

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 12069 - L2 Version 3  
Chandra X-Ray Center

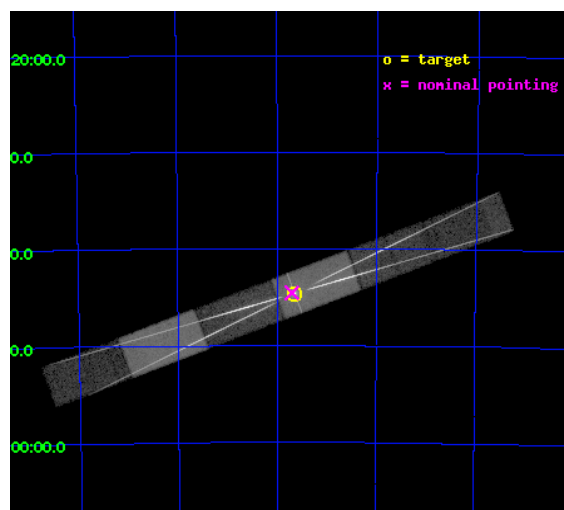
L2 Processing Date : Jun 19 2012

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# 1 Front

seq_num	401109	Sequence number
obs_id	12069	Observation id
title	Deep Chandra Observations of the Black Hole LMC X-1	Proposal title
observer	Dr. Michael Nowak	Principal investigator
object	LMC X-1	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	84.911667	Observer's specified target RA [deg]
dec_targ	-69.74325	Observer's specified target Dec [deg]
ra_nom	84.925355109085	Nominal RA [deg]
dec_nom	-69.742345124283	Nominal Dec [deg]
roll_nom	339.16946369622	Nominal Roll [deg]
revision	3	Processing version of data
ontime	18569.099869847	Sum of GTIs [s]
livetime	18131.386860003	Livetime [s]
ontime4	18565.617849469	Sum of GTIs [s]
ontime5	18569.099869847	Sum of GTIs [s]
ontime6	18569.097383738	Sum of GTIs [s]
ontime7	18569.099869847	Sum of GTIs [s]
ontime8	18569.056343734	Sum of GTIs [s]
ontime9	18569.015303731	Sum of GTIs [s]
l2events	470658	Number of level 2 events

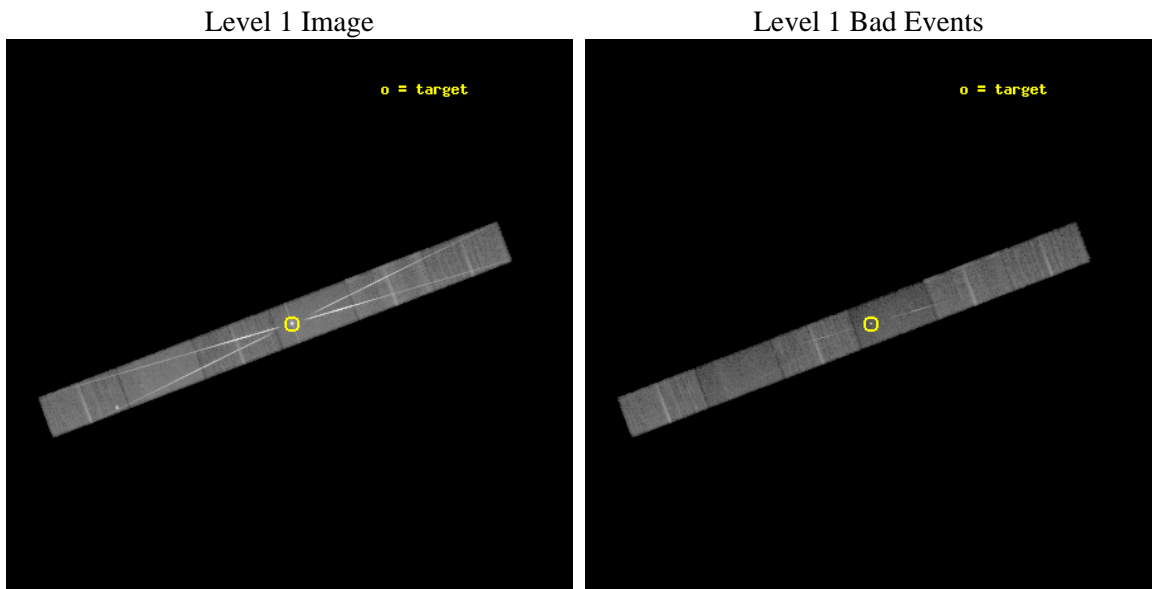




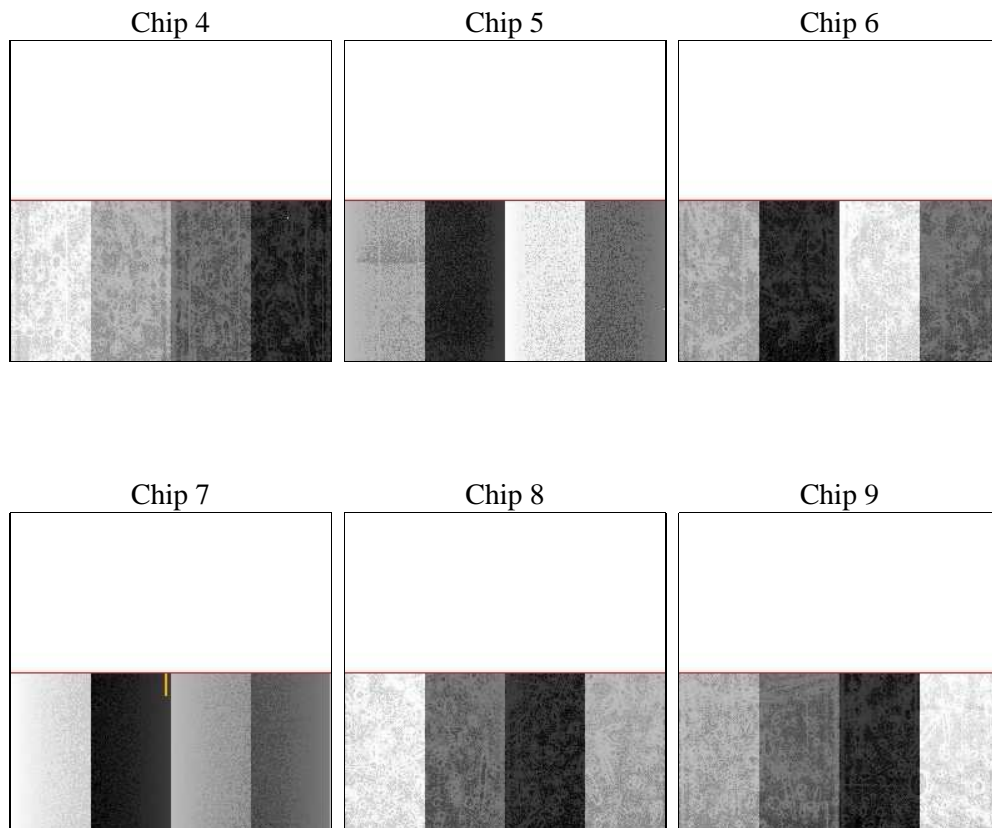
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	18500.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	18569.099869847	Sum of GTIs [s]
caldsver	4.4.10	&#160	ontime4	18565.617849469	Sum of GTIs [s]
date	2012-06-19T07:54:21	Date and time of file creation	ontime5	18569.099869847	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	18569.097383738	Sum of GTIs [s]
			ontime7	18569.099869847	Sum of GTIs [s]
			ontime8	18569.056343734	Sum of GTIs [s]
			ontime9	18569.015303731	Sum of GTIs [s]
			l1events	968546	Number of level 1 events

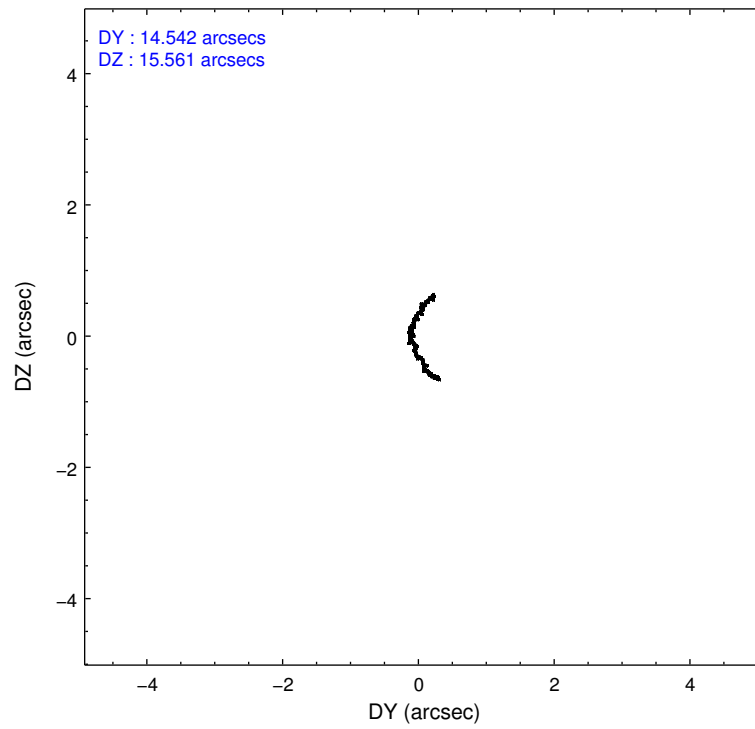
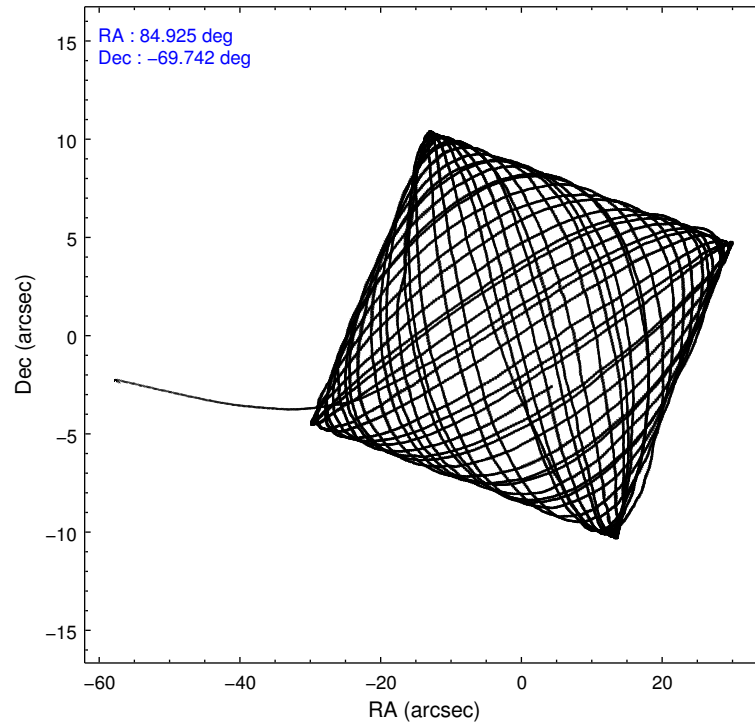
### 2.1.4 Events

