

# V&V Reference Report

## L2 ASCDS Version : 10.5

Observation 18364 - L2 Version 2  
Chandra X-Ray Center

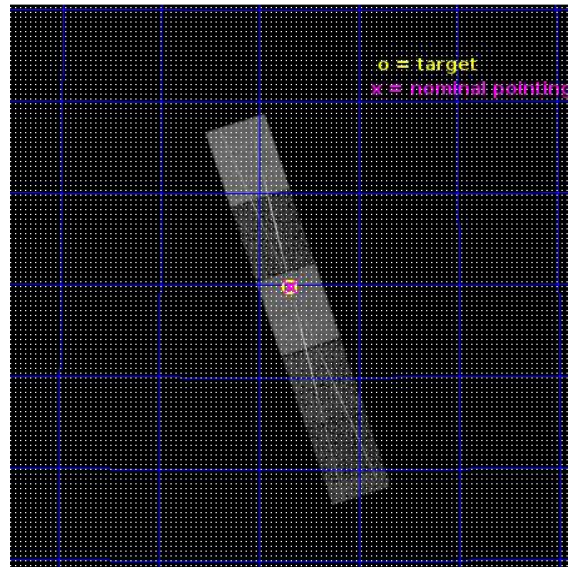
L2 Processing Date : Jul 28 2016

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# 1 Front

seq_num	291259	Sequence number
obs_id	18364	Observation id
title	AO-17 Internal Cross-Calibration Study	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	Capella	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	79.172917	Observer's specified target RA [deg]
dec_targ	45.996389	Observer's specified target Dec [deg]
ra_nom	79.169675387456	Nominal RA [deg]
dec_nom	45.997511440184	Nominal Dec [deg]
roll_nom	71.848441055235	Nominal Roll [deg]
revision	2	Processing version of data
ontime	15045.599850416	Sum of GTIs [s]
liveltime	14792.645610477	Livetime [s]
ontime5	15045.599850416	Sum of GTIs [s]
ontime6	15045.599850416	Sum of GTIs [s]
ontime7	15045.599850416	Sum of GTIs [s]
ontime8	15045.599850416	Sum of GTIs [s]
ontime9	15045.599850416	Sum of GTIs [s]
l2events	152575	Number of level 2 events

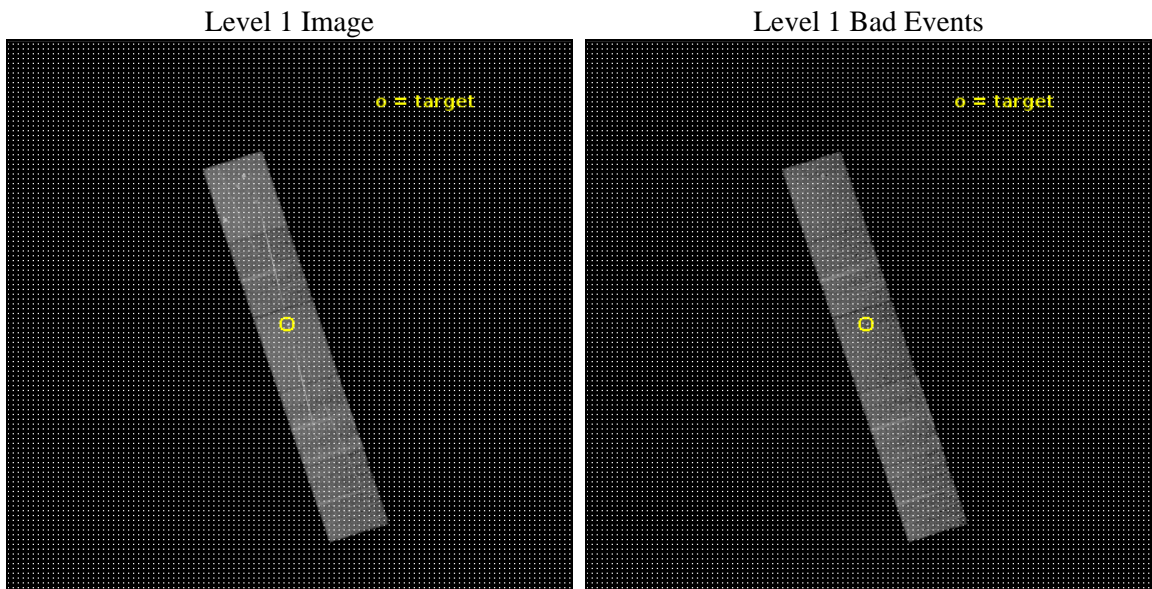




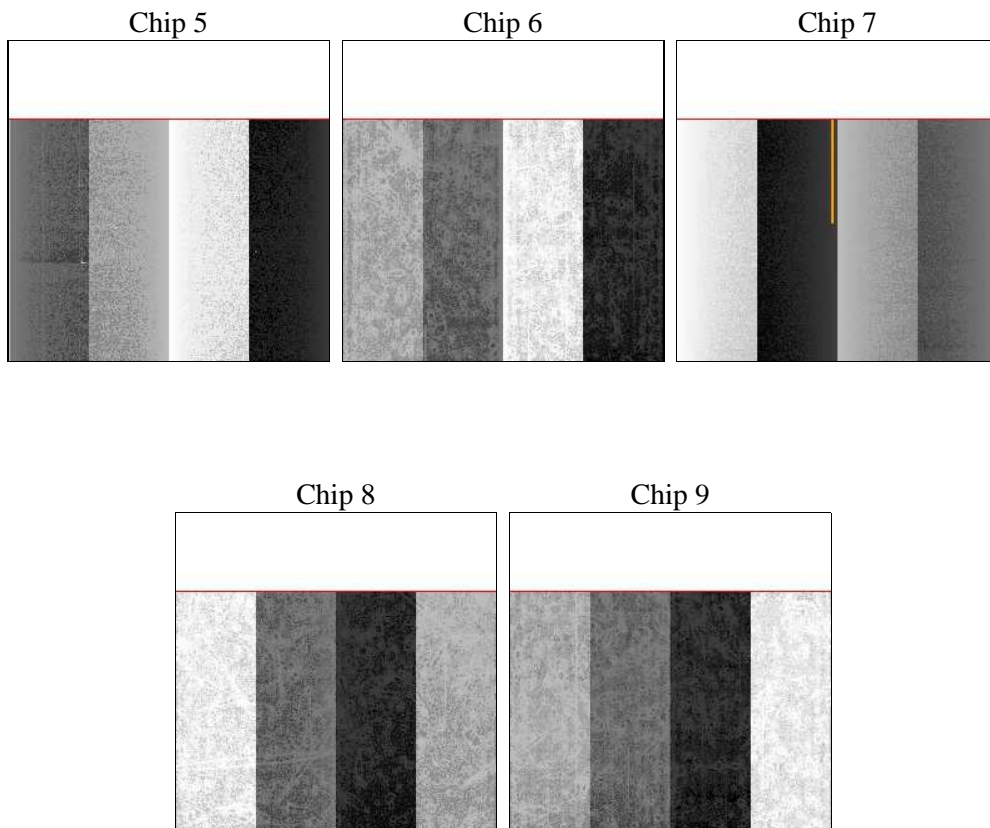
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	15000.000000	[s] Scheduled observation exposure time
ascdsver	10.5	Processing system revision	ontime	15045.599850416	Sum of GTIs [s]
caldsver	4.7.2	&#160	ontime5	15045.599850416	Sum of GTIs [s]
date	2016-07-29T00:26:33	Date and time of file creation	ontime6	15045.599850416	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	15045.599850416	Sum of GTIs [s]
			ontime8	15045.599850416	Sum of GTIs [s]
			ontime9	15045.599850416	Sum of GTIs [s]
			l1events	497246	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			zo_pos	(4081.28, 4086.53)	src1a sky pixel position
					src1a sky pixel position via

### 2.1.4 Events

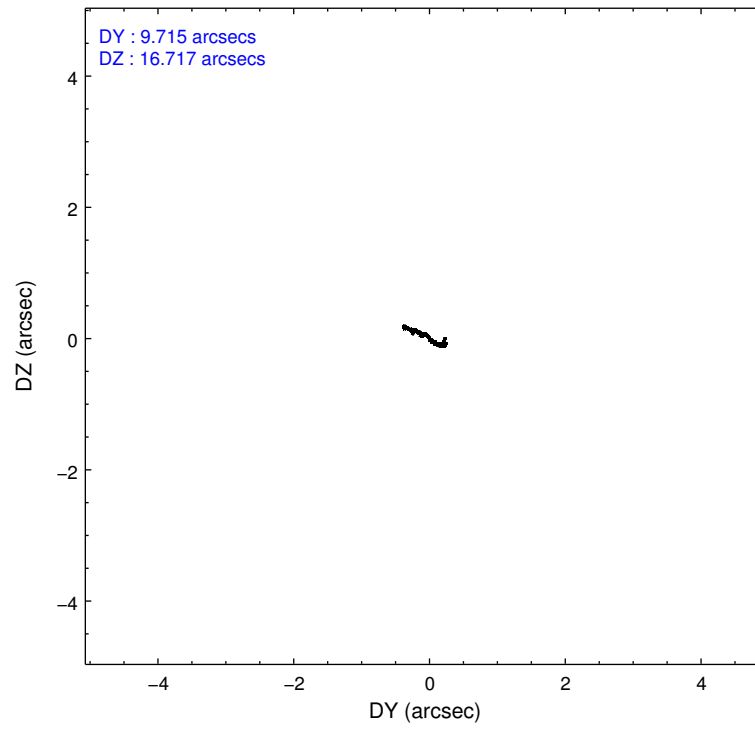
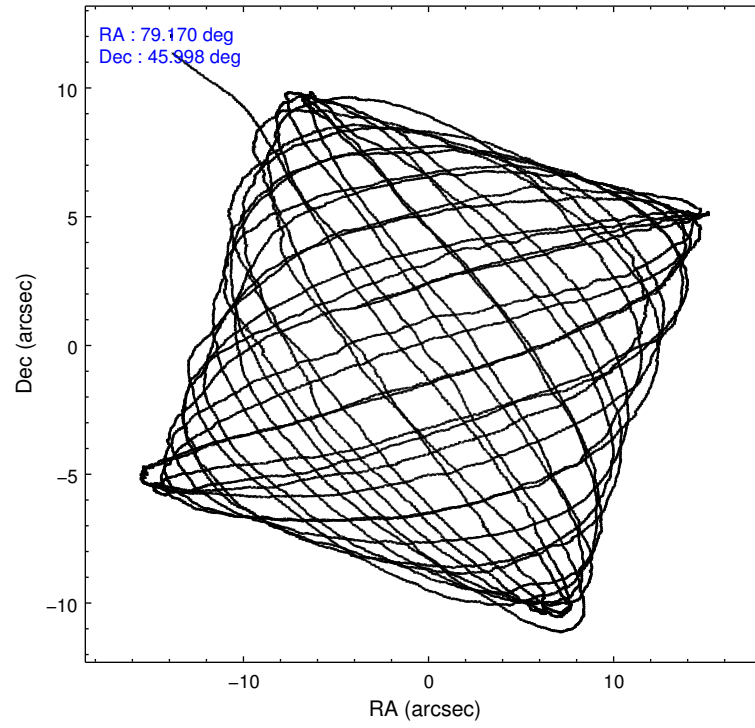
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	126664	84145	108967	104765	72705
rejected events	60147	66007	55687	70071	62222
rejected %	47%	78%	51%	66%	85%

