

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 2703 - L2 Version 3  
Chandra X-Ray Center

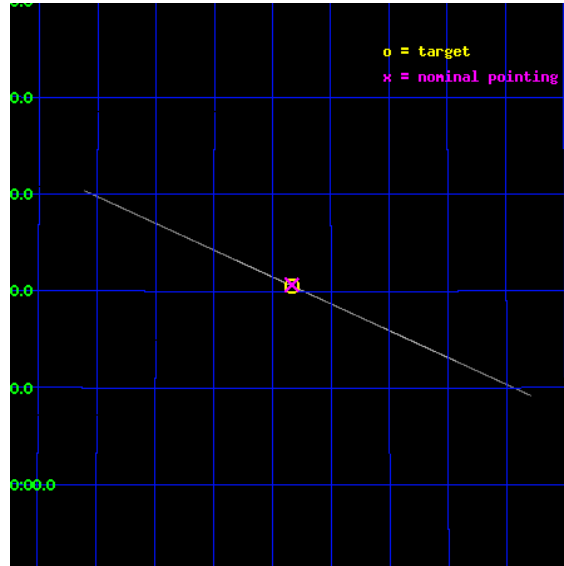
L2 Processing Date : Oct 10 2012

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# 1 Front

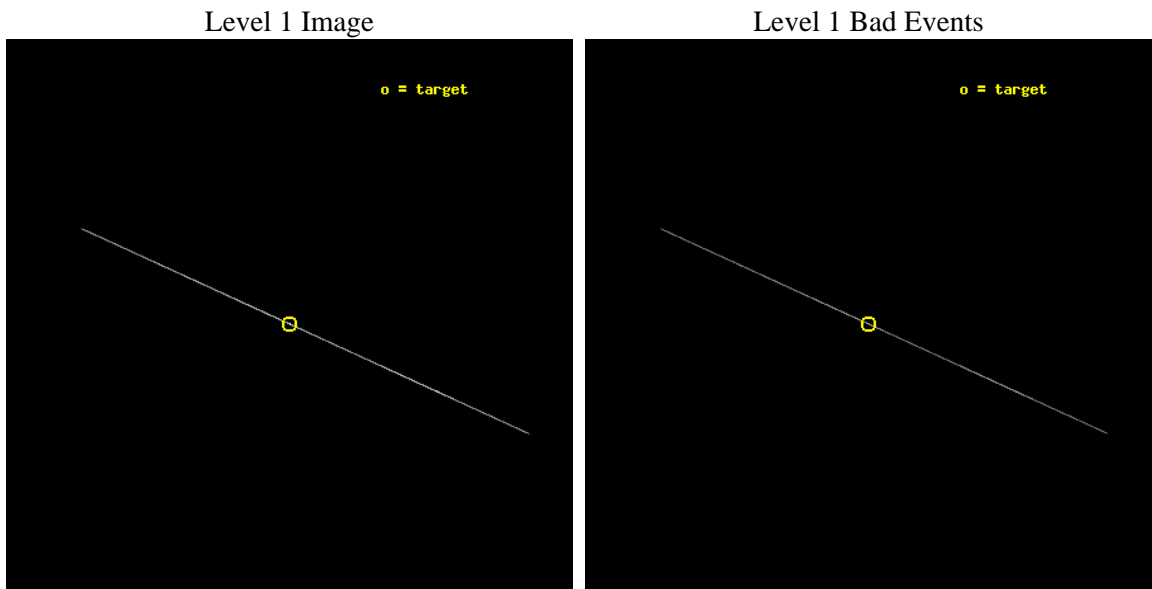
seq_num	400183	Sequence number
obs_id	2703	Observation id
title	HIGH RESOLUTION SPECTROSCOPY OF HERCULES X-1	Proposal title
observer	Dr. Daniel Scott	Principal investigator
object	HER X-1 MAIN HI PEAK	Source name
ra_targ	254.4575	Observer's specified target RA [deg]
dec_targ	35.342472	Observer's specified target Dec [deg]
ra_nom	254.45826774972	Nominal RA [deg]
dec_nom	35.344566159033	Nominal Dec [deg]
roll_nom	204.34507273263	Nominal Roll [deg]
revision	3	Processing version of data
ontime	9145.0	Sum of GTIs [s]
livetime	9109.27734375	Livetime [s]
ontime4	9145.0	Sum of GTIs [s]
ontime5	9145.0	Sum of GTIs [s]
ontime6	9145.0	Sum of GTIs [s]
ontime7	9145.0	Sum of GTIs [s]
ontime8	9145.0	Sum of GTIs [s]
ontime9	9145.0	Sum of GTIs [s]
l2events	137245	Number of level 2 events