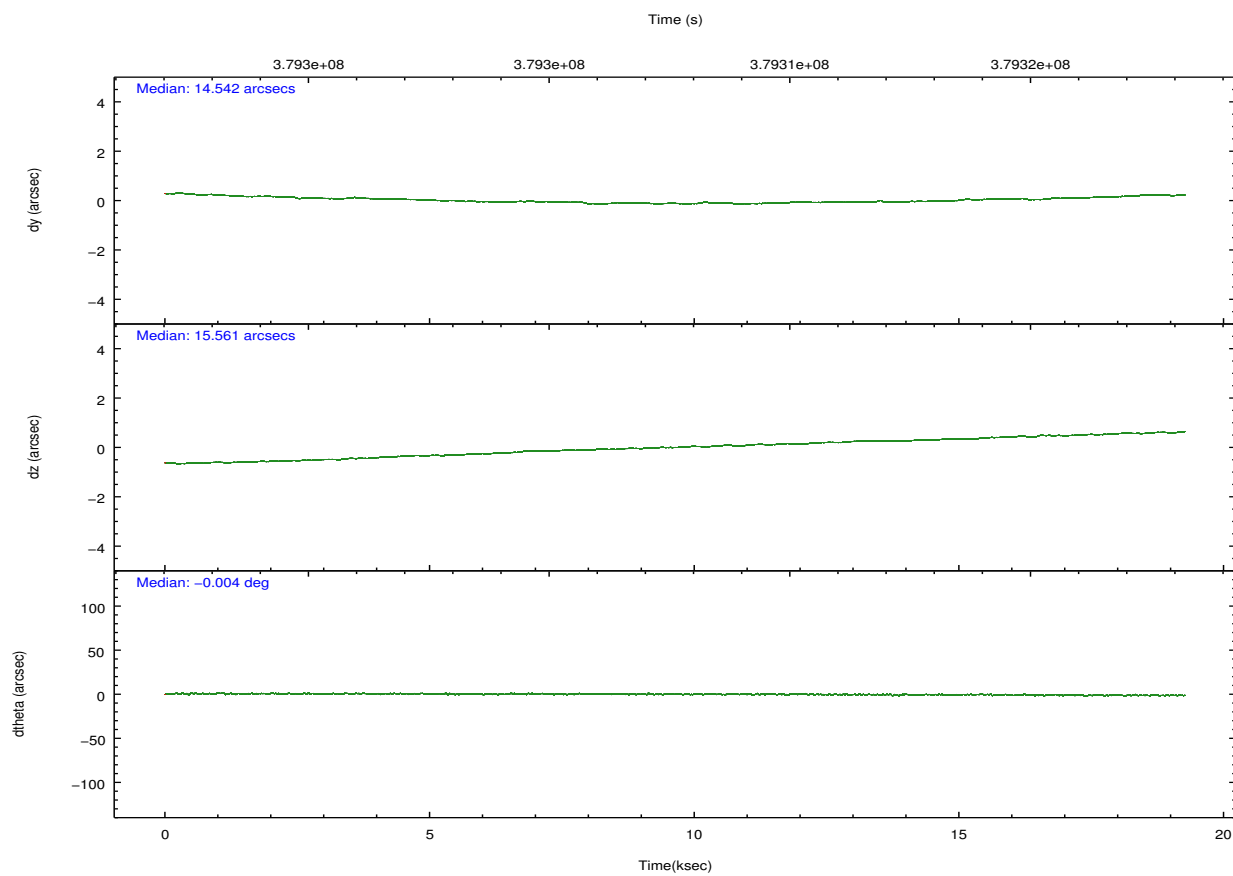
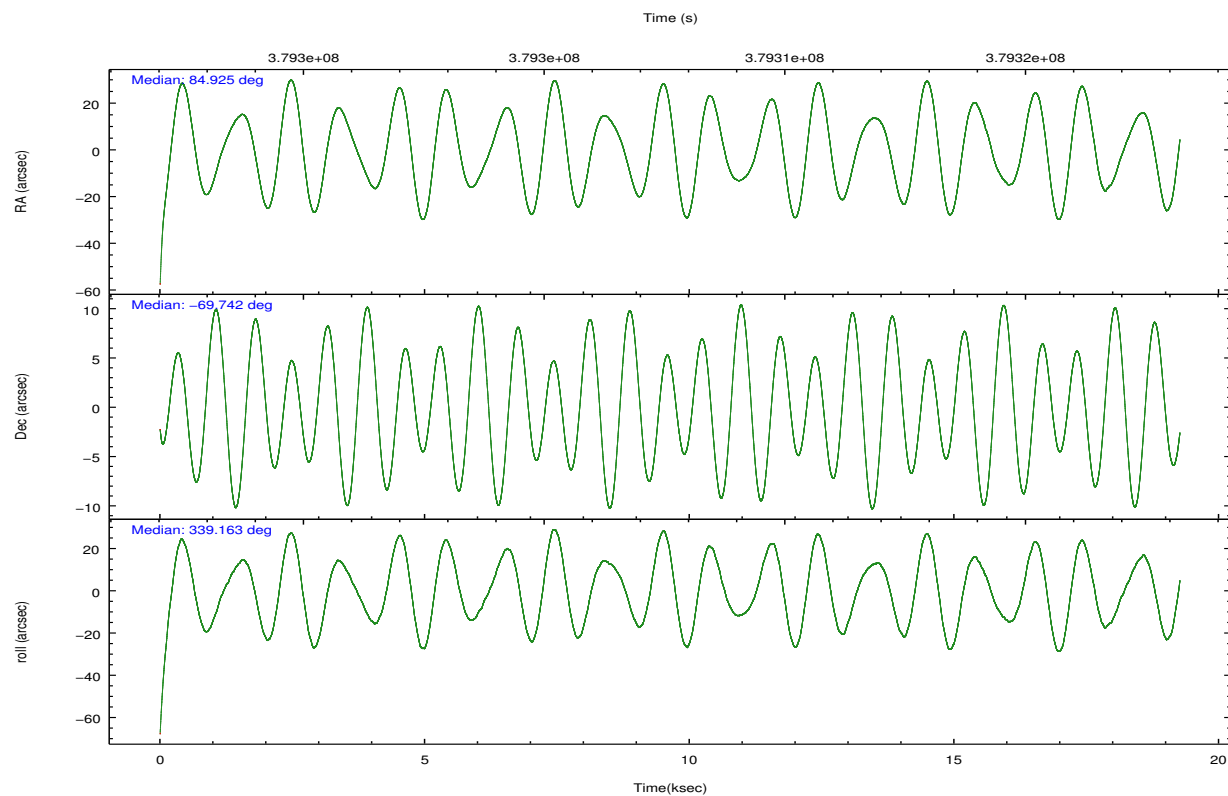
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	110736	146453	216371	229099	169260	96627	grade 0 events	10908	15872	100650	32569	52091	11550
rejected events	92339	58704	81931	55839	86194	76429		9%	10%	46%	14%	30%	11%
rejected %	83%	40%	37%	24%	50%	79%	grade 1 events	124	240	875	605	311	88
								0%	0%	0%	0%	0%	0%
							grade 2 events	2971	25187	16604	41992	12001	3199
								2%	17%	7%	18%	7%	3%
							grade 3 events	1386	6225	5938	18860	5147	1644
								1%	4%	2%	8%	3%	1%
							grade 4 events	1299	6018	5716	18932	4645	1560
								1%	4%	2%	8%	2%	1%
							grade 5 events	3311	10293	4002	12079	4967	3617
								2%	7%	1%	5%	2%	3%
							grade 6 events	1835	34453	5547	60925	9197	2246
								1%	23%	2%	26%	5%	2%
							grade 7 events	88902	48165	77039	43137	80901	72723
								80%	32%	35%	18%	47%	75%

## 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	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	84.847622	84.92535510908527	CCD I2 on	N	N
[deg] Pointing Dec	-69.747052	-69.74234512428329	CCD I3 on	N	N
[deg] Pointing Roll	338.939907	339.1694636962239	CCD S0 on	O1	Y
[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	-183.992523	-183.985022191653	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-6.14	-6.147500391354811	CCD S4 on	Y	Y
[s] Observation start time (MET)	379298756.184000	379297107.47984	CCD S5 on	Y	Y
Observation start date	2010-01-08T00:44:50	2010-01-08T00:18:27	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	379317256.184000	379318035.93089	On-chip summing requested	N	N
Observation end date	2010-01-08T05:53:10	2010-01-08T06:07:15	Subarray requested	CUSTOM	1/2
Read mode	TIMED	TIMED	Subarray start row	1	1
			Subarray row count	512	512
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	1.7