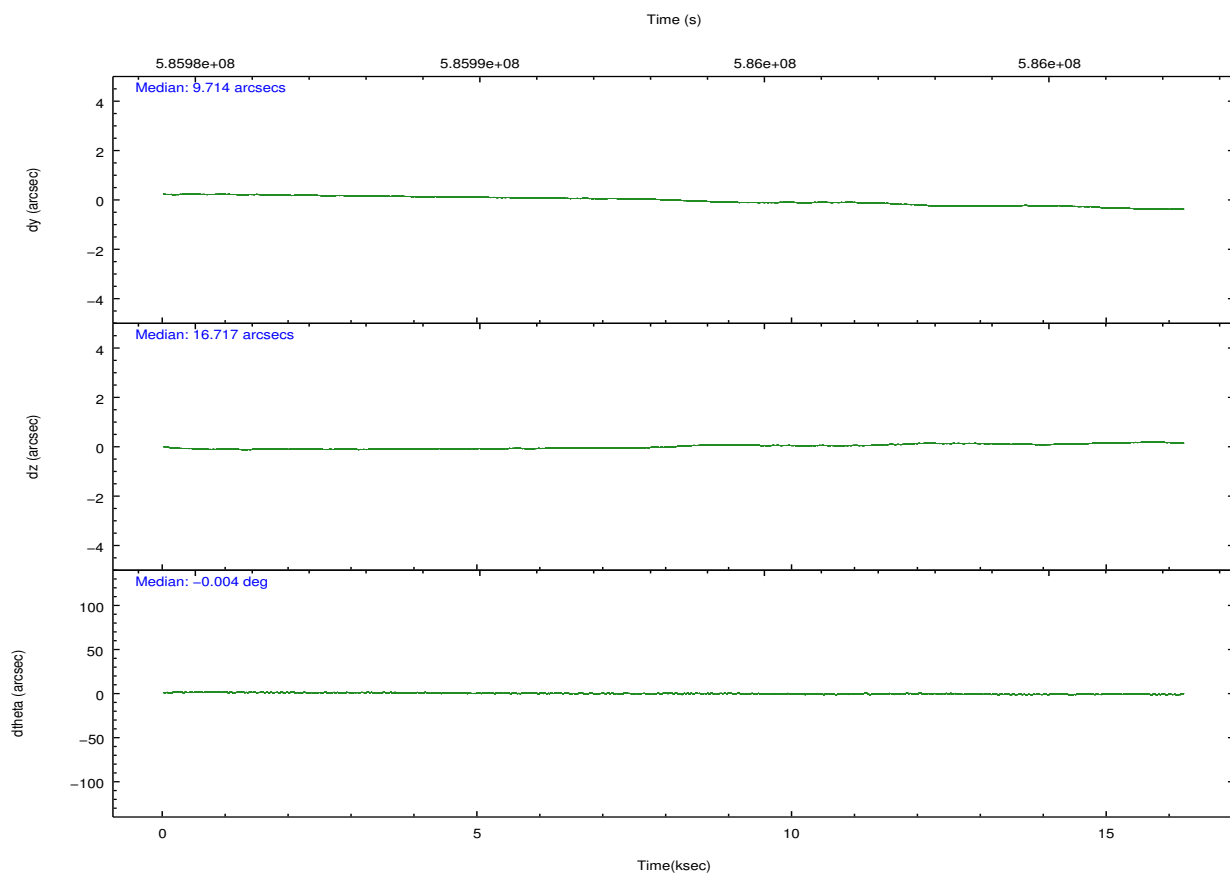
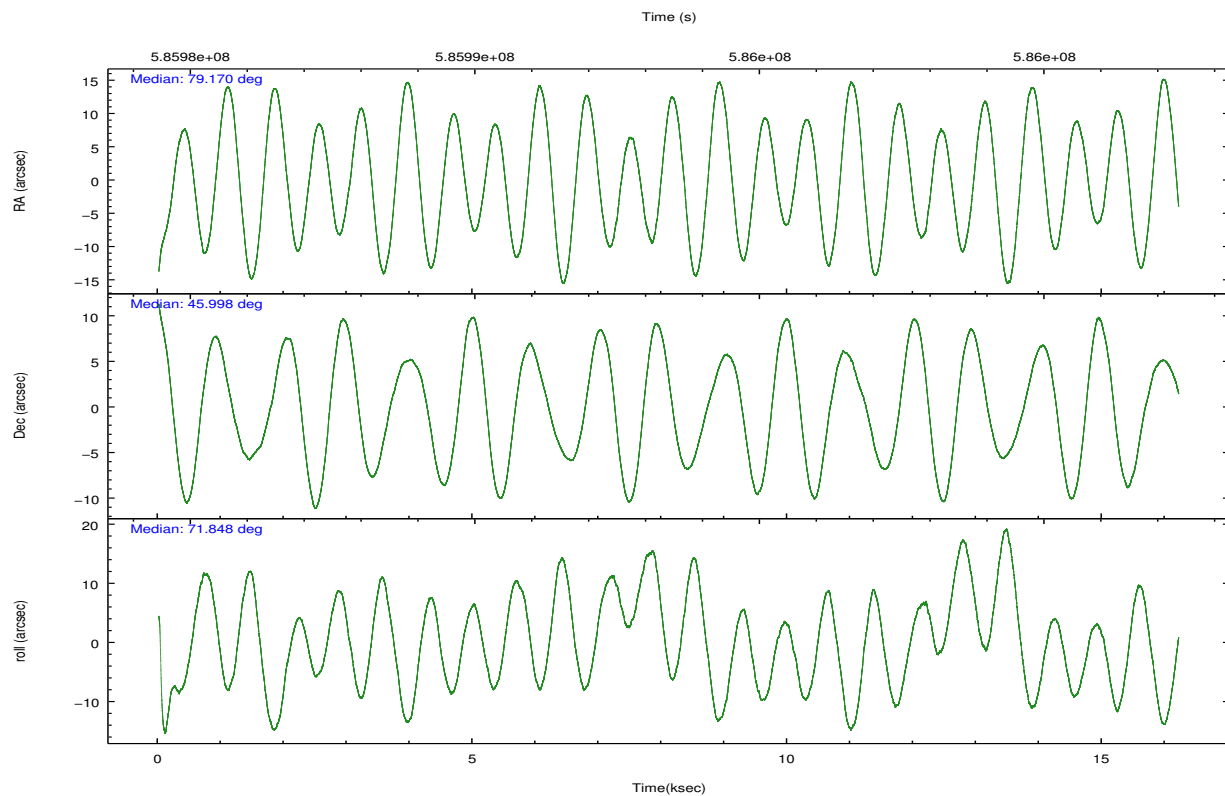
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	11277	10648	6411	14716	4408
	8%	12%	5%	14%	6%
grade 1 events	229	78	302	76	42
	0%	0%	0%	0%	0%
grade 2 events	19243	3049	11393	7068	2183
	15%	3%	10%	6%	3%
grade 3 events	2847	1140	5048	2875	994
	2%	1%	4%	2%	1%
grade 4 events	2708	1233	4819	2774	952
	2%	1%	4%	2%	1%
grade 5 events	9186	3488	10643	5227	3824
	7%	4%	9%	4%	5%
grade 6 events	30455	2074	25618	7264	1950
	24%	2%	23%	6%	2%
grade 7 events	50719	62435	44733	64765	58352
	40%	74%	41%	61%	80%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-56789	ACIS-56789	Obspar file type	PREDICTED	ACTUAL
Grating	HETG	HETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	79.178277	79.16967538745561	CCD I2 on	N	N
[deg] Pointing Dec	45.970716	45.99751144018401	CCD I3 on	N	N
[deg] Pointing Roll	71.685615	71.8484410552345	CCD S0 on	N	N
[mm] SIM focus pos	-0.684267	-0.6828225247311905	CCD S1 on	Y	Y
[mm] SIM defocus	0	0.001444936568705701	CCD S2 on	Y	Y
[mm] SIM translation stage pos	-187.132523	-187.1228876879999	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-3	-3.009634895007935	CCD S4 on	Y	Y
[s] Observation start time (MET)	585986512.184000	585984986.80277	CCD S5 on	O1	Y
Observation start date	2016-07-27T06:00:44	2016-07-27T05:36:26	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	586001512.184000	586002534.80378	On-chip summing requested	N	N
Observation end date	2016-07-27T10:10:44	2016-07-27T10:28:54	Subarray requested	CUSTOM	CUSTOM
Read mode	TIMED	TIMED	Subarray start row	1	1
			Subarray row count	774	774
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	2.4