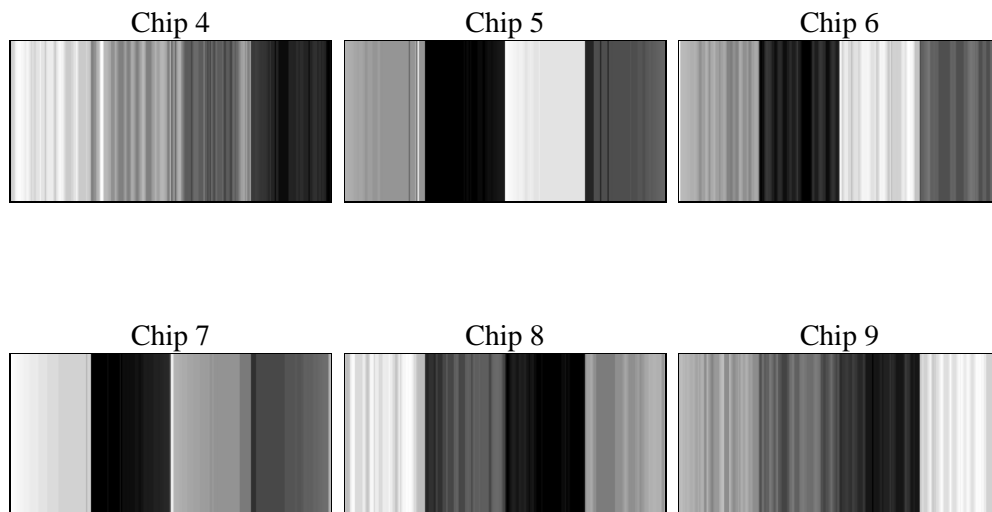
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	9000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	9145.0	Sum of GTIs [s]
caldsver	4.5.2	&#160	ontime4	9145.0	Sum of GTIs [s]
date	2012-10-10T03:24:35	Date and time of file creation	ontime5	9145.0	Sum of GTIs [s]
revision	3	Processing version of data	ontime6	9145.0	Sum of GTIs [s]
			ontime7	9145.0	Sum of GTIs [s]
			ontime8	9145.0	Sum of GTIs [s]
			ontime9	9145.0	Sum of GTIs [s]
			l1events	236565	Number of level 1 events

### 2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	15143	83797	20906	69565	30954	16200
rejected events	4286	18544	4733	13858	7365	4849
rejected %	28%	22%	22%	19%	23%	29%