## 2.3 Aspect



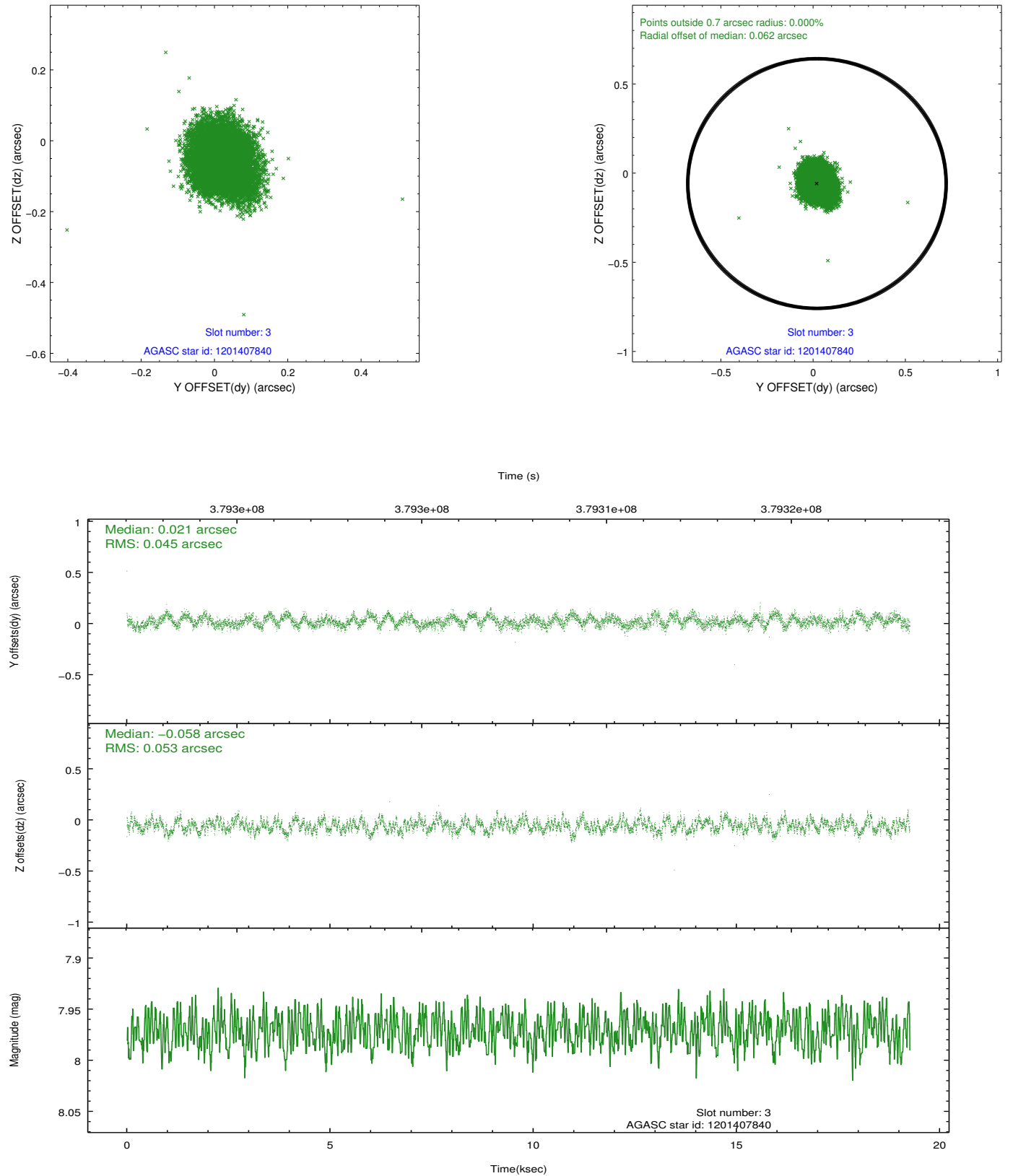


### Slot Statistics

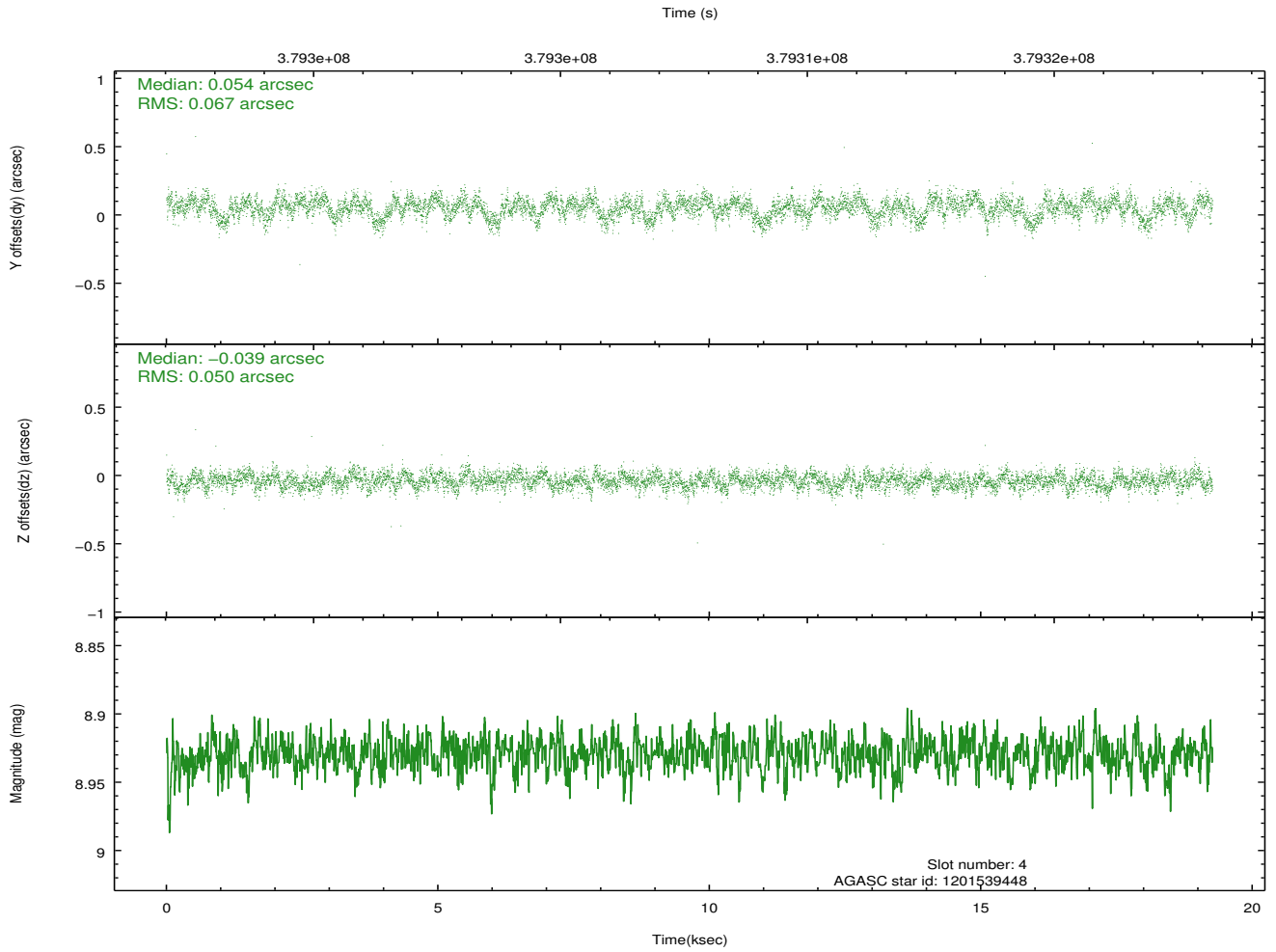
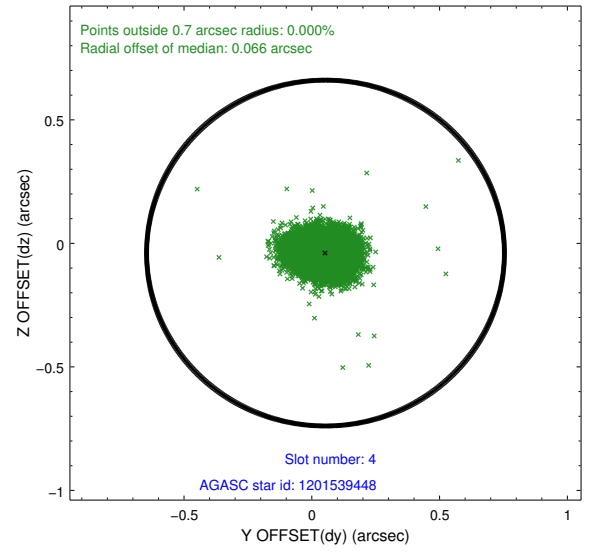
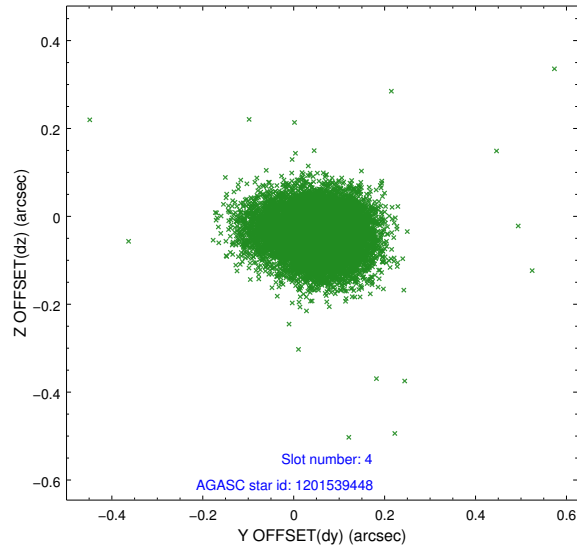
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-1	7.00	4700	0.088	0.118	0.014	0.026	0.000000	0.000000	928.99	-1859.18
1	FID	ACIS-S-4	6.98	4700	0.120	-0.119	0.012	0.020	0.000000	0.000000	2146.58	44.48
2	FID	ACIS-S-5	7.04	4699	-0.235	0.014	0.008	0.013	0.000000	0.000000	-1819.91	38.49
3	GUIDE	1201407840	7.97	9393	0.021	-0.058	0.074	0.116	83.696303	-70.172201	-756.38	-1945.94
4	GUIDE	1201539448	8.93	9388	0.054	-0.039	0.088	0.142	85.635707	-70.382152	1713.52	-1796.68
5	GUIDE	1201541752	7.37	9397	-0.115	0.005	0.061	0.096	85.373891	-70.033762	976.30	-733.14
6	GUIDE	1201542672	8.20	9396	0.114	-0.021	0.075	0.119	84.492488	-69.957531	-135.42	-863.81
7	GUIDE	1201540760	8.55	9391	-0.070	0.121	0.077	0.126	84.403691	-70.419249	371.28	-2452.06