## 2.3 Aspect



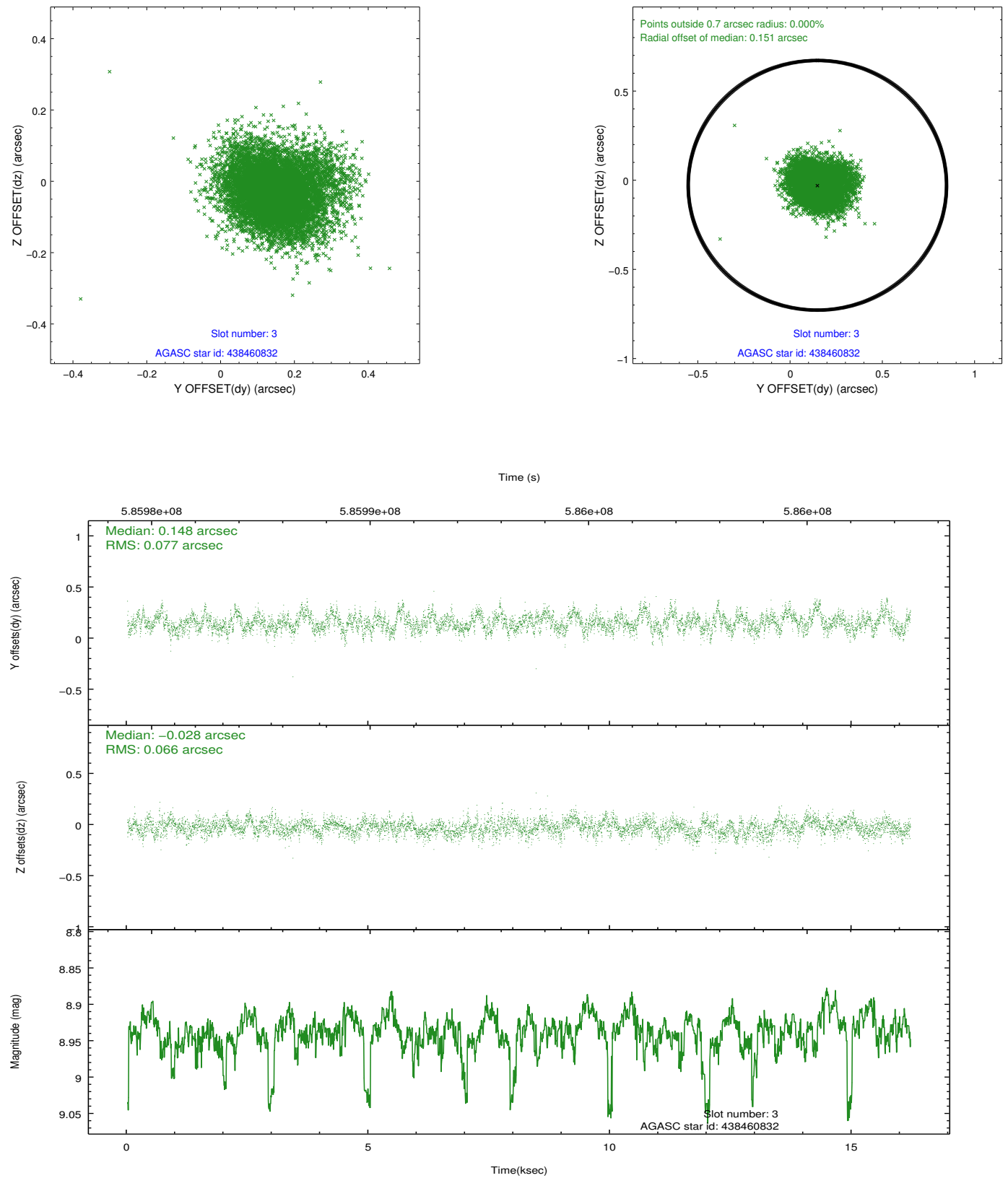


### Slot Statistics

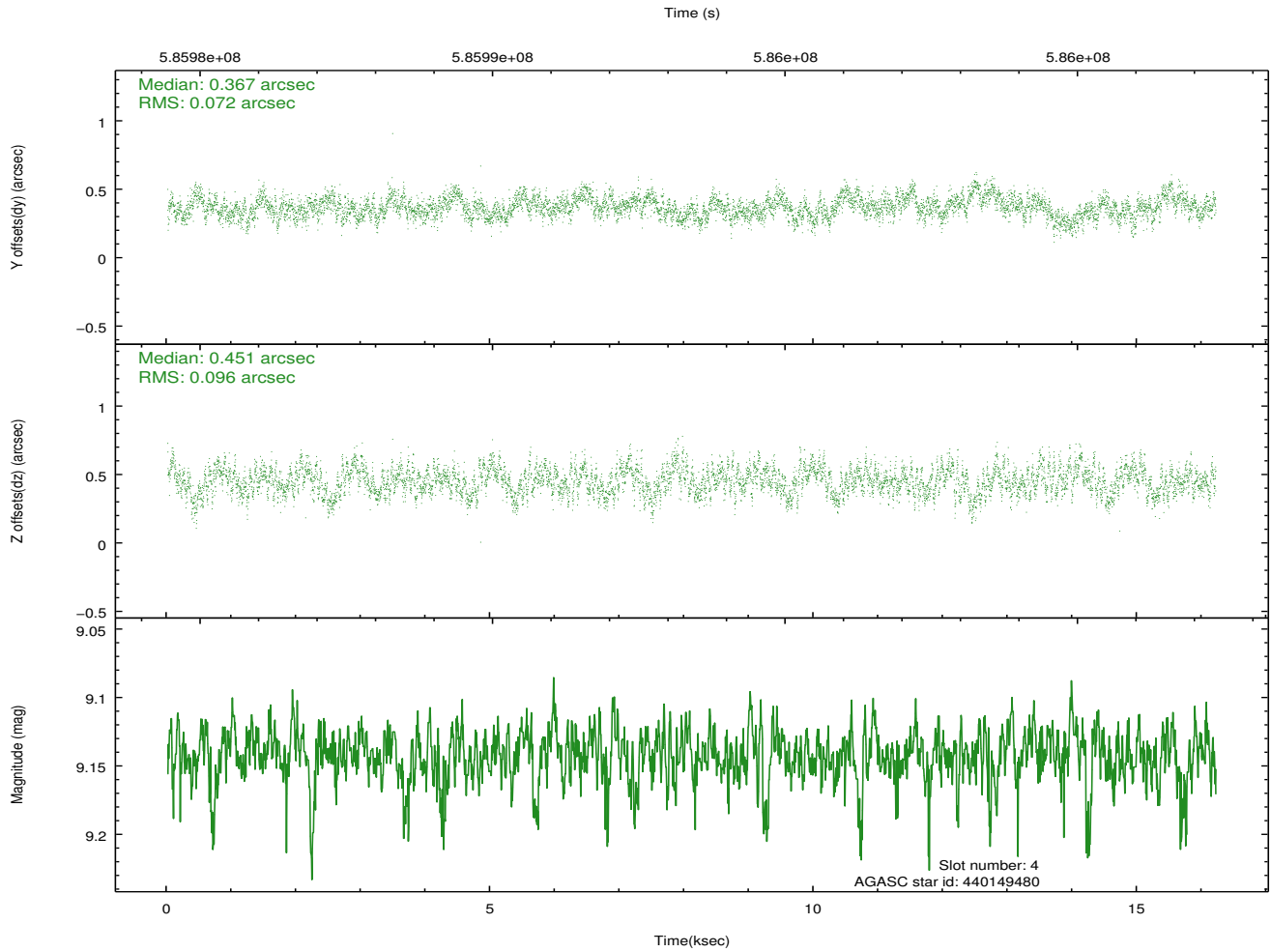
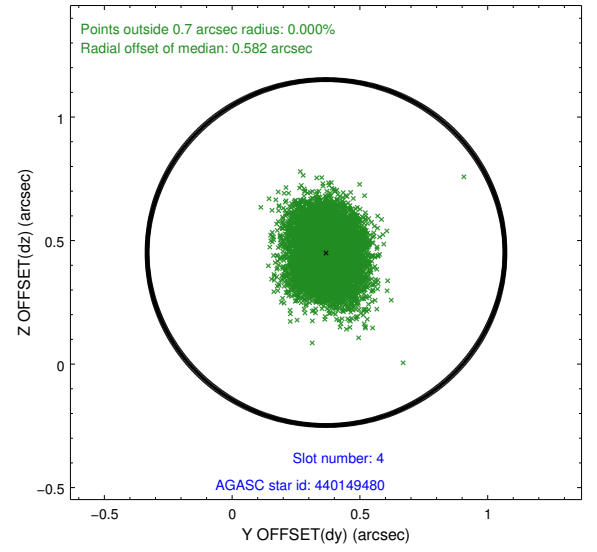
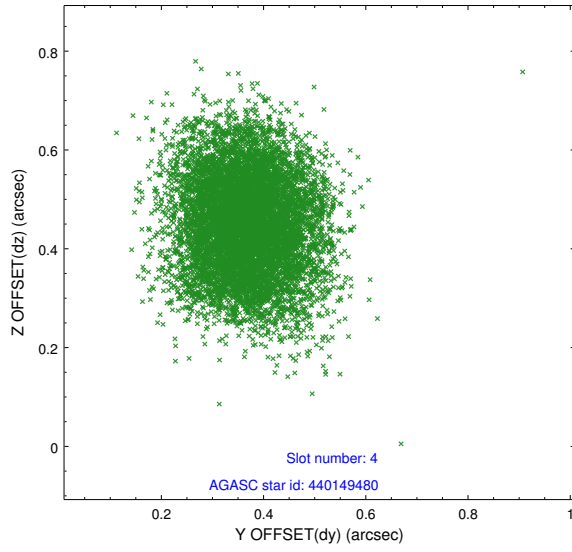
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	6.86	3953	-0.148	-0.075	0.012	0.018	0.000000	0.000000	-762.45	-1800.37
1	FID		ACIS-S-4	6.96	3953	0.334	0.092	0.010	0.018	0.000000	0.000000	2151.19	107.98
2	FID		ACIS-S-5	6.99	3953	-0.217	-0.008	0.008	0.013	0.000000	0.000000	-1815.02	101.86
3	GUIDE	used	438460832	8.94	7901	0.148	-0.028	0.106	0.178	78.414614	45.554782	-2018.01	1359.68
4	GUIDE	used	440149480	9.14	7898	0.367	0.451	0.129	0.205	79.794341	45.220426	-2067.58	-2329.36
5	GUIDE	used	440150048	7.09	7906	-0.212	-0.182	0.097	0.156	79.112838	46.416060	1470.57	657.62
6	GUIDE	used	438461584	9.20	7900	0.051	-0.106	0.155	0.255	78.061532	45.583834	-2187.73	2239.71
7	GUIDE	used	440140240	9.90	7890	-0.360	-0.143	0.246	0.352	78.889349	46.726437	2359.34	1532.52