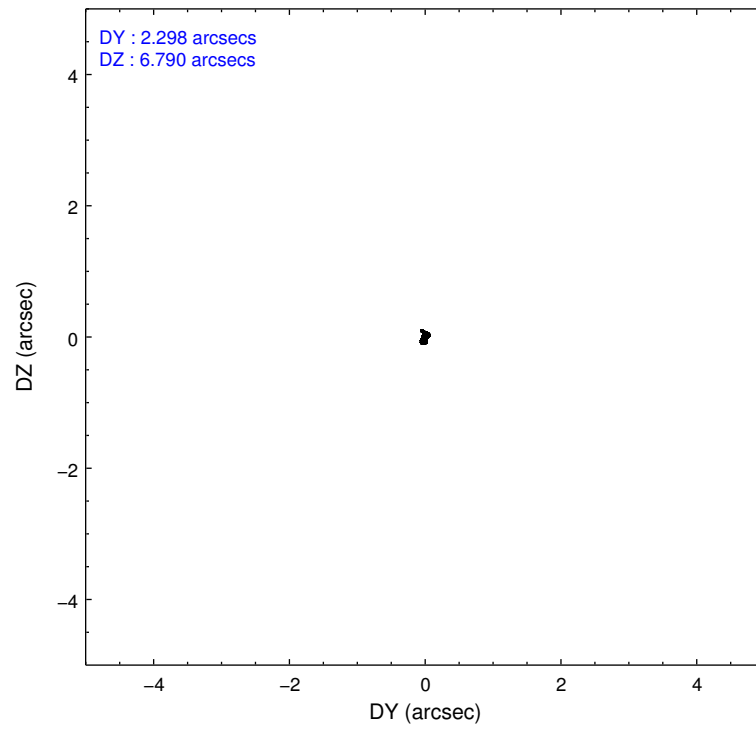
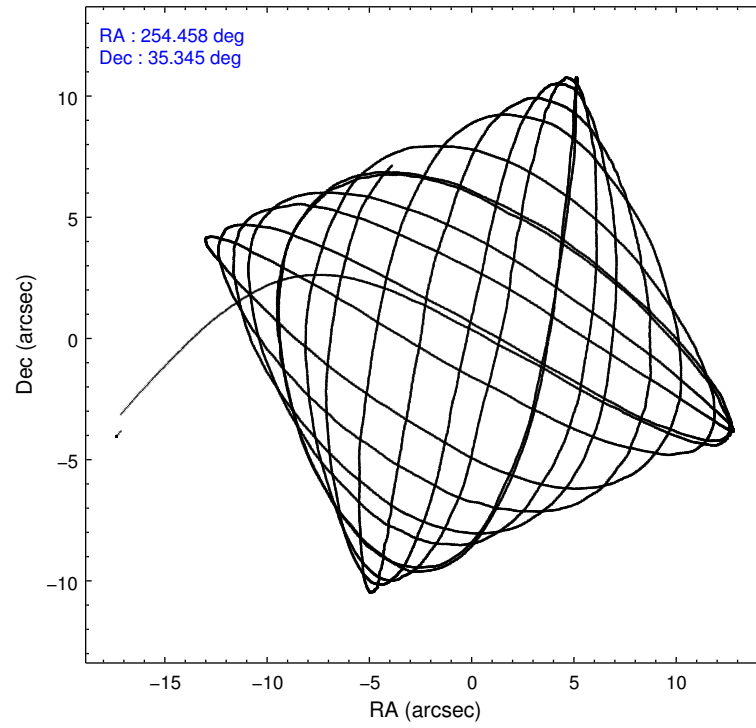
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	1552	26682	2006	9009	5419	1749
	10%	31%	9%	12%	17%	10%
grade 1 events	51	100	50	134	88	59
	0%	0%	0%	0%	0%	0%
grade 2 events	4884	20335	8841	15525	8583	4774
	32%	24%	42%	22%	27%	29%
grade 3 events	1772	1428	1713	4982	3050	1652
	11%	1%	8%	7%	9%	10%
grade 4 events	1875	1325	1687	4878	2951	1851
	12%	1%	8%	7%	9%	11%
grade 5 events	2441	6348	2888	7601	3849	2952
	16%	7%	13%	10%	12%	18%
grade 6 events	2568	27579	3721	27436	7014	3163
	16%	32%	17%	39%	22%	19%
grade 7 events	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%