## 2.4 Star Slots

### 2.4.1 Slot 3

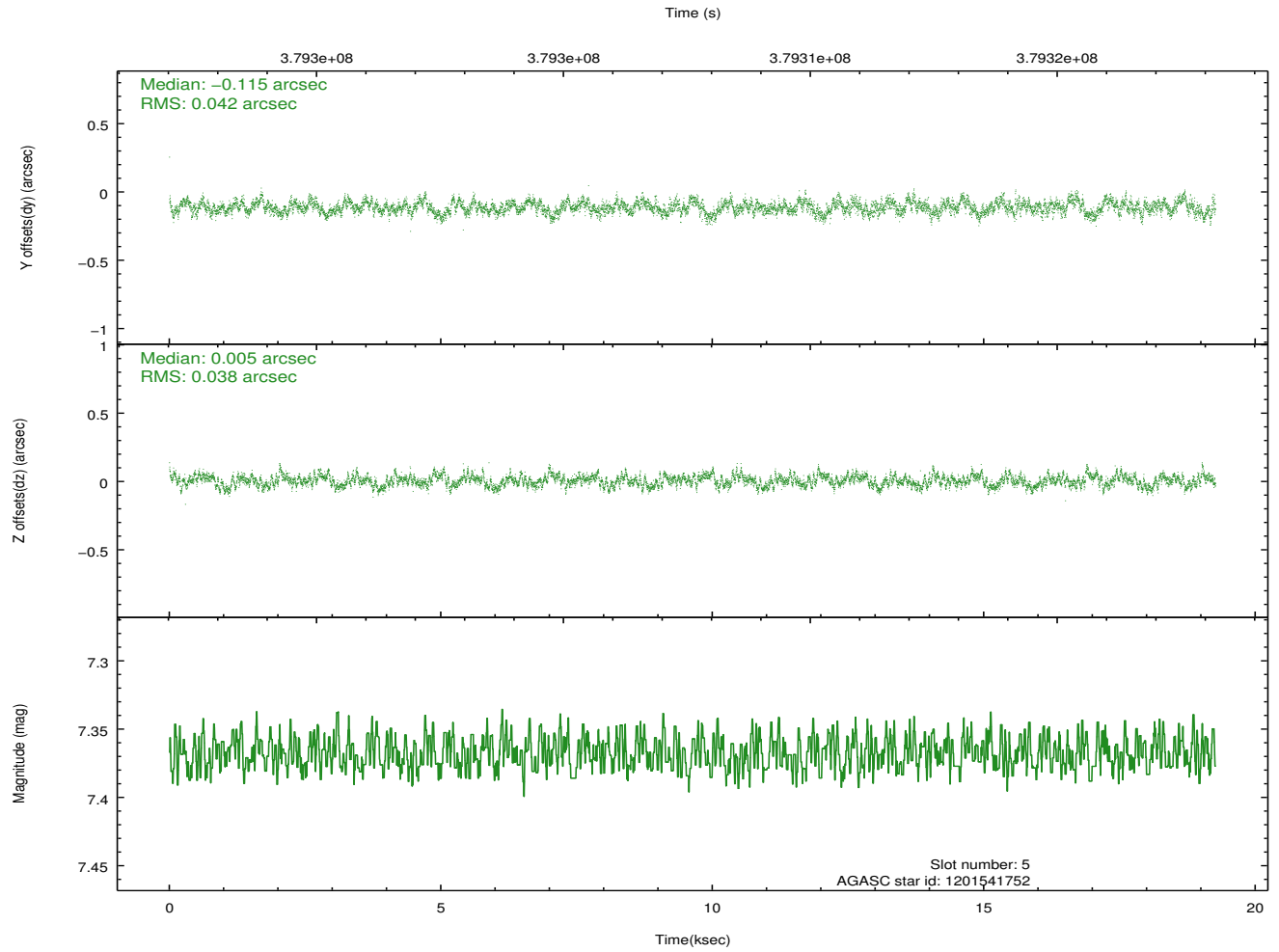
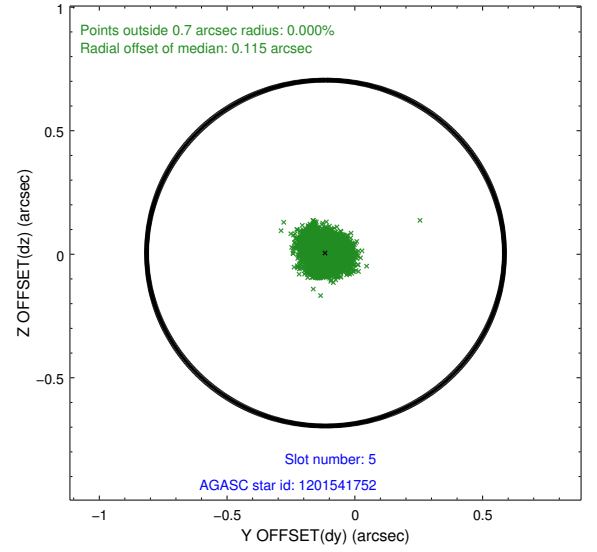
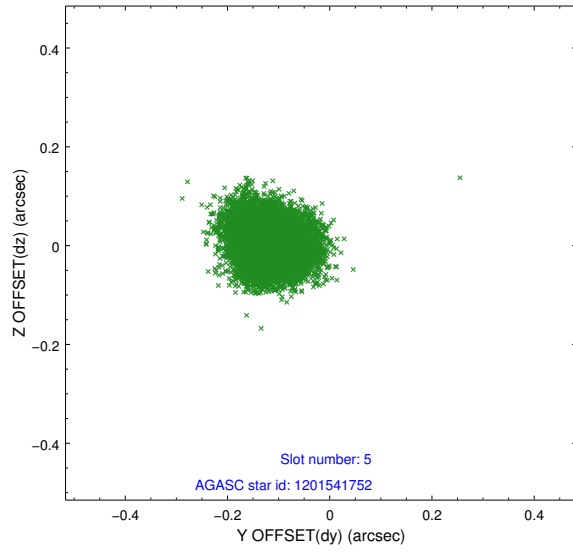


## 2.4.2 Slot 4

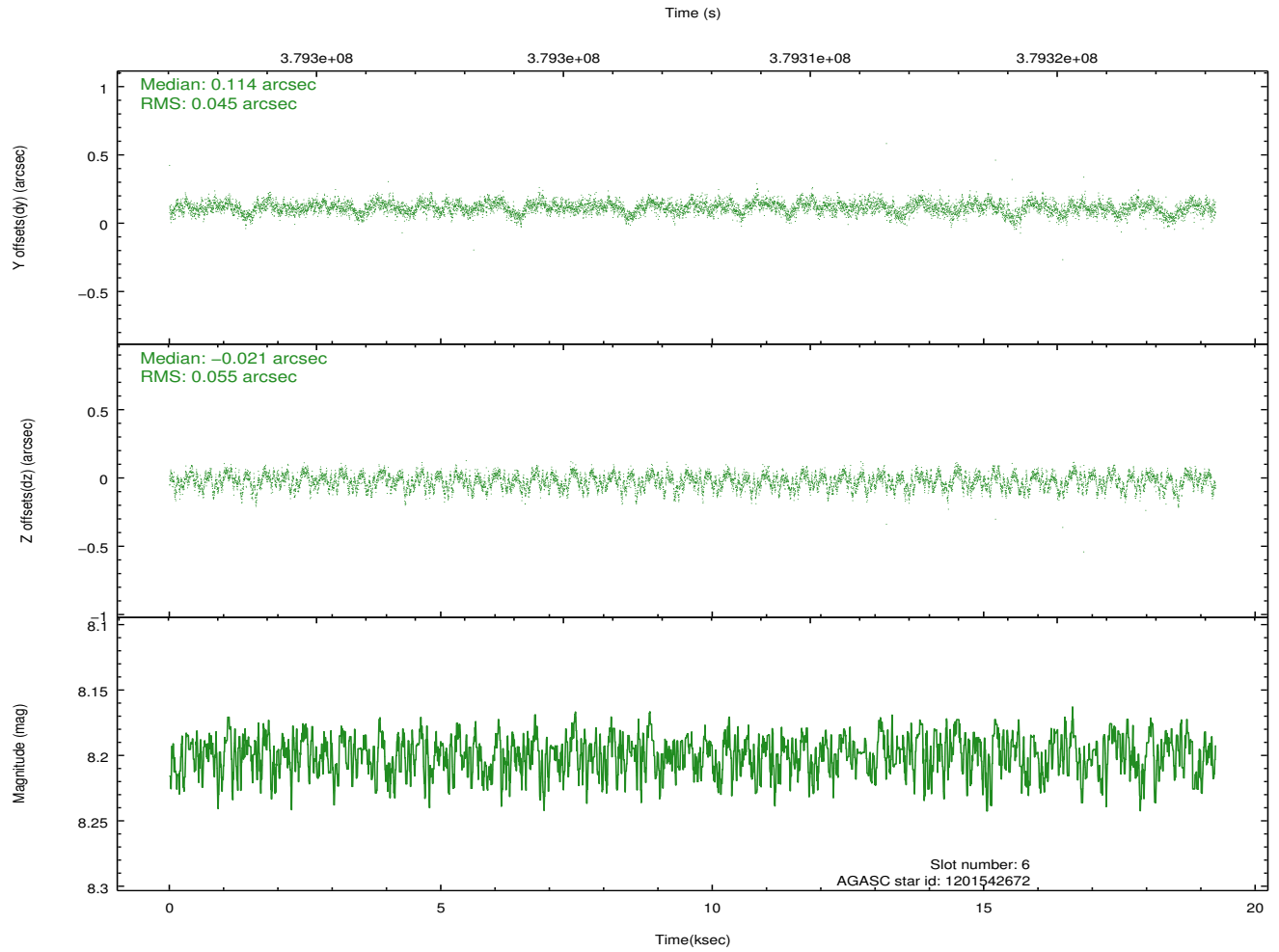
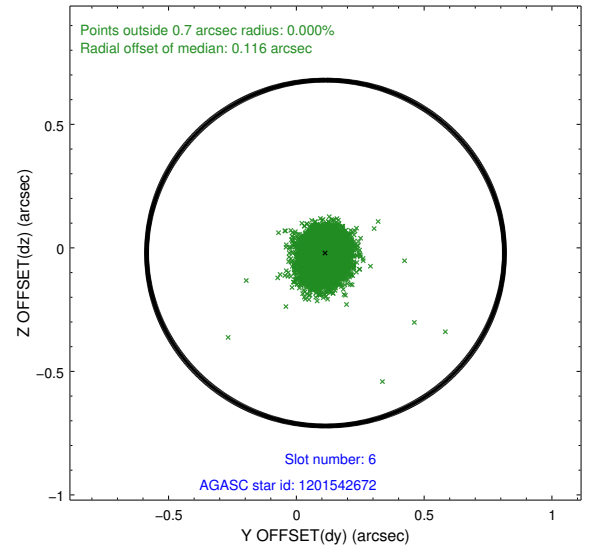
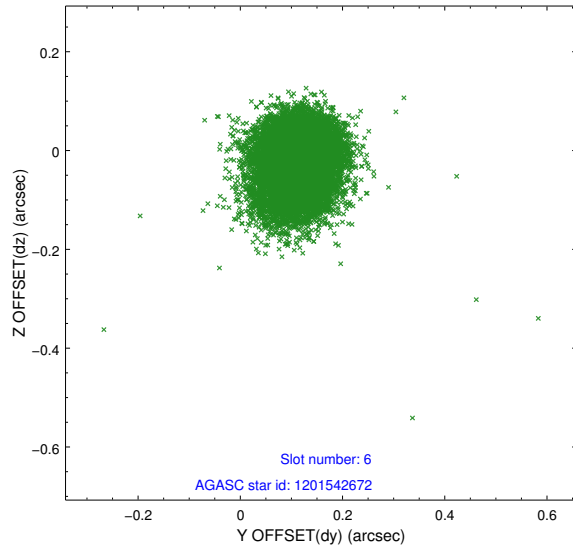