## 2.4 Star Slots

### 2.4.1 Slot 3

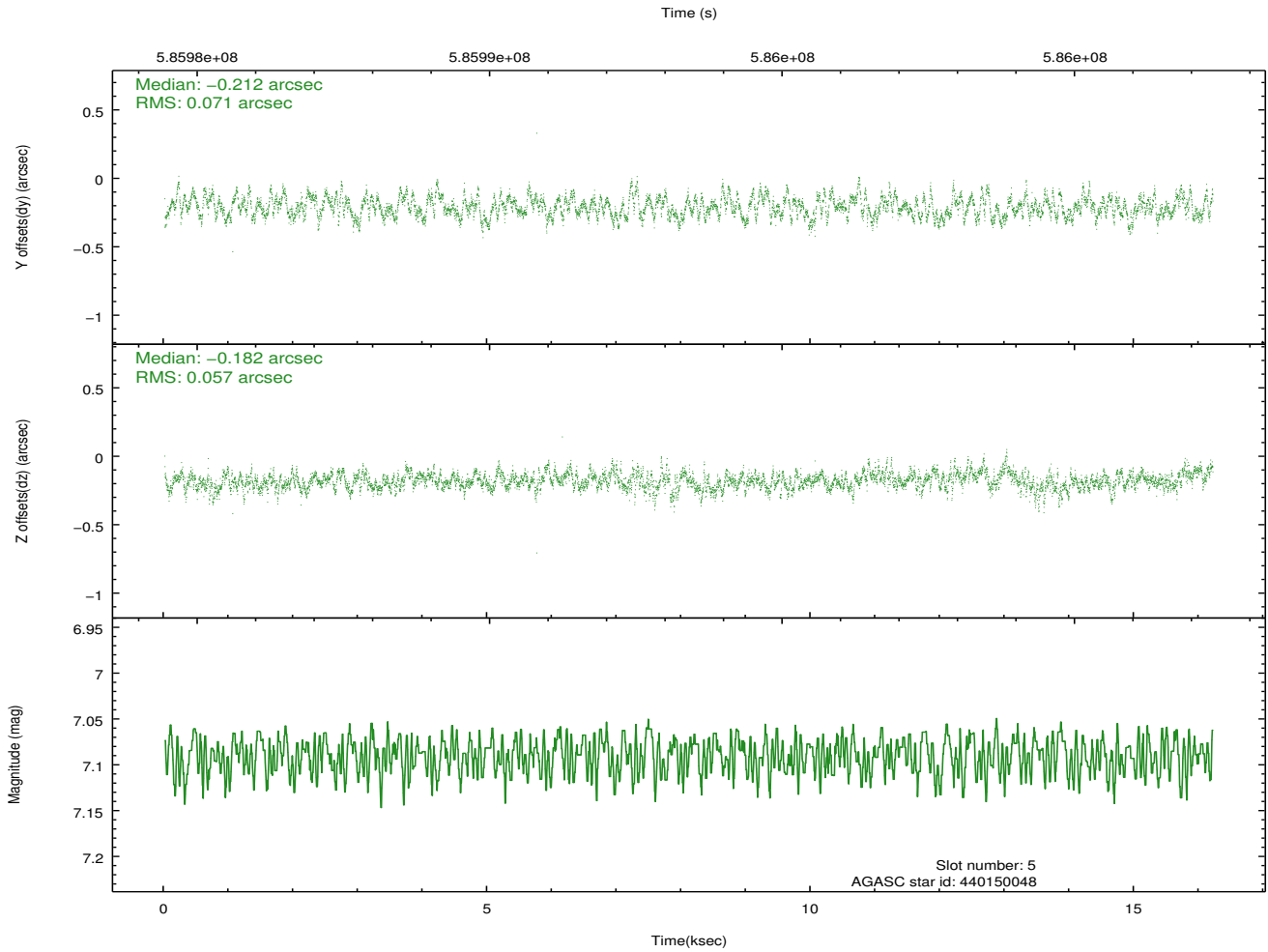
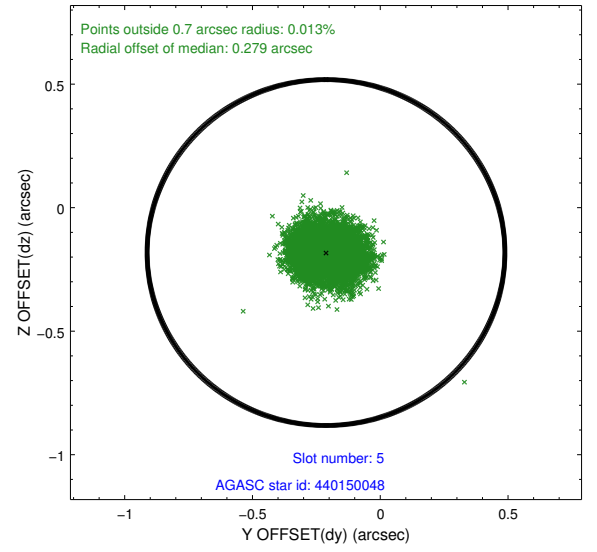
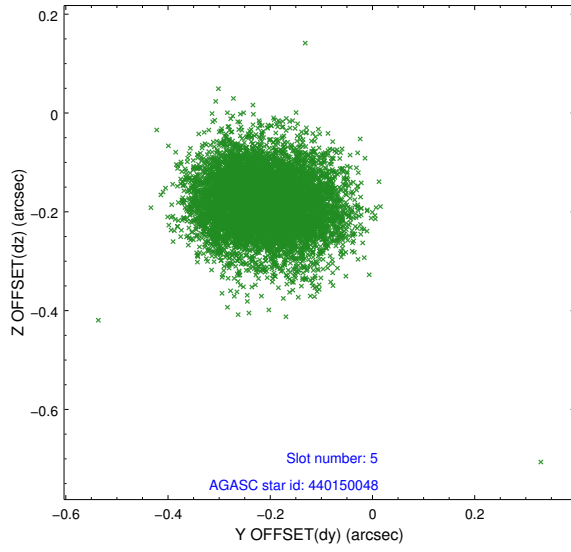


## 2.4.2 Slot 4

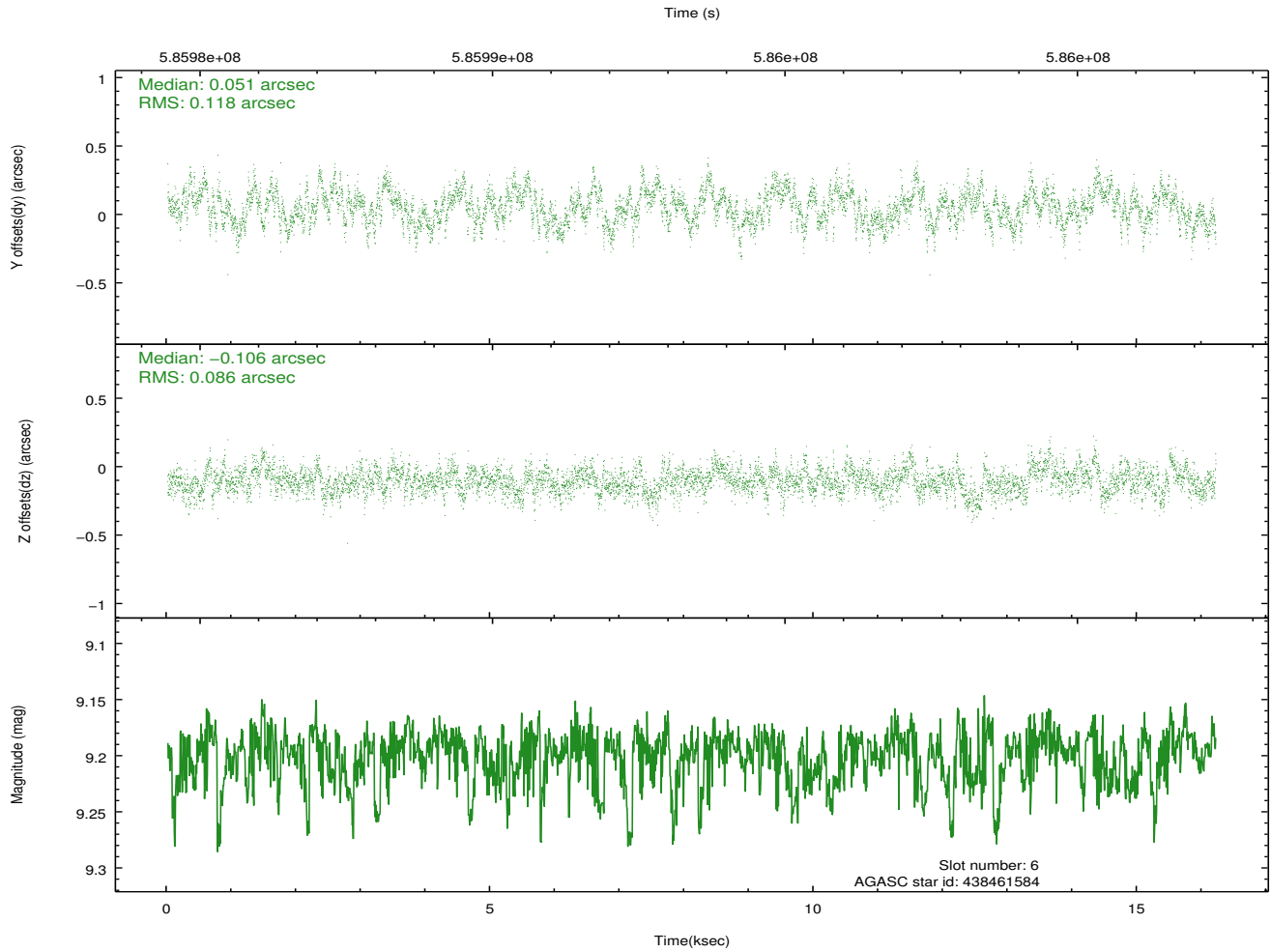
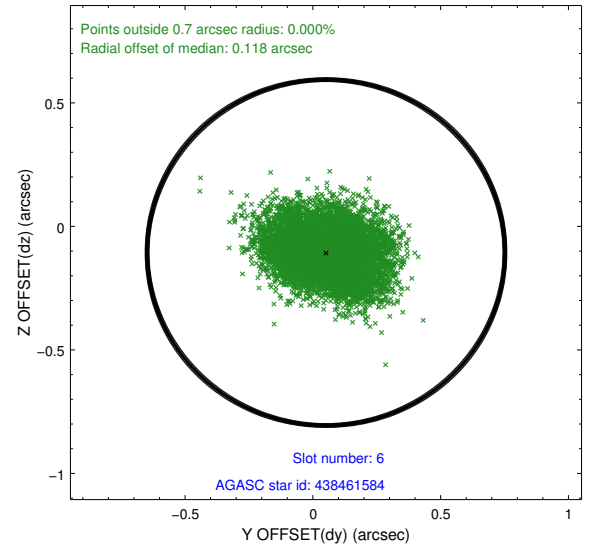
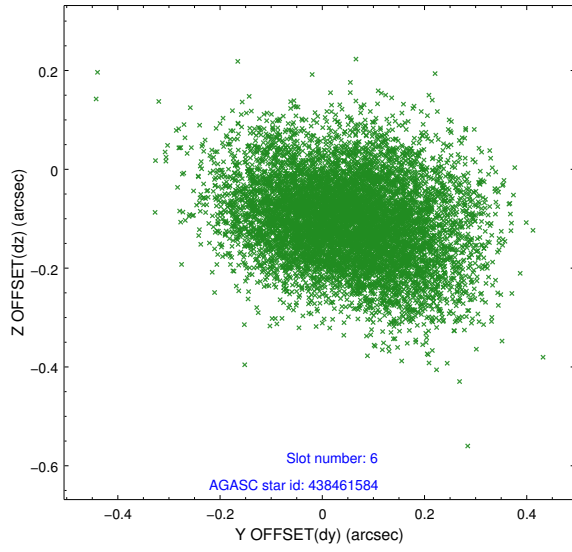




