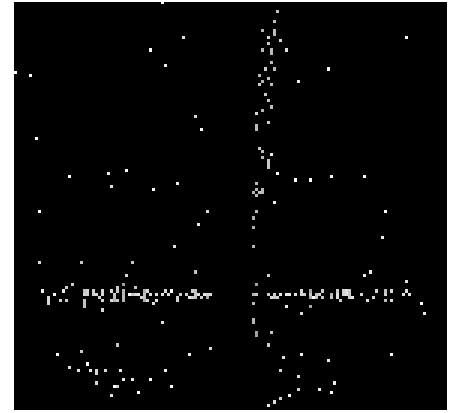
#### 3.1 HEG Arm



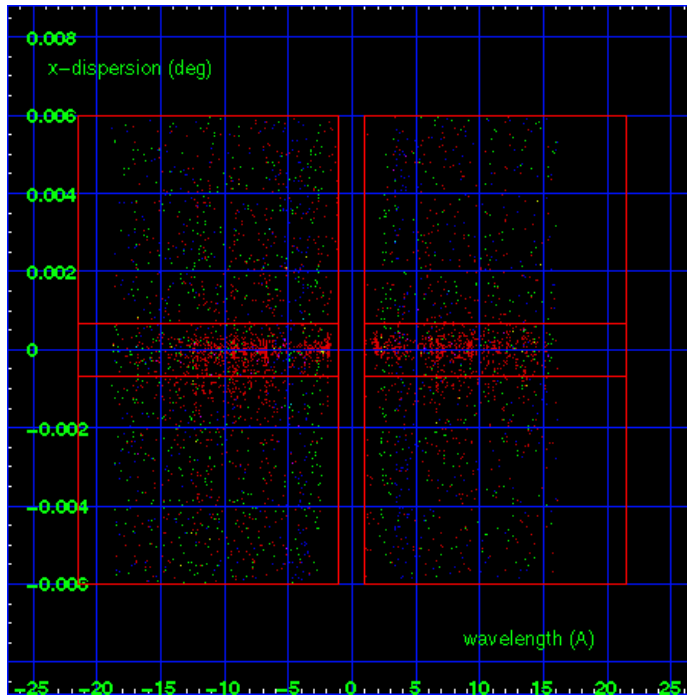
HEG Order Sort 123