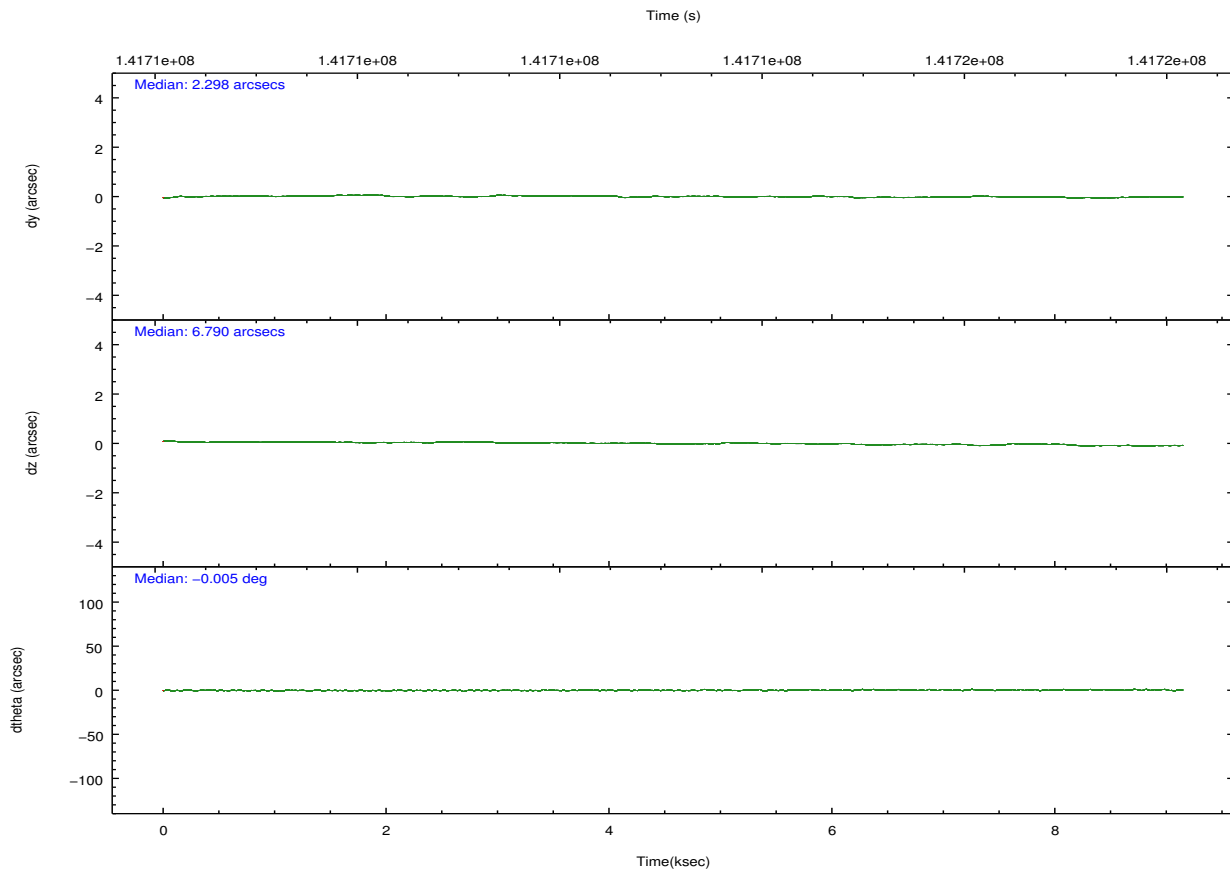
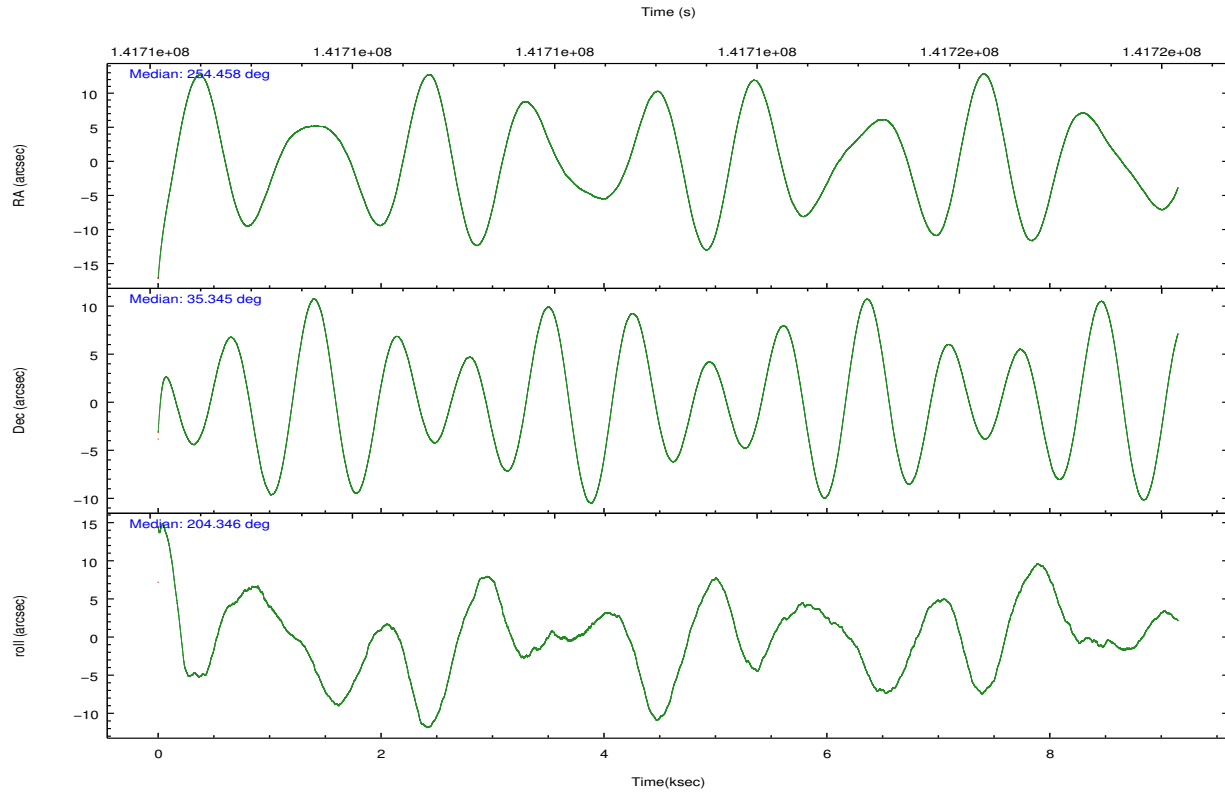