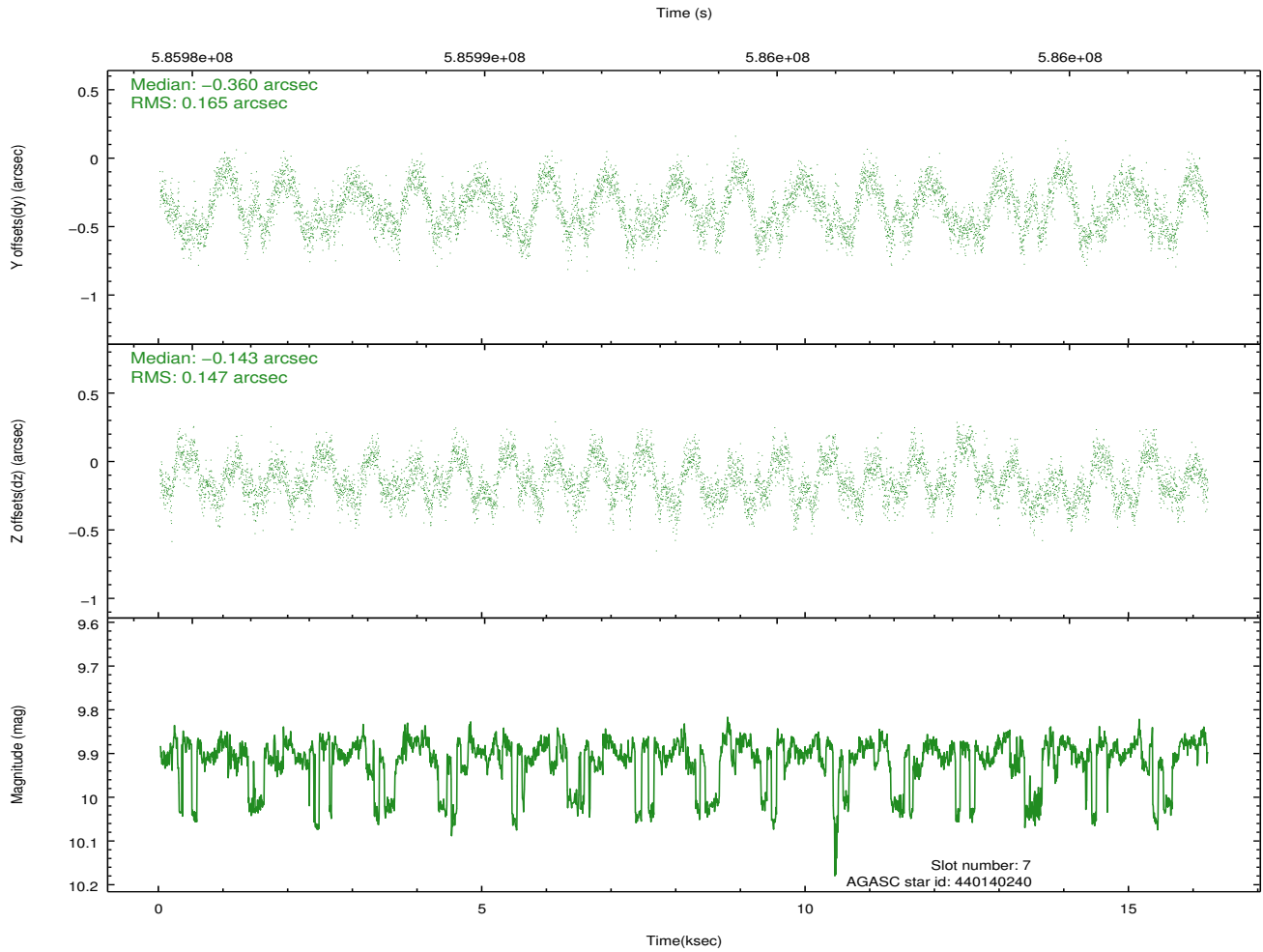
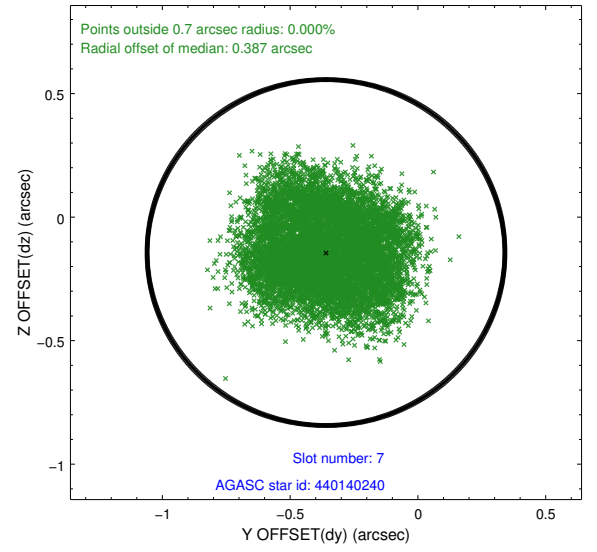
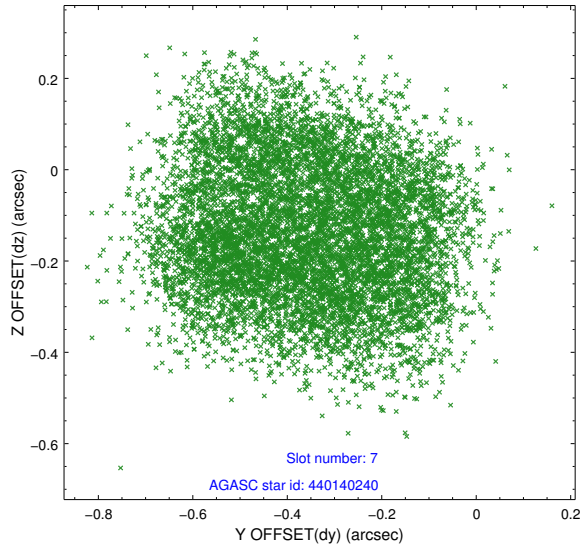
### 2.4.3 Slot 5