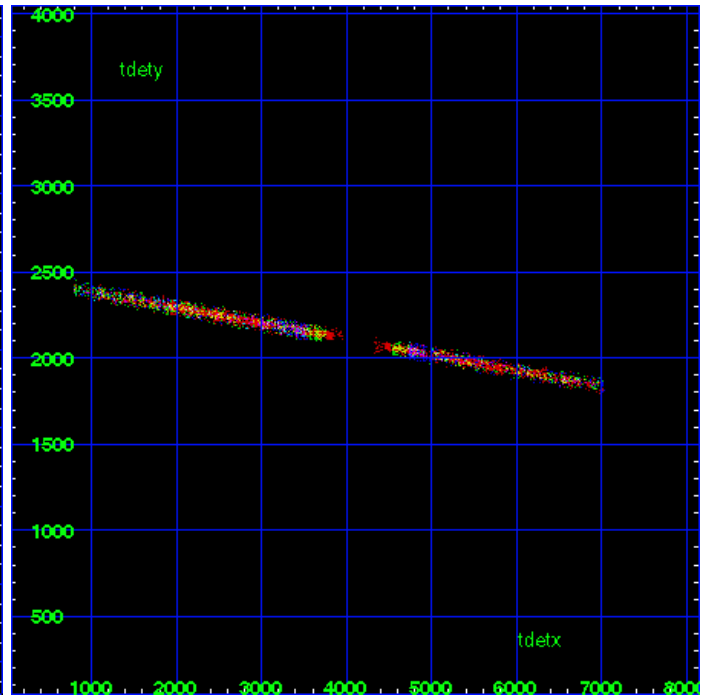
HEG Zero Order



HEG Order Sort ALL

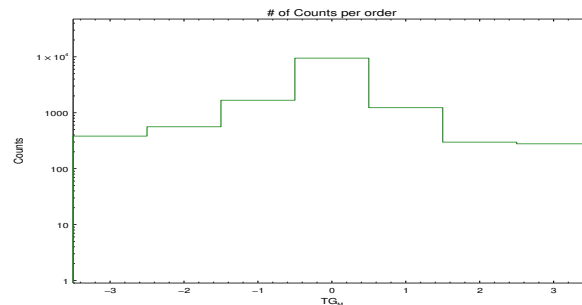