## 2.2 Compared Parameters

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	CC33_FAINT	CC33_FAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	254.477402	254.4582677497197	Subarray requested	NONE	NONE
[deg] Pointing Dec	35.366939	35.34456615903345	Alternating exposures requested	N	N
[deg] Pointing Roll	204.177372	204.345072732628	[s] Primary exposure time	0.000000	0
[s] Window start time (MET)	141704584.184000	141704584.184000			
[s] Window stop time (MET)	141743344.184000	141743344.184000			
[mm] SIM focus pos	-0.684267	-0.6828225247311905			
[mm] SIM defocus	0	0.001444936568705701			
[mm] SIM translation stage pos	-186.132523	-186.1372760897884			
[mm] SIM translation stage offset	-4	-3.99524649321944			
Phase constraints	Y	Y			
[d] Phase period	34.853430	34.853430			
[d] Phase epoch (MJD)	52242.791000	52242.791000			
Phase start	0.050000	0.050000			
Phase end	0.100000	0.100000			
Phase start error	0.001000	0.001000			
Phase end error	0.001000	0.001000			
[s] Observation start time (MET)	141708695.184000	141706801.97733			
Observation start date	2002-06-29T03:30:31	2002-06-29T03:00:01			
[s] Observation end time (MET)	141717695.184000	141718293.2528			

## 2.3 Aspect