## 2.4.4 Slot 6

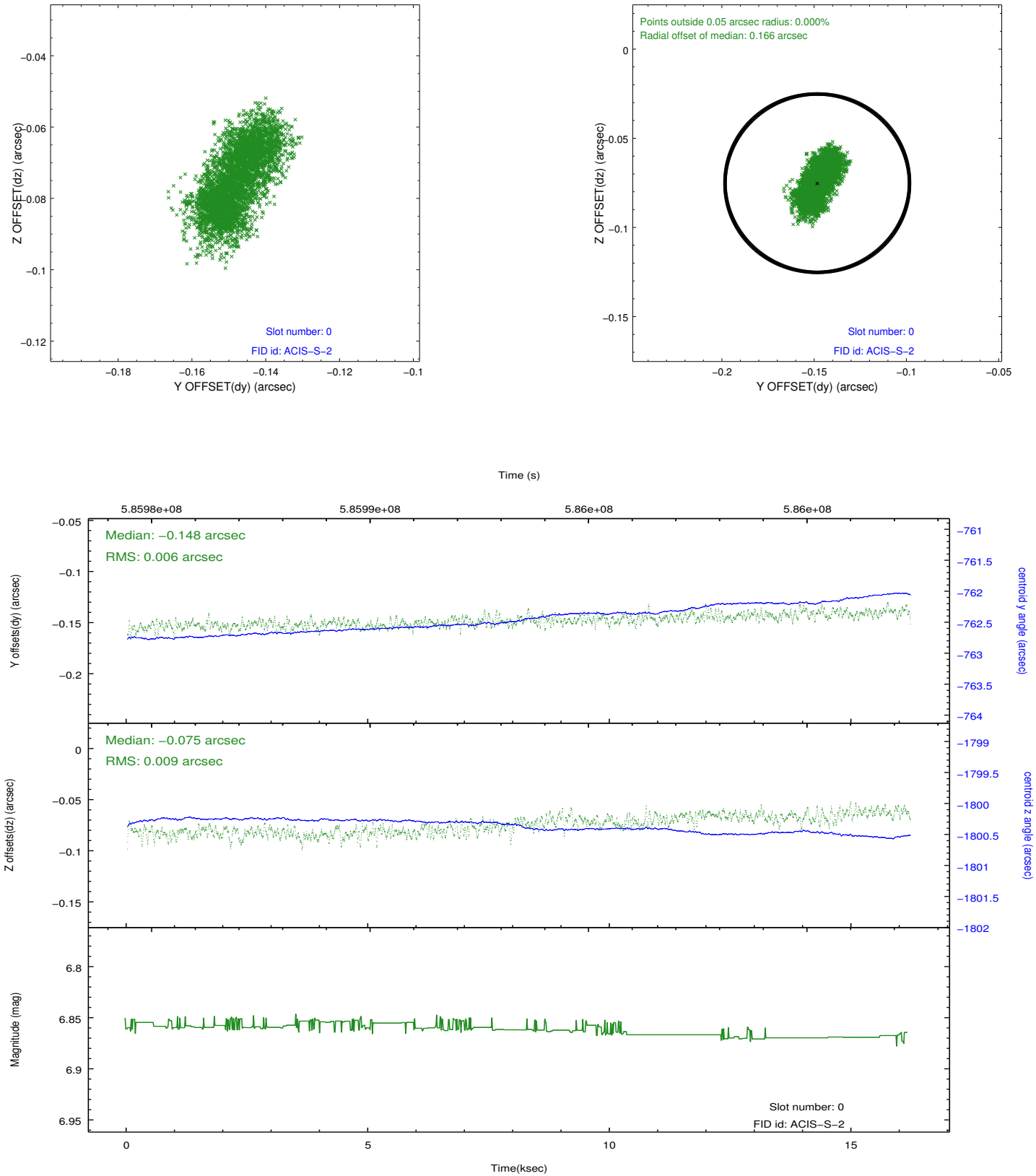


## 2.4.5 Slot 7

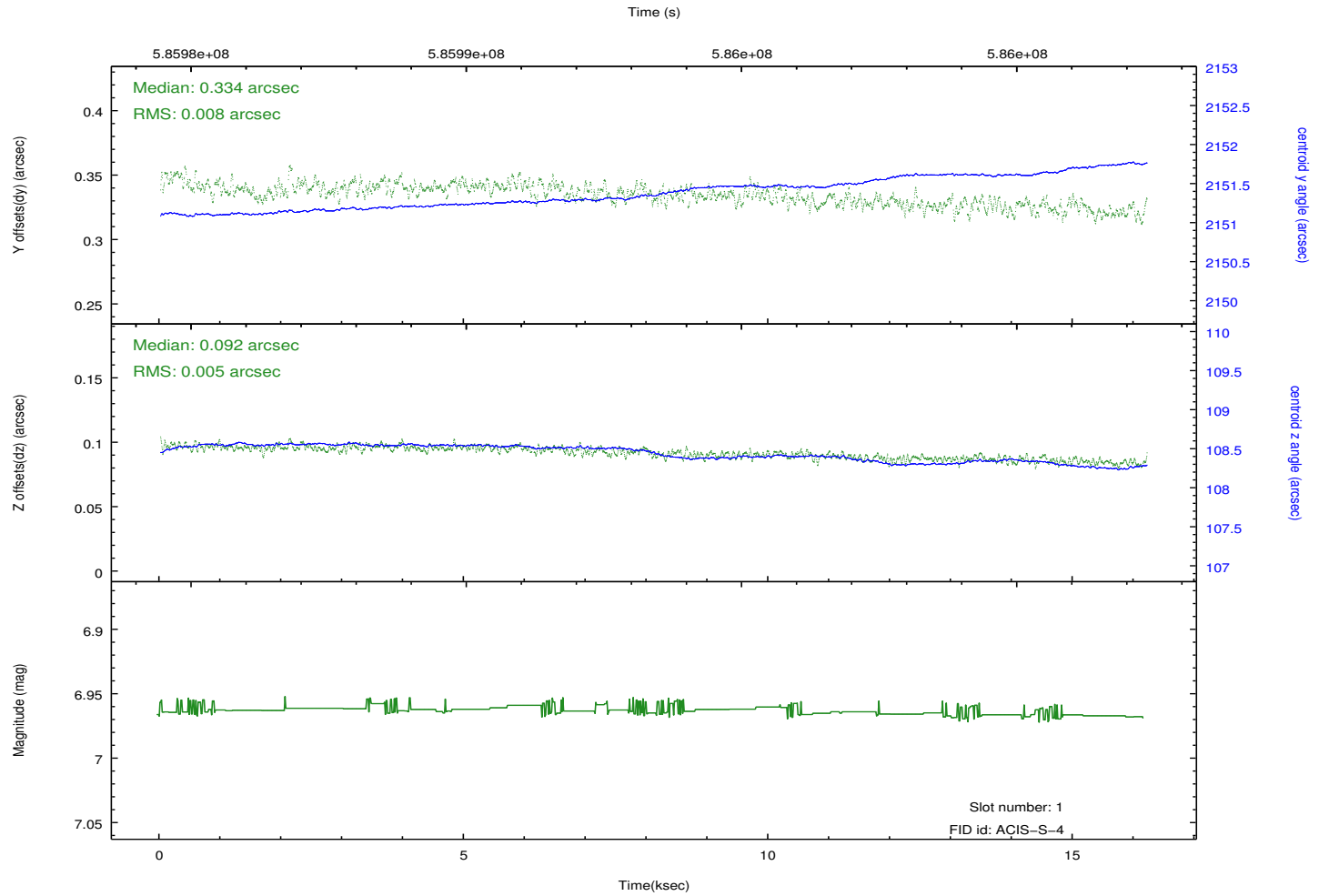
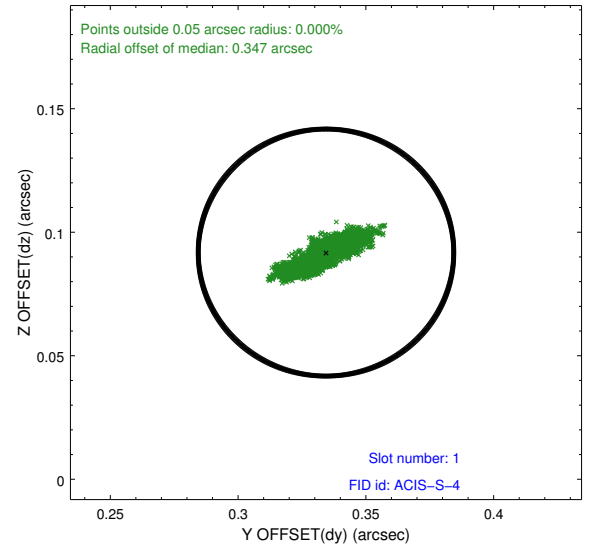
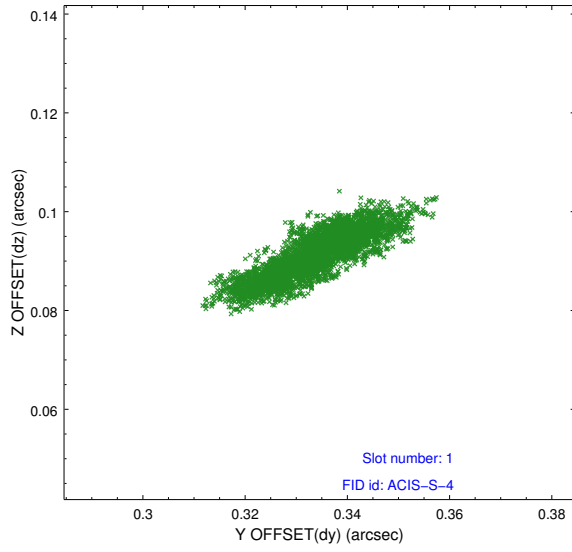


## 2.5 FID Slots

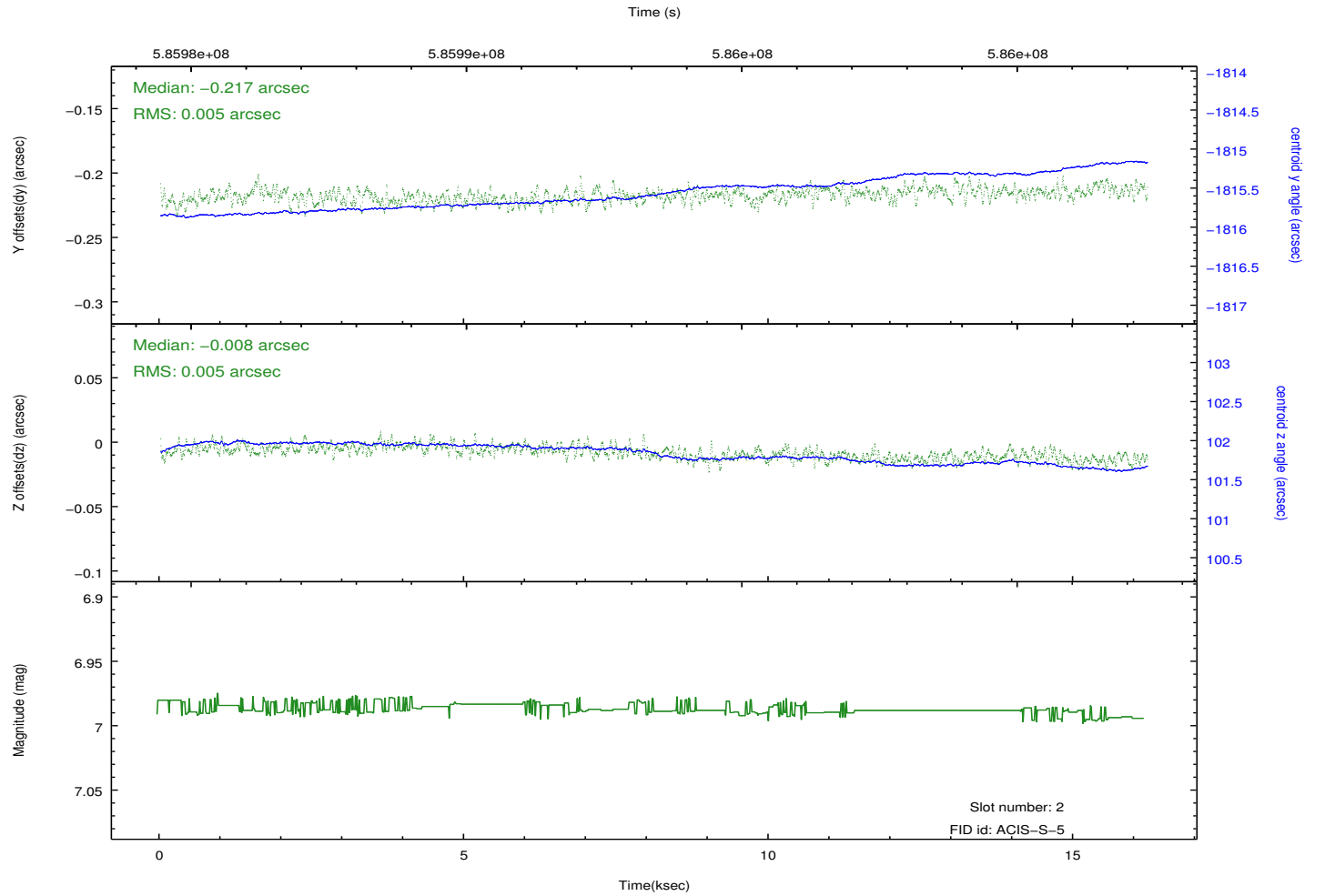
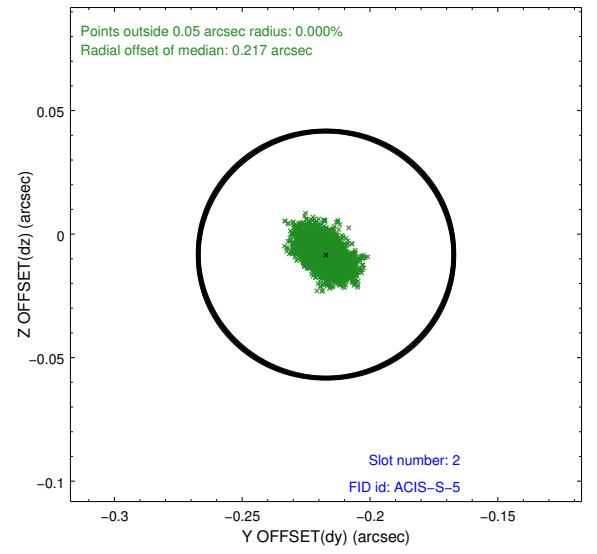
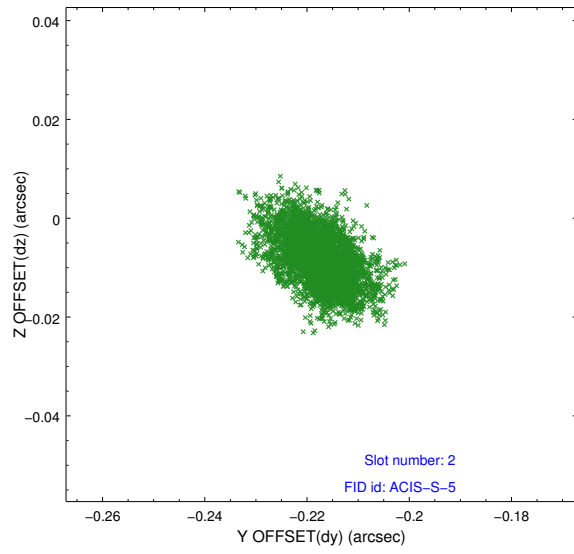
### 2.5.1 Slot 0