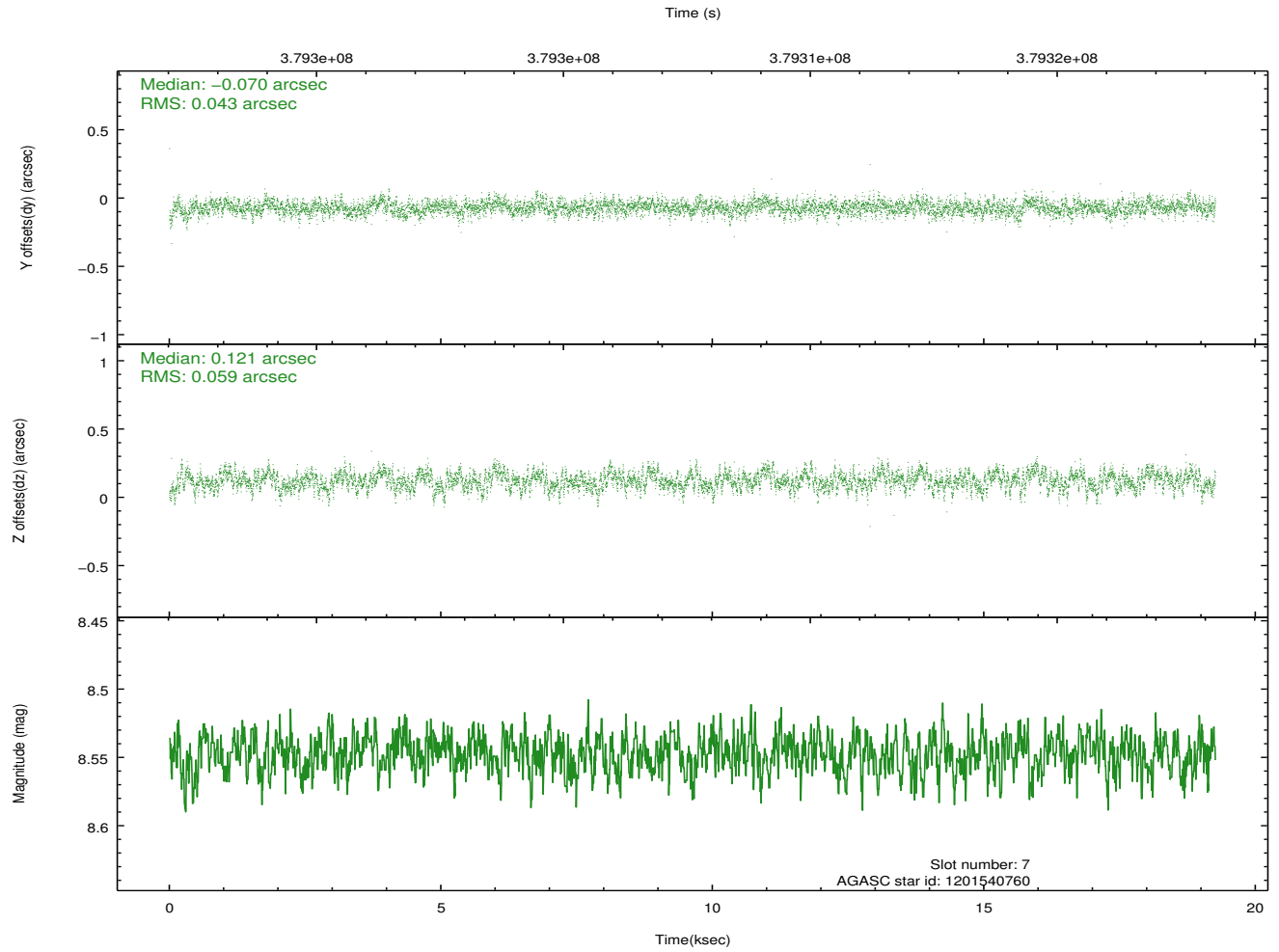
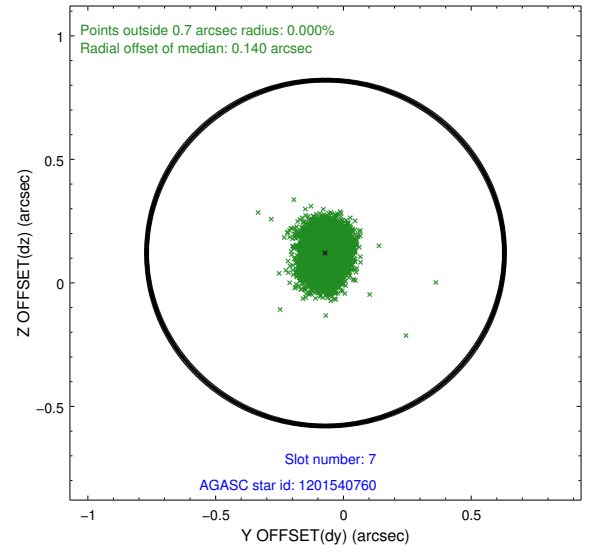
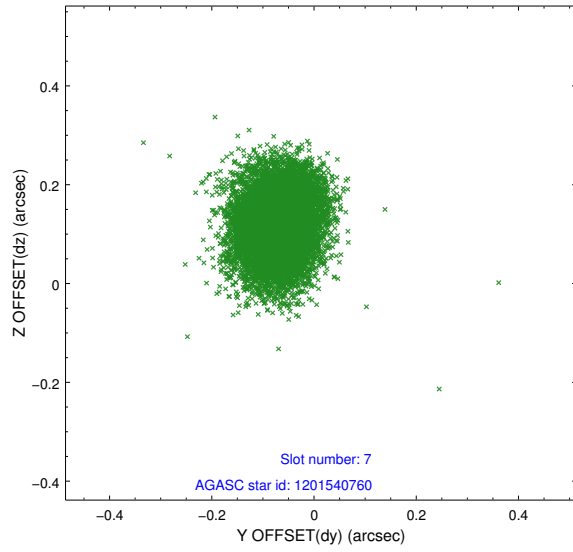
### 2.4.3 Slot 5