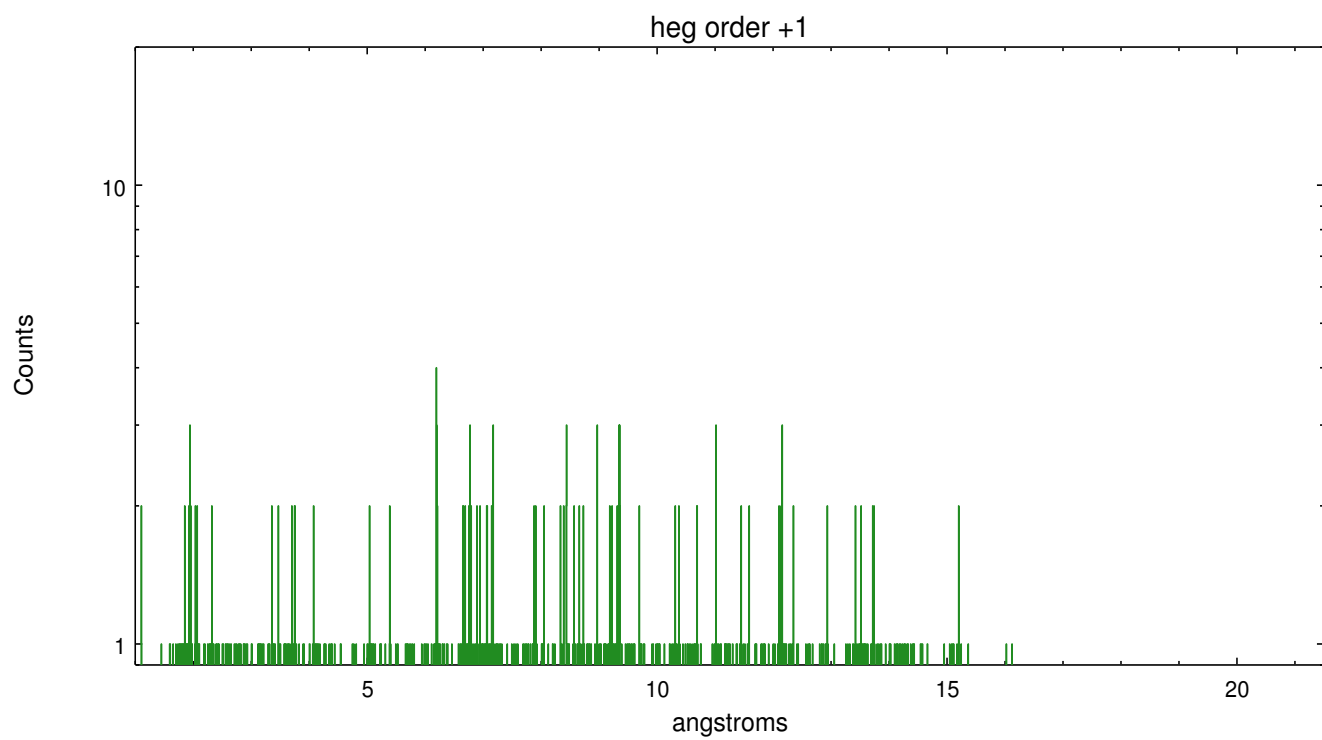
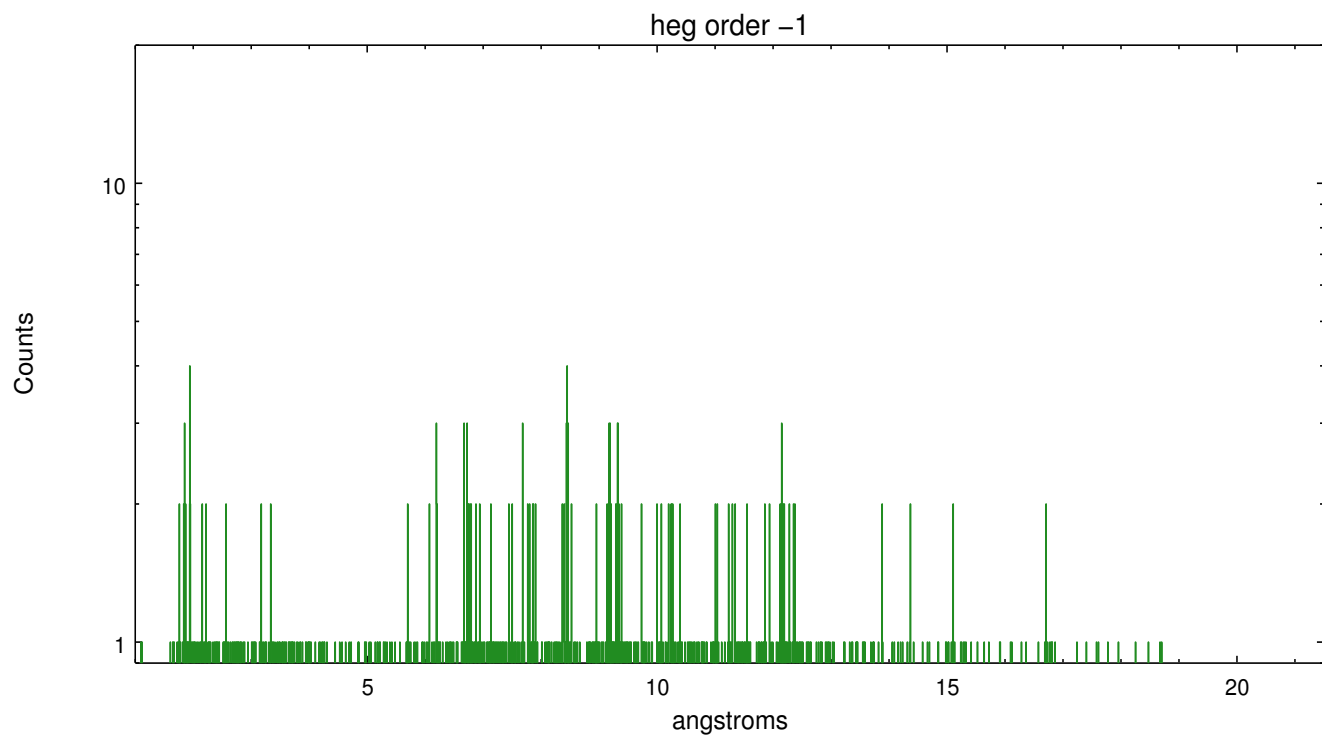
Spot Image HEG



Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	382	561	1673	9475	1231	298	278

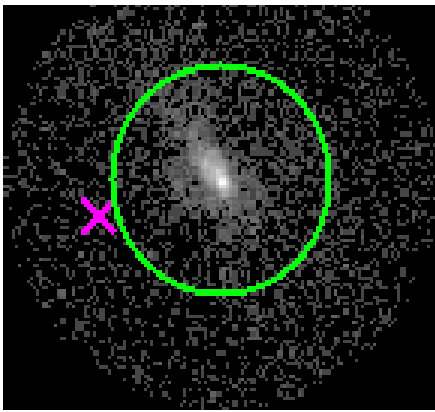




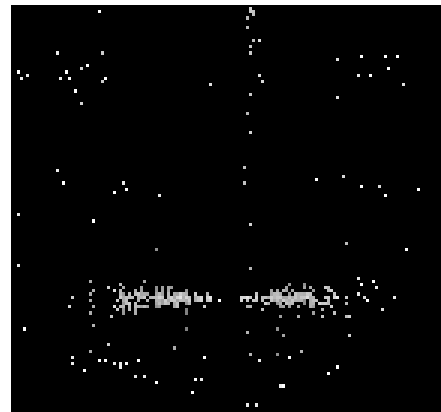
### 3.2 MEG Arm



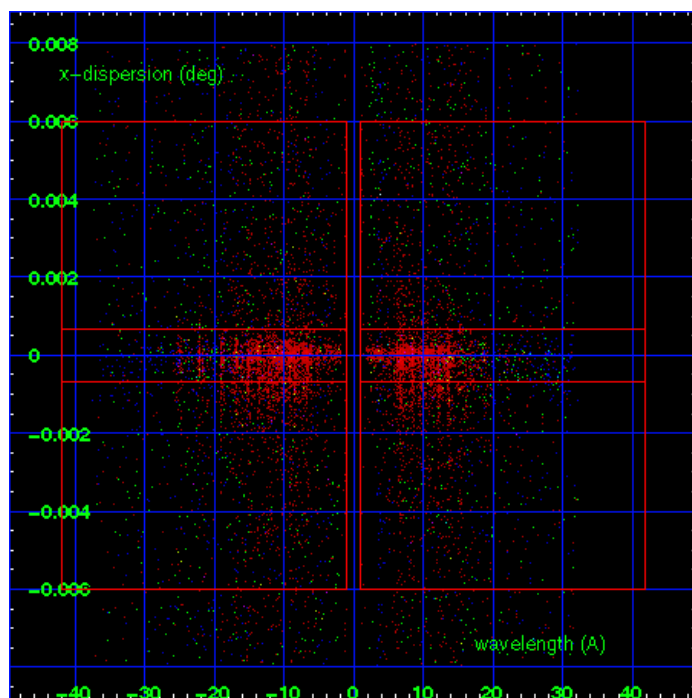
MEG Order Sort 123



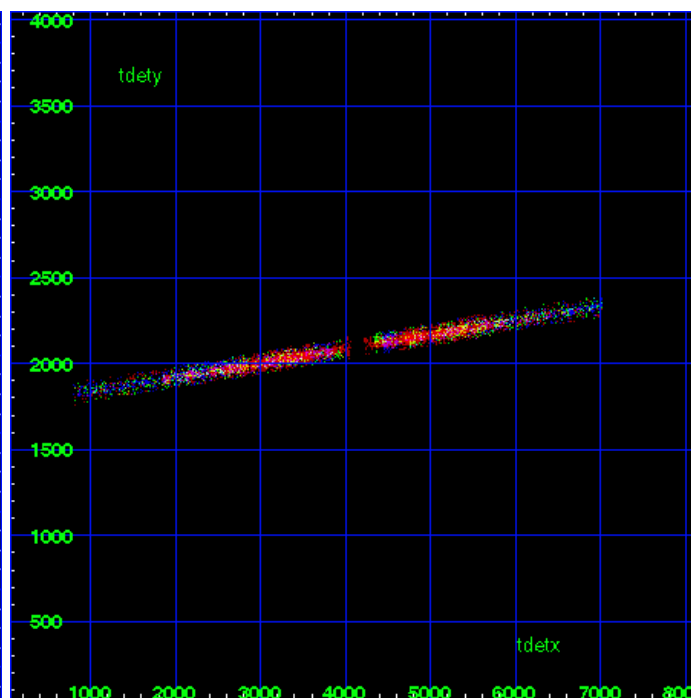
MEG Zero Order



MEG Order Sort ALL

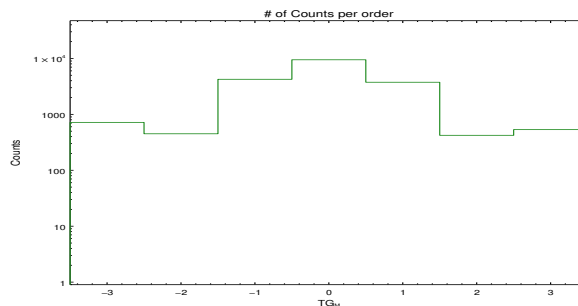


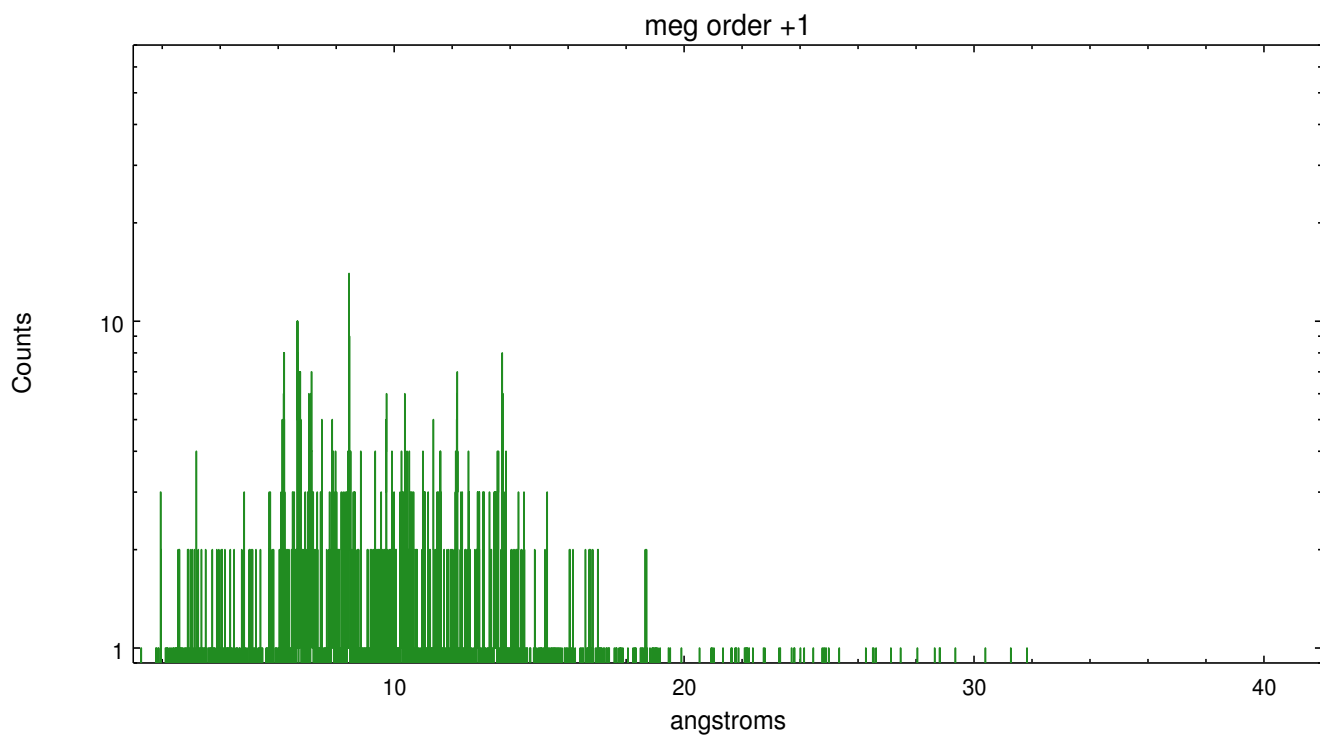
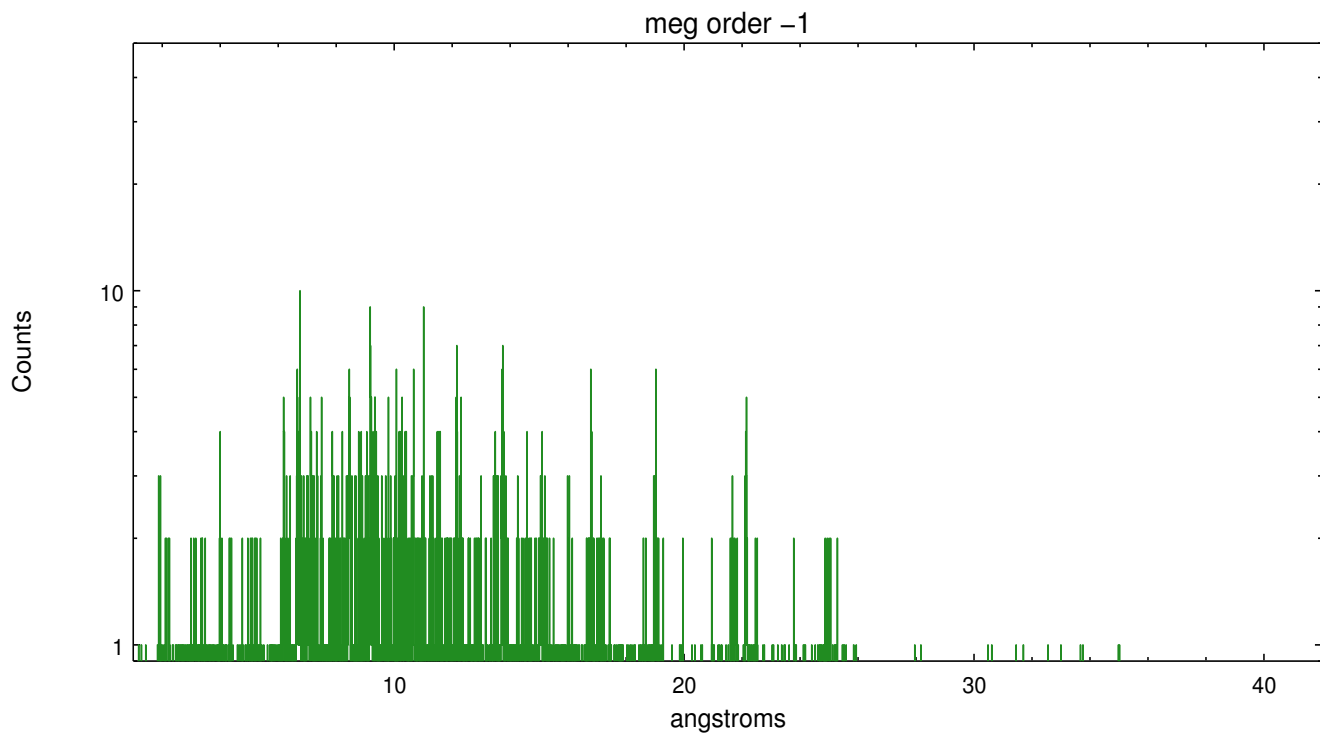
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	719	450	4239	9475	3753	422	534





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.06.07
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	41.7575

## A.2 Comments

Source is extended and asymmetric. Standard software processing technique using the tool `tgdetect` did not give an accurate position for the zeroth order. The zeroth order position used in this processing was manually determined to be the brightest position in the nucleus. The newly determined zeroth order coordinates ( $x=4130.375$ ,  $y=4105.125$ ) have been placed in the `*src1a.fits` file, replacing the coordinates determined by `tgdetect`. Please note that rerunning `tgdetect` for analysis purposes will not give the same zeroth order position as that used in this processing.

===

Roll constraint met.

===

WARNING: there are no standard ciao tools for analysis of grating spectra from extended sources. The shape of an emission 'line' will be the shape of the zero order spatial structure convolved with the instrumental LSF. Grating extractions can be used, but need to be combined with custom spatial-spectral analysis, since wavelength is multi-valued at any particular diffraction angle.