## 2.5.2 Slot 1

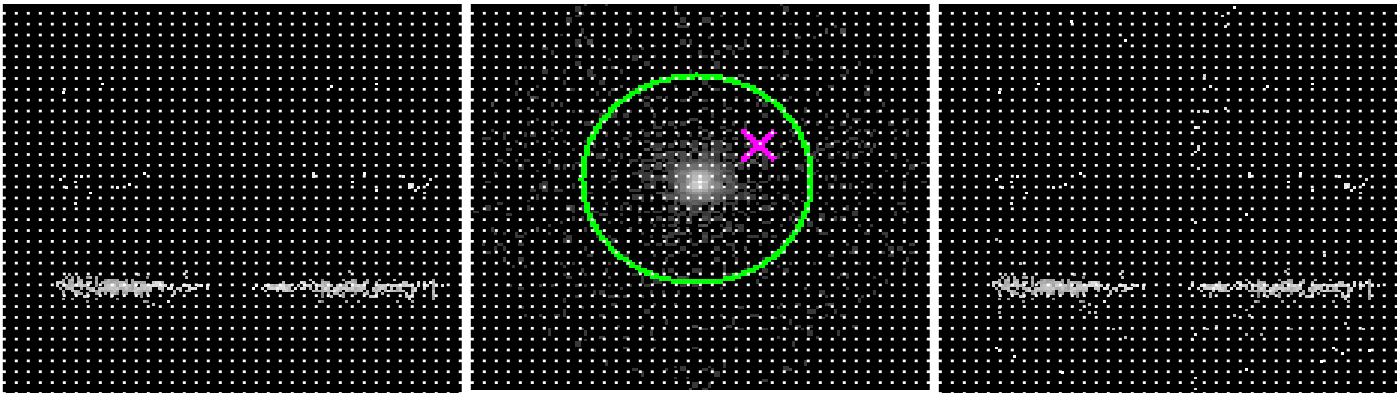


### 2.5.3 Slot 2



# 3 Gratings

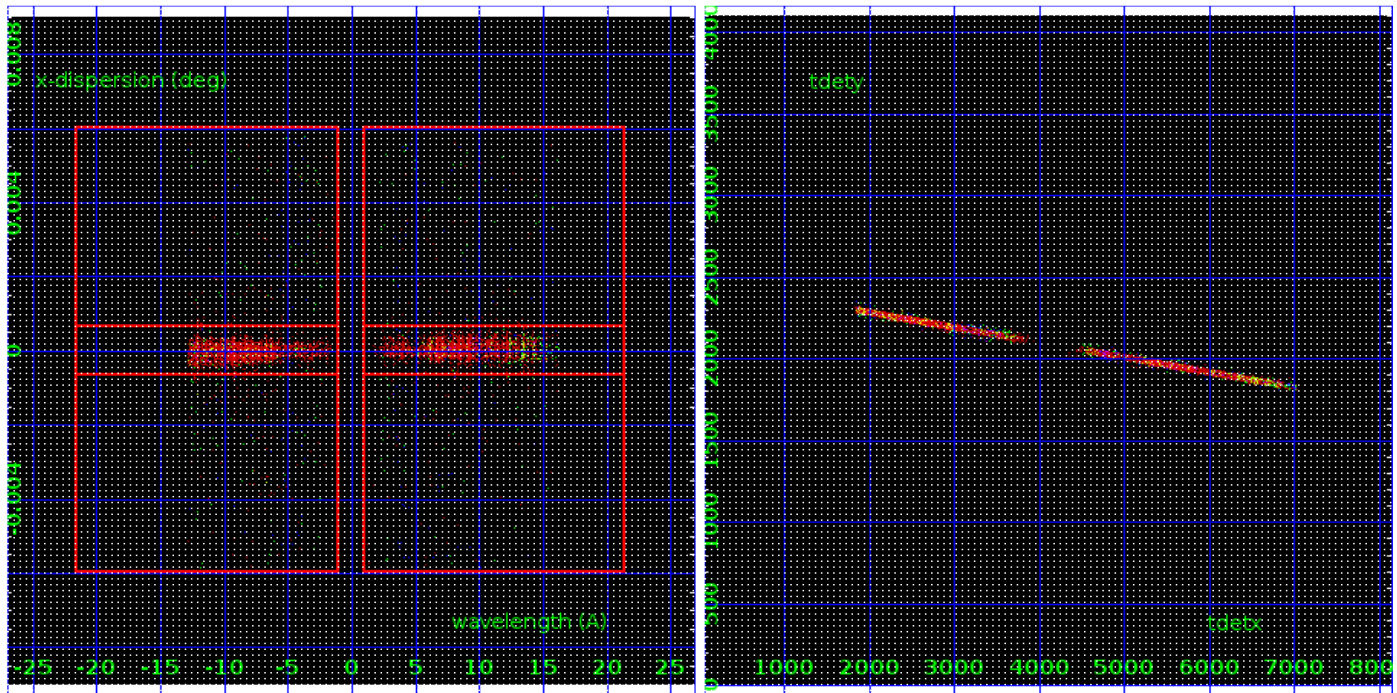
## 3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

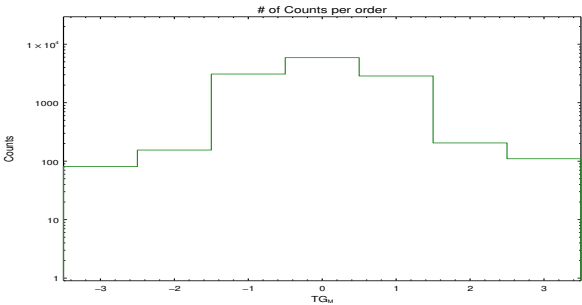
HEG Order Sort ALL

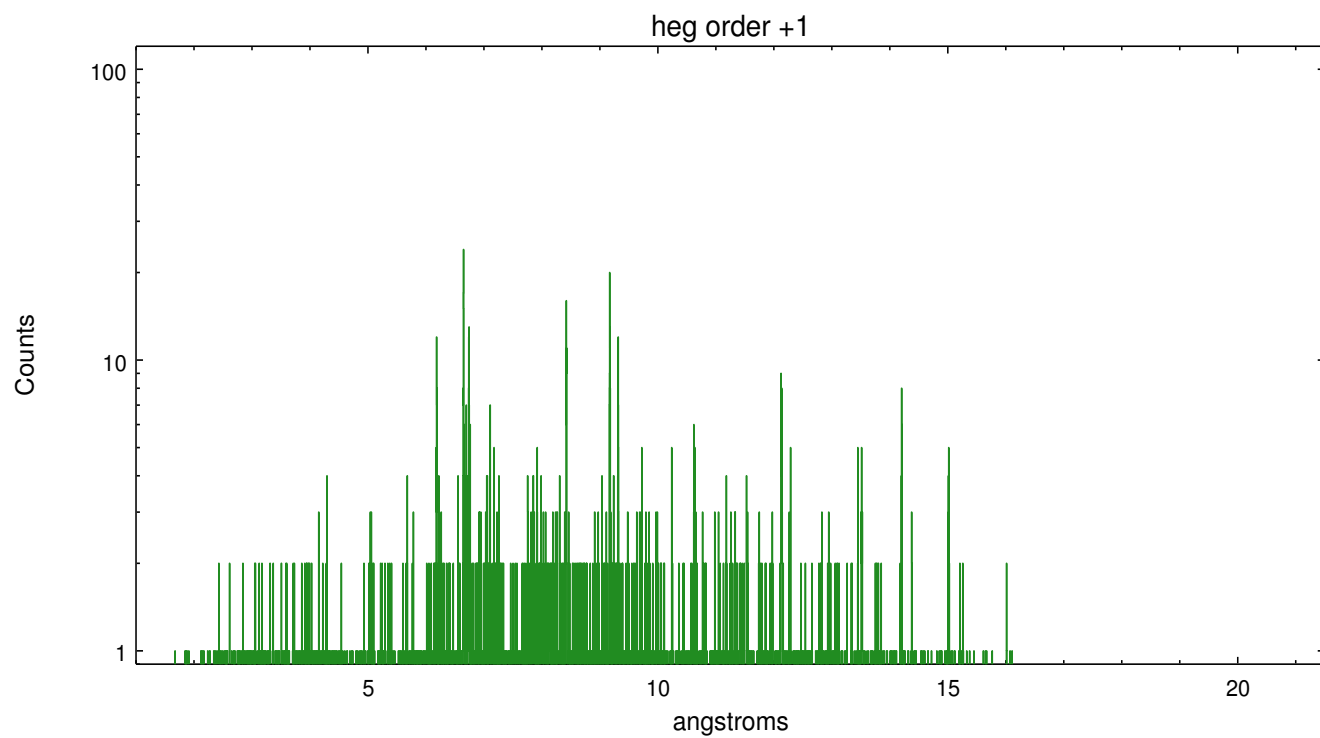
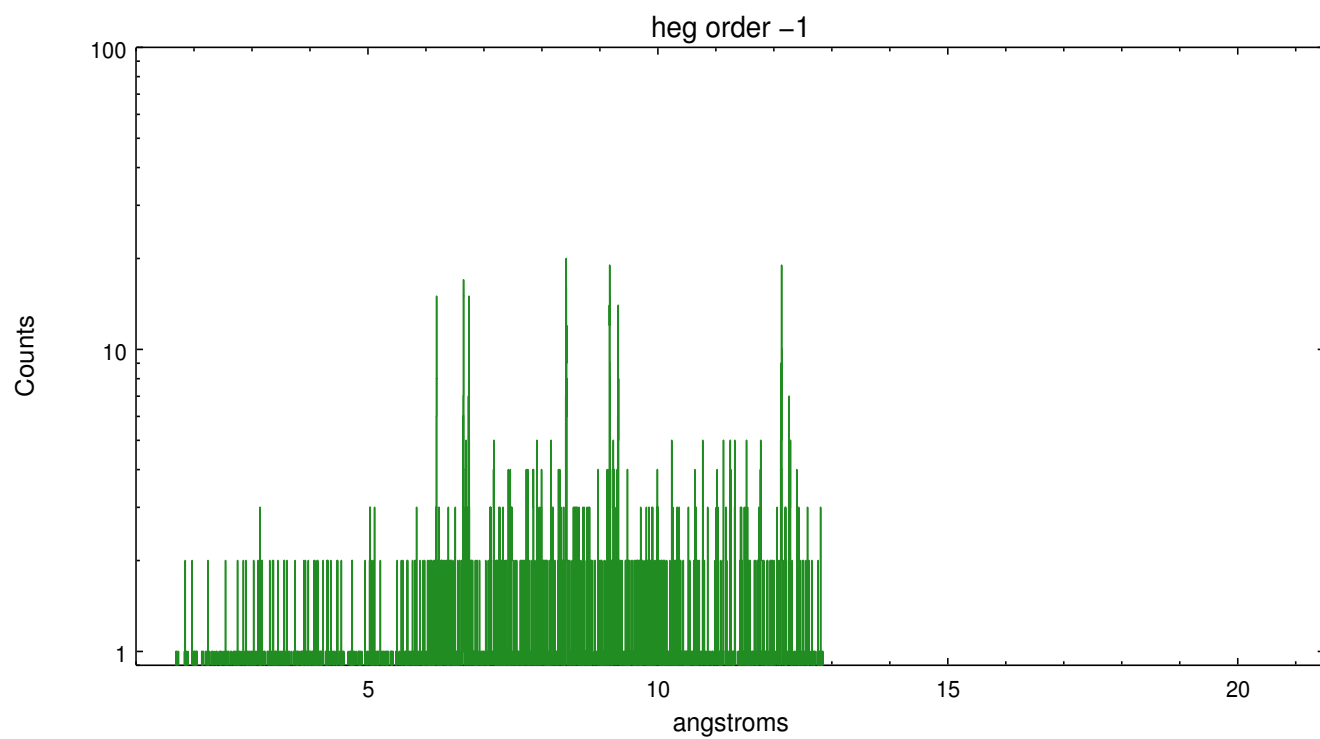


Spot Image HEG

Full Detector HEG

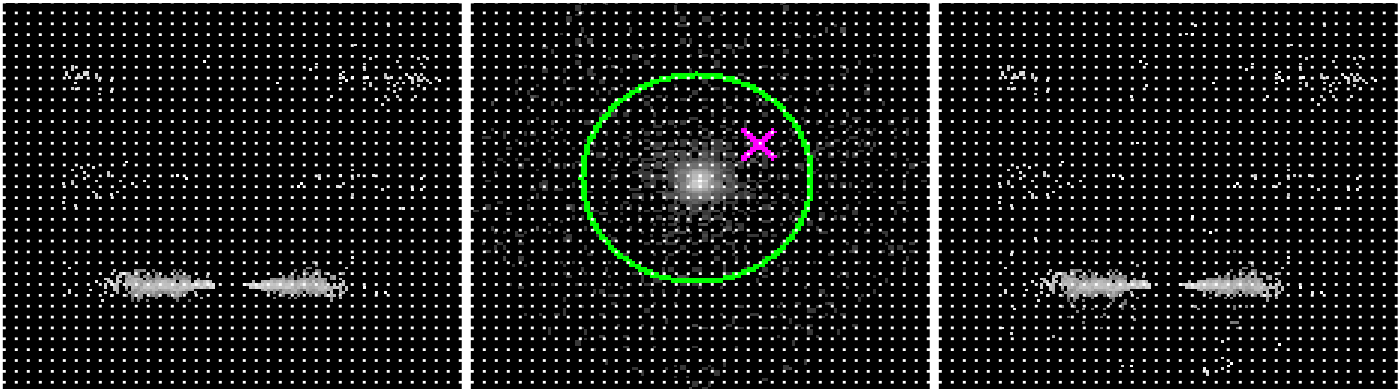
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	81	155	3092	5892	2863	205	110