## 2.4.4 Slot 6

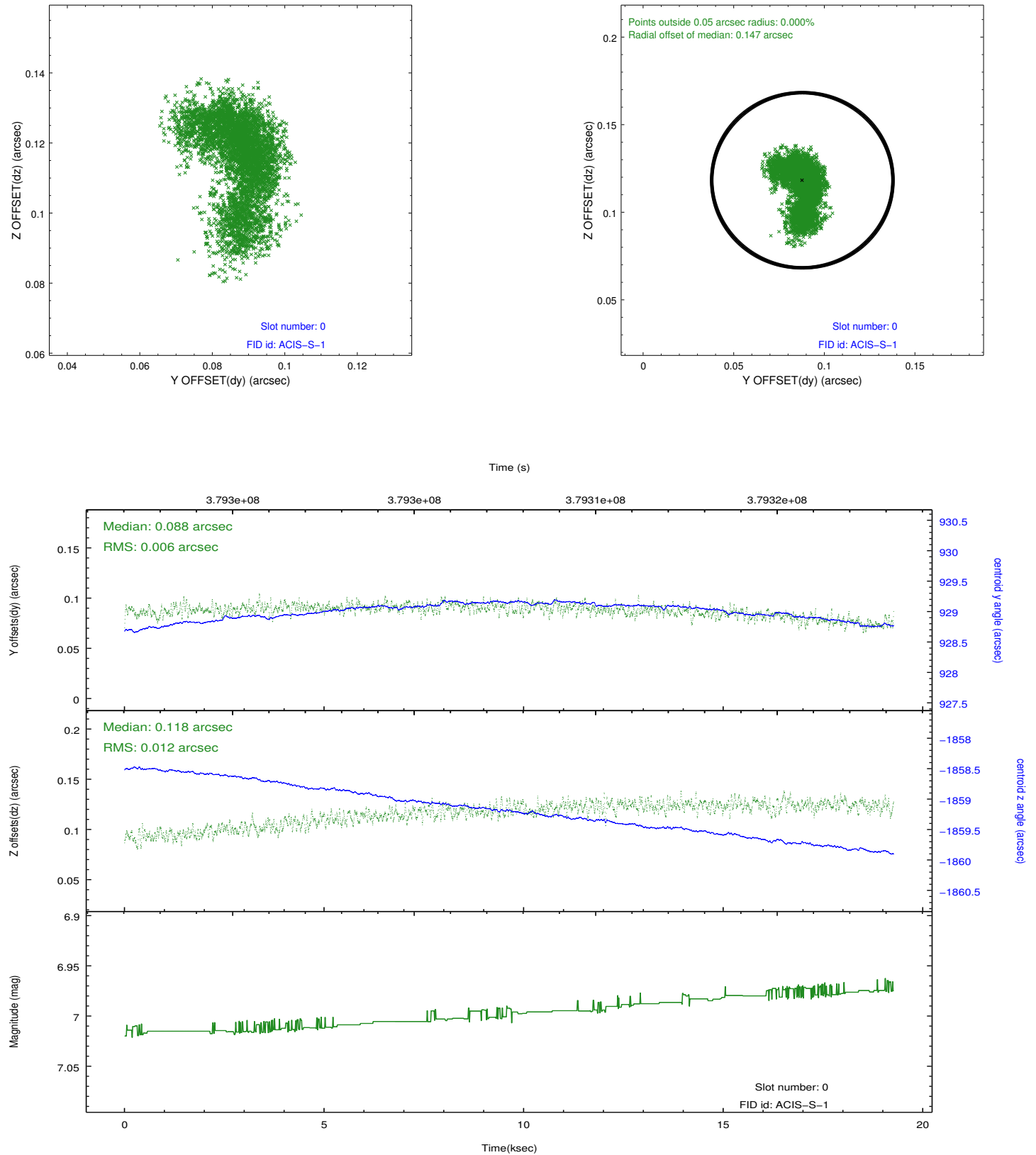


## 2.4.5 Slot 7

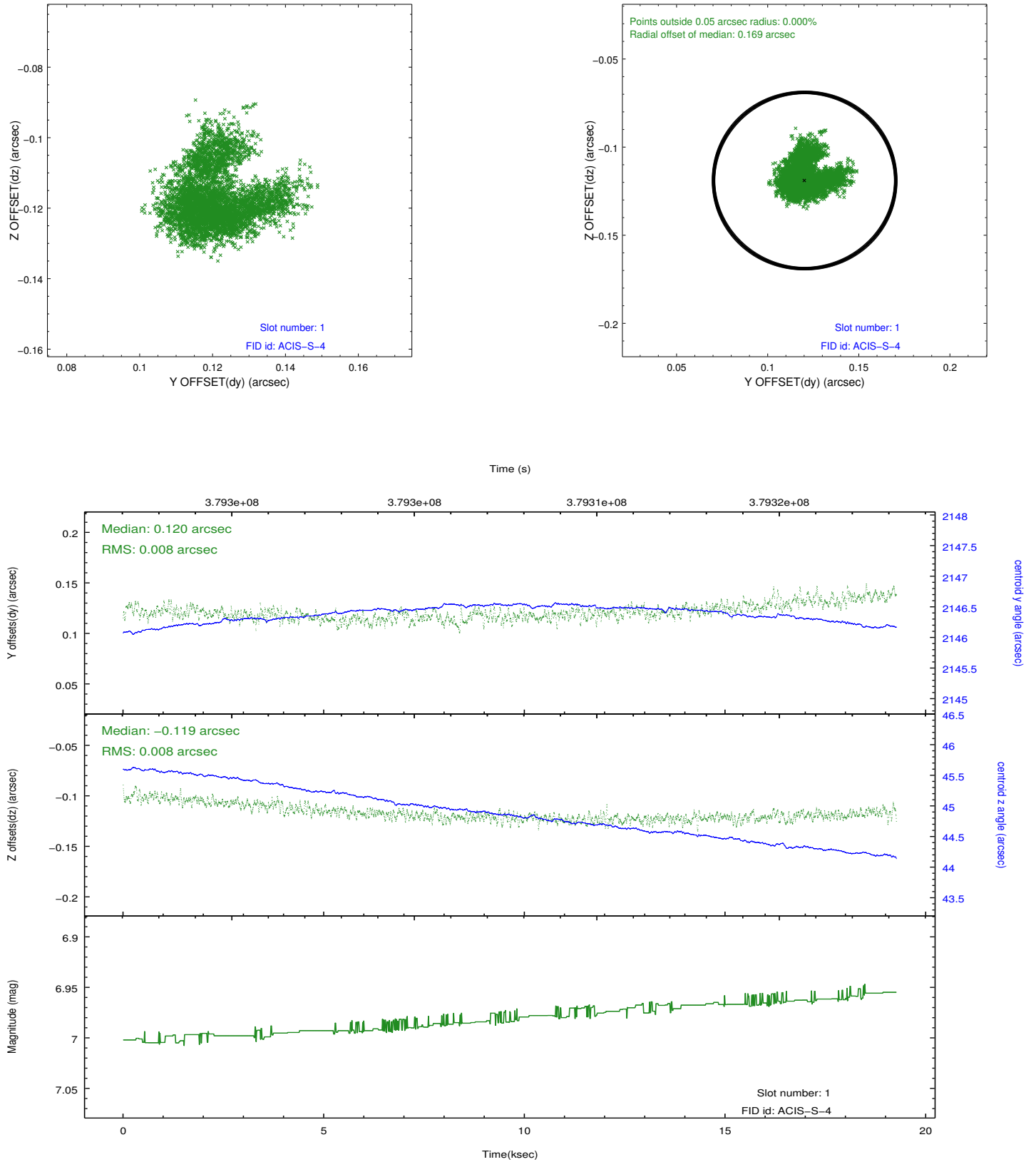


## 2.5 FID Slots

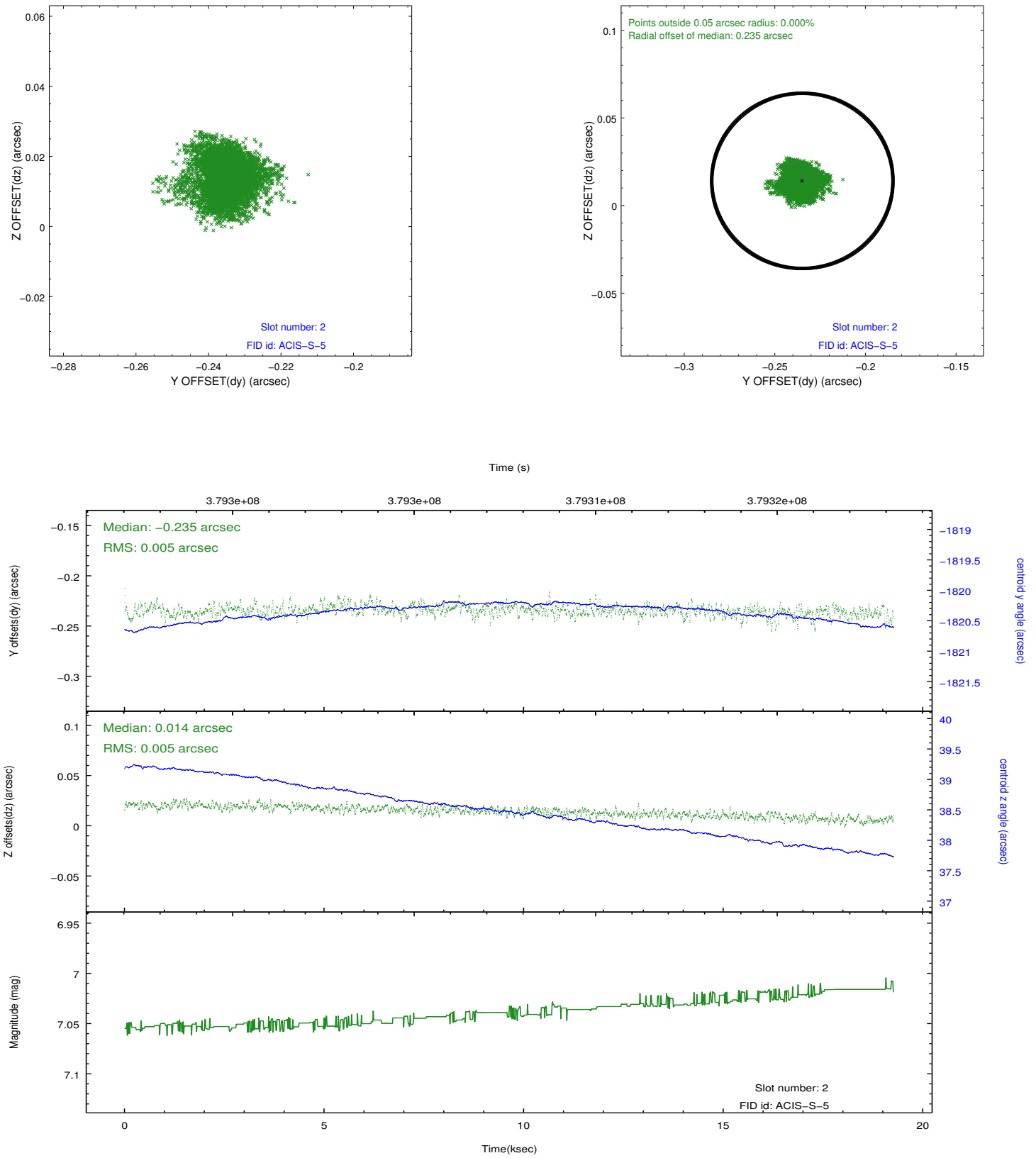
### 2.5.1 Slot 0



## 2.5.2 Slot 1

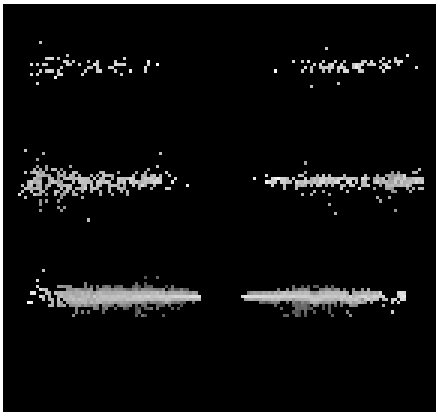


### 2.5.3 Slot 2

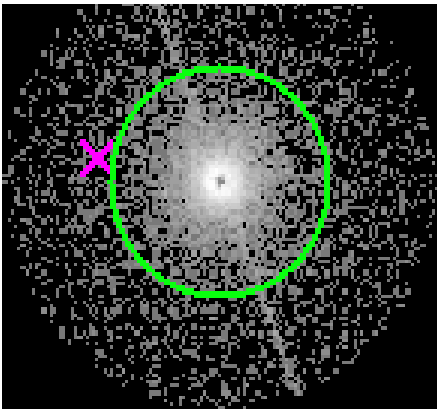


# 3 Gratings

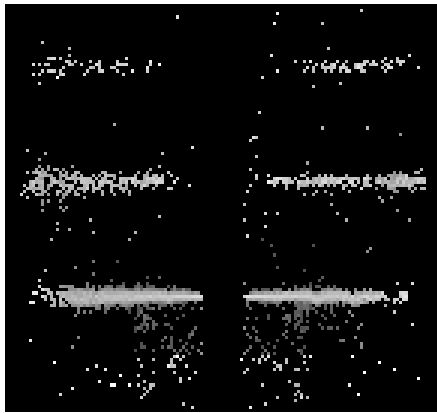
## 3.1 HEG Arm



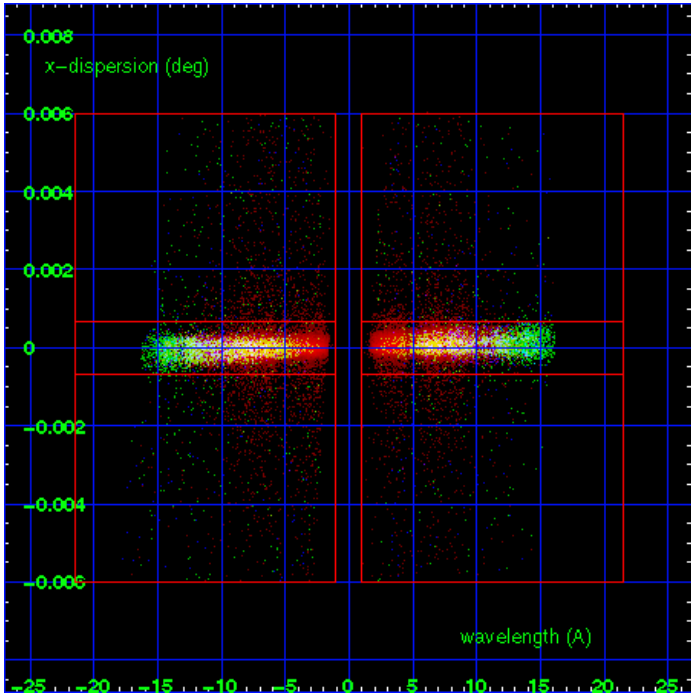
HEG Order Sort 123



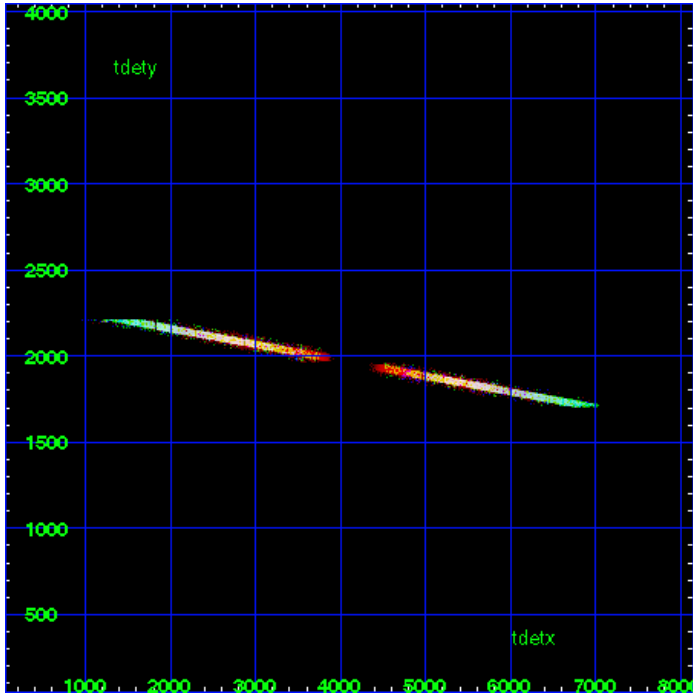
HEG Zero Order



HEG Order Sort ALL

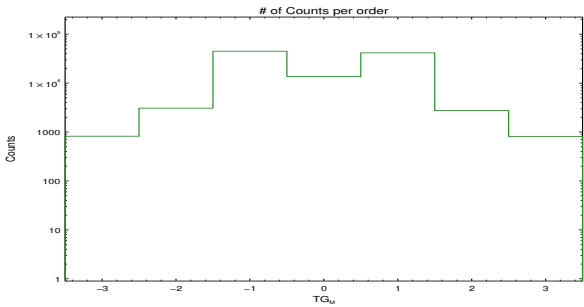


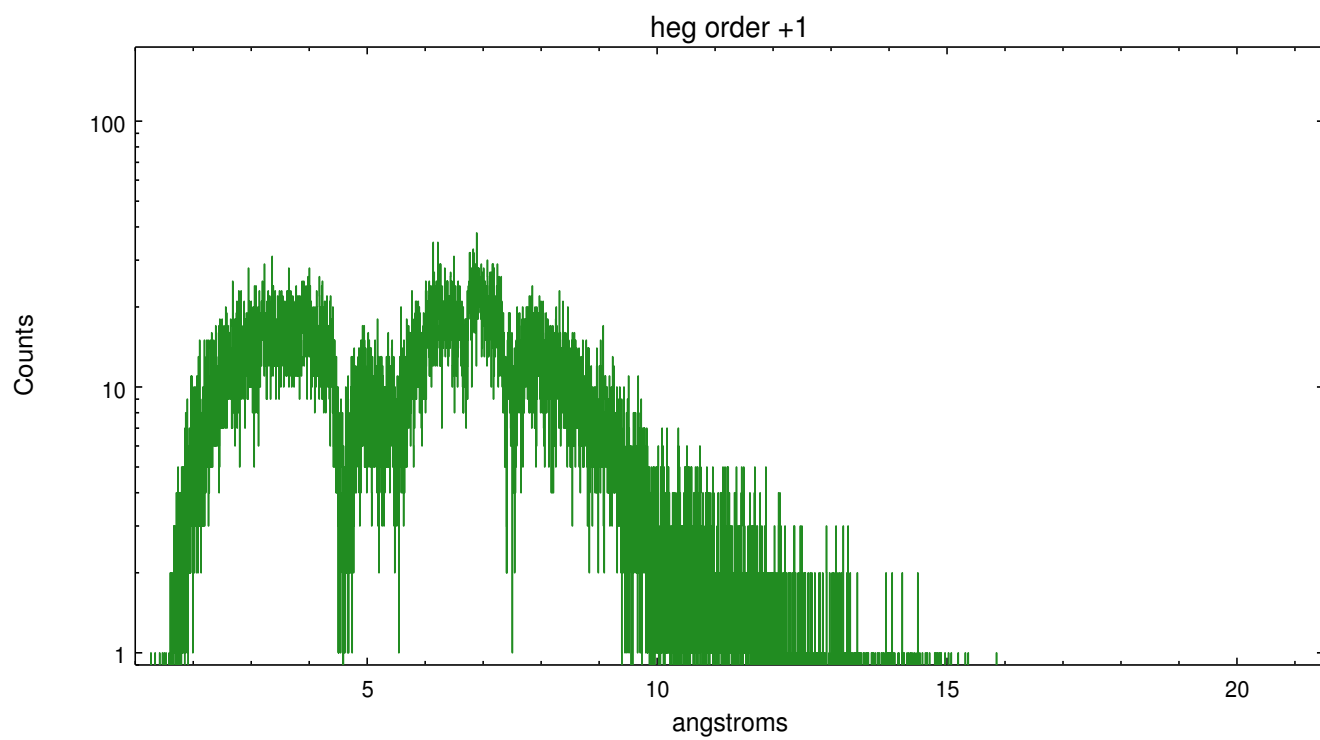
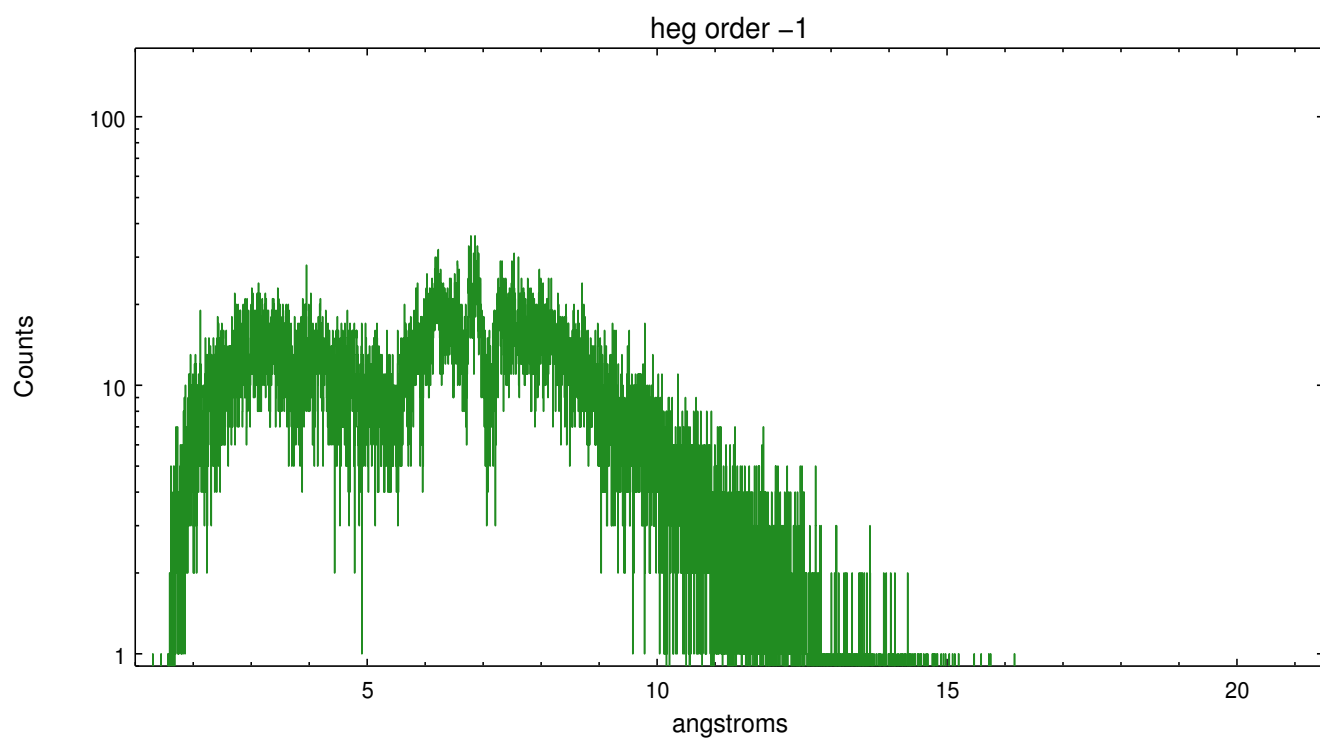
Spot Image HEG



Full Detector HEG

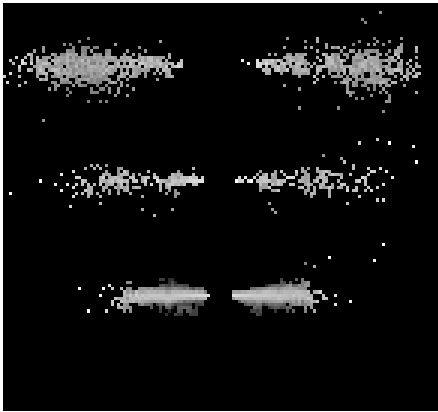
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	823	3084	44974	13689	41716	2756	814