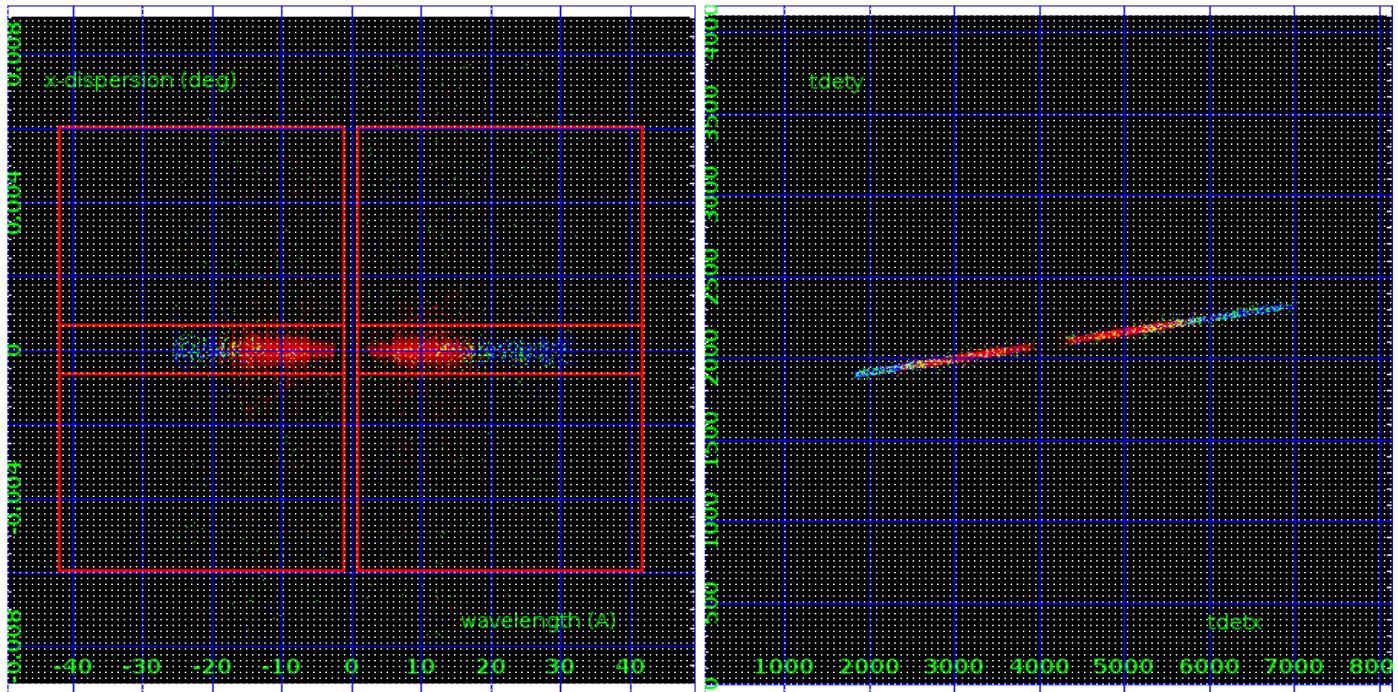
3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

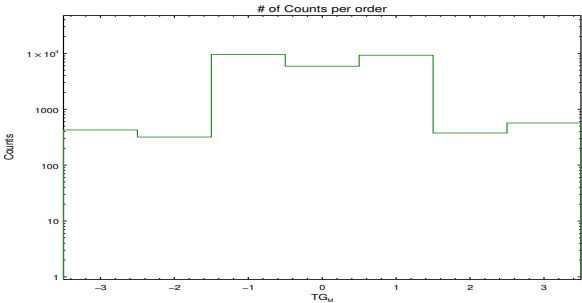
MEG Order Sort ALL

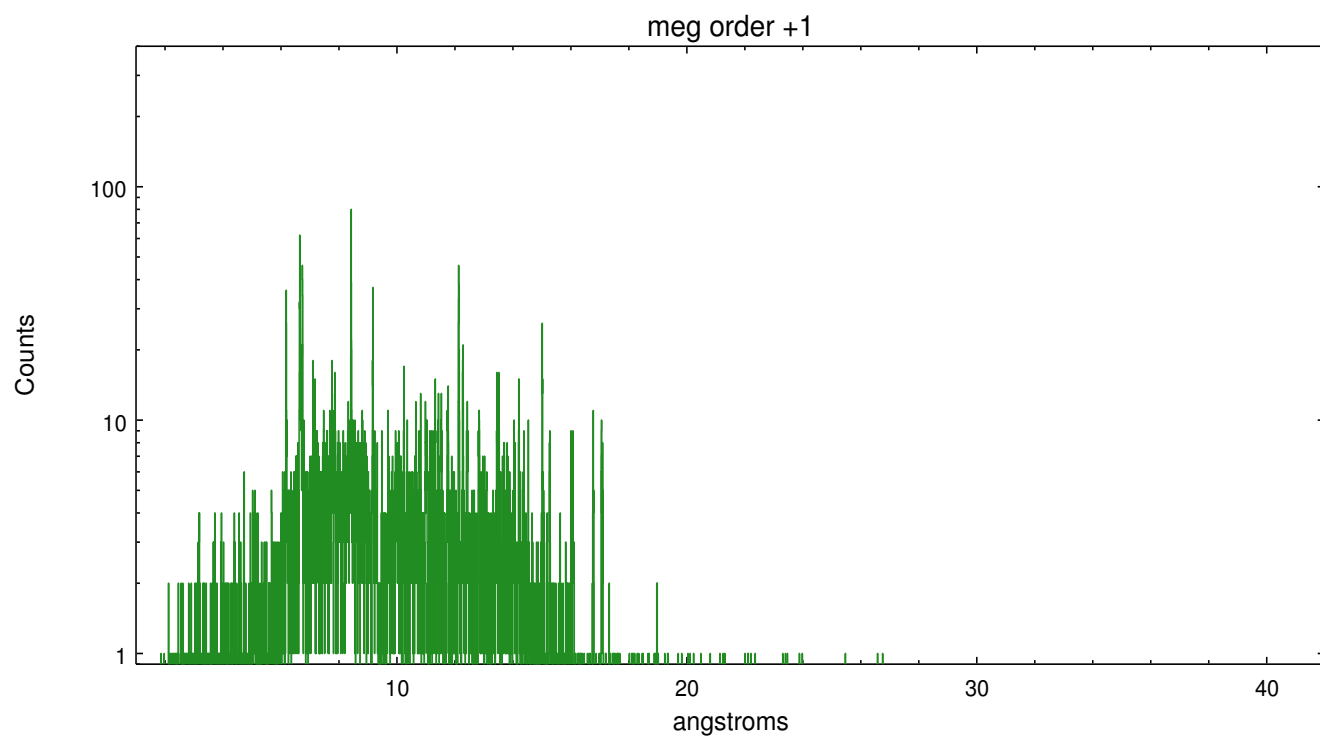
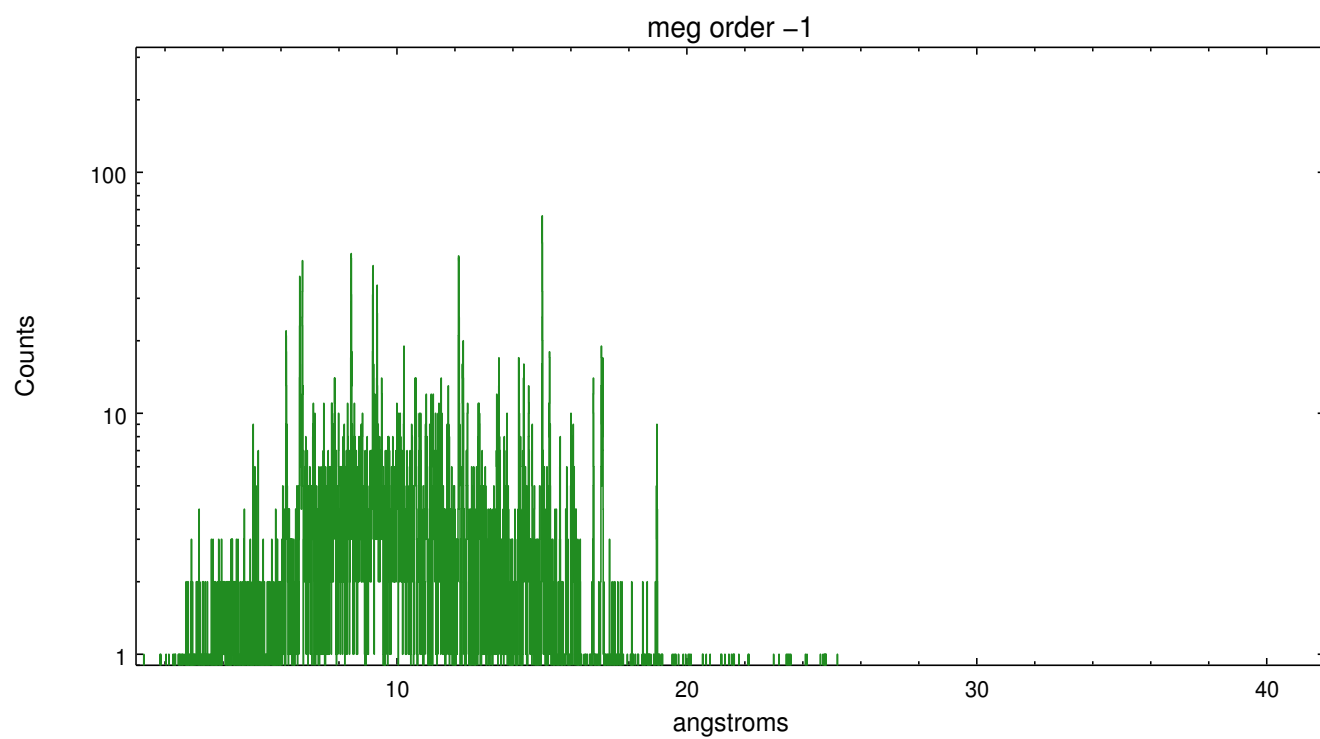


Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	426	318	9560	5892	9276	376	568





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2016.07.29
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	15.045599850416

## A.2 Comments

Zeroth order piled up. The zeroth order sky position was determined using a software tool developed by CXC called findzero, which is available in CIAO as part of the tgdetect2 tool. The tool calculates the point of intersection of the readout streak on the ACIS CCD and the meg or leg dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case.

==

A spatial region of the original bias map for CCD = 6 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small (~20 eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 6 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords: (79.22697,46.07352), (79.22513,46.06963), (79.28101,46.05691), (79.28285,46.06080).