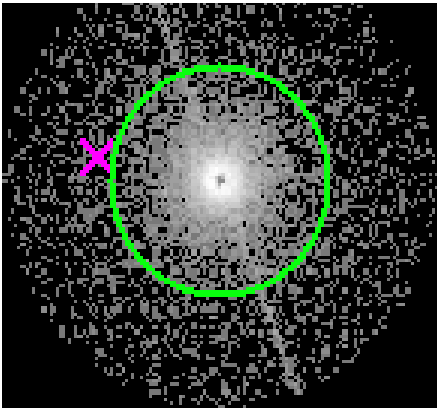




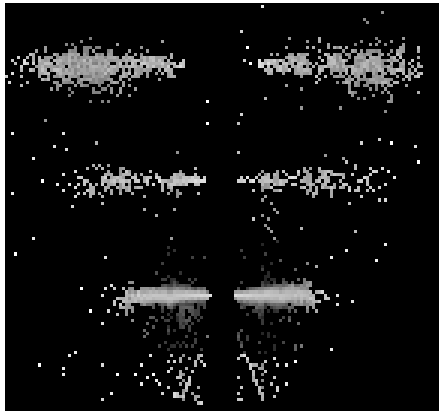
3.2 MEG Arm



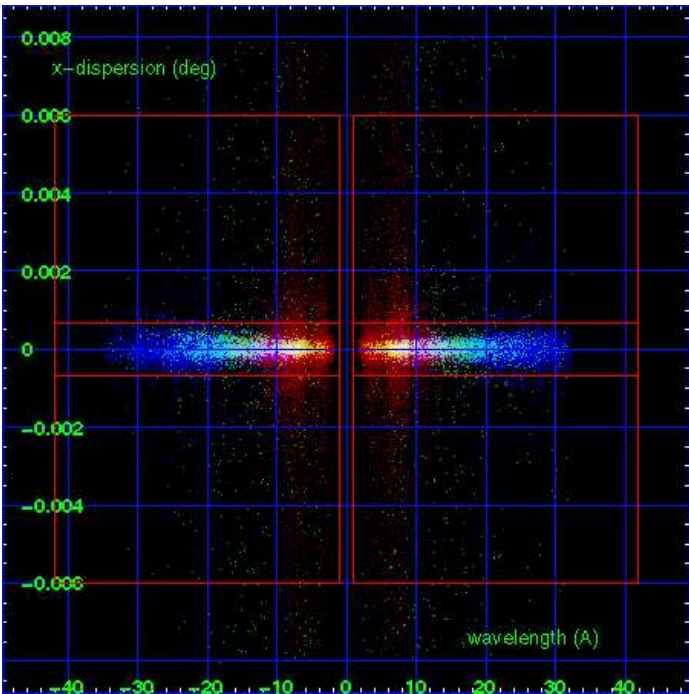
MEG Order Sort 123



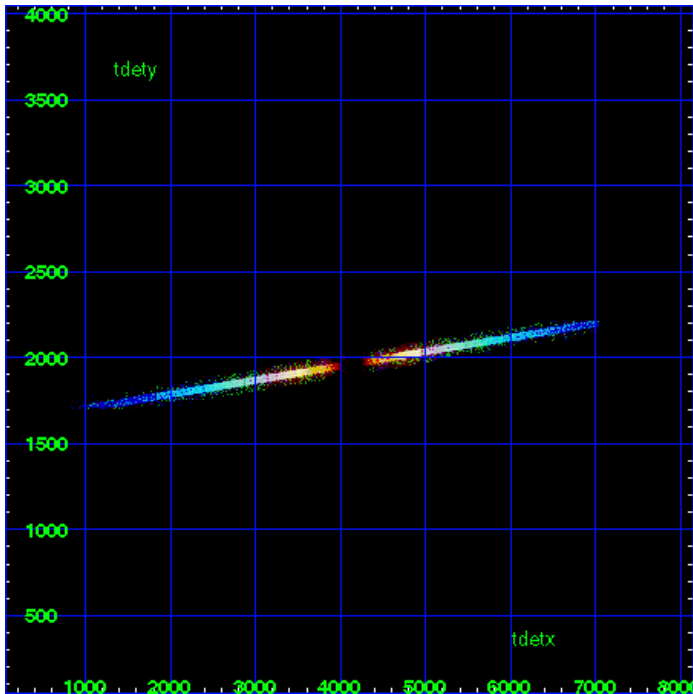
MEG Zero Order



MEG Order Sort ALL

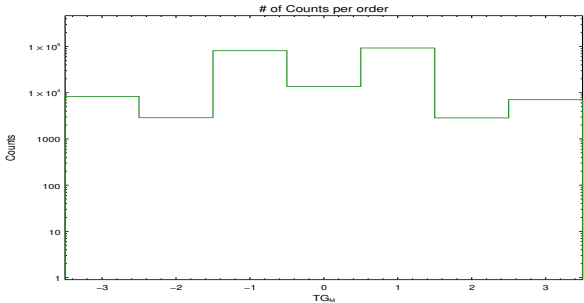


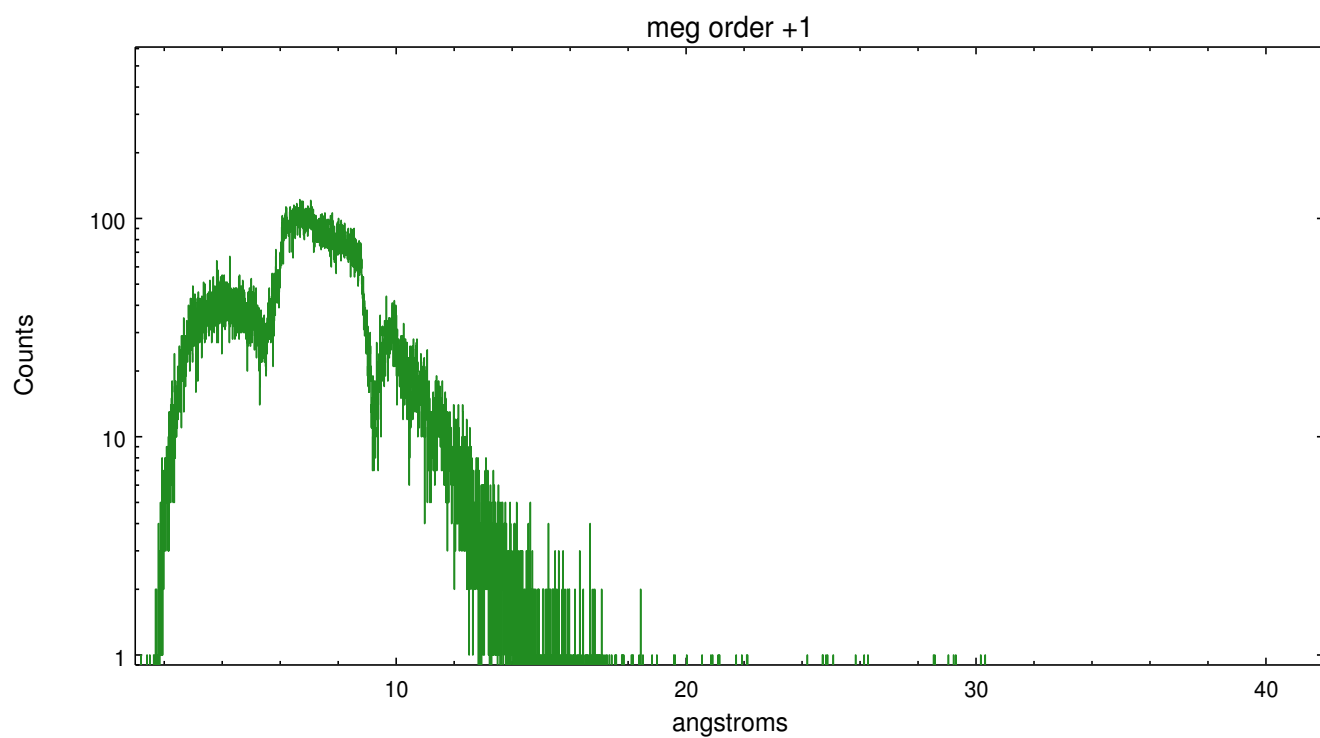
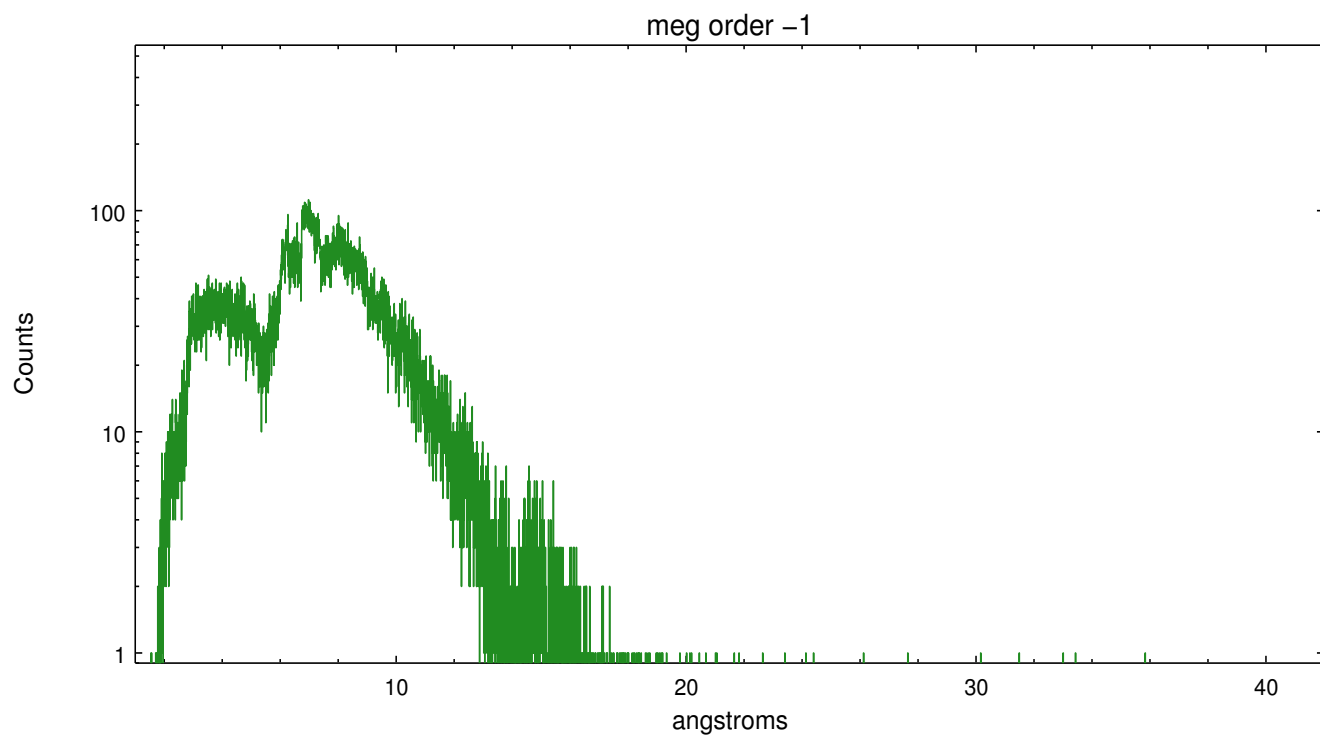
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	8322	2885	81407	13689	92984	2853	7085





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.06.21
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	18.569099869847

## 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=4130.62, y=4090.21) 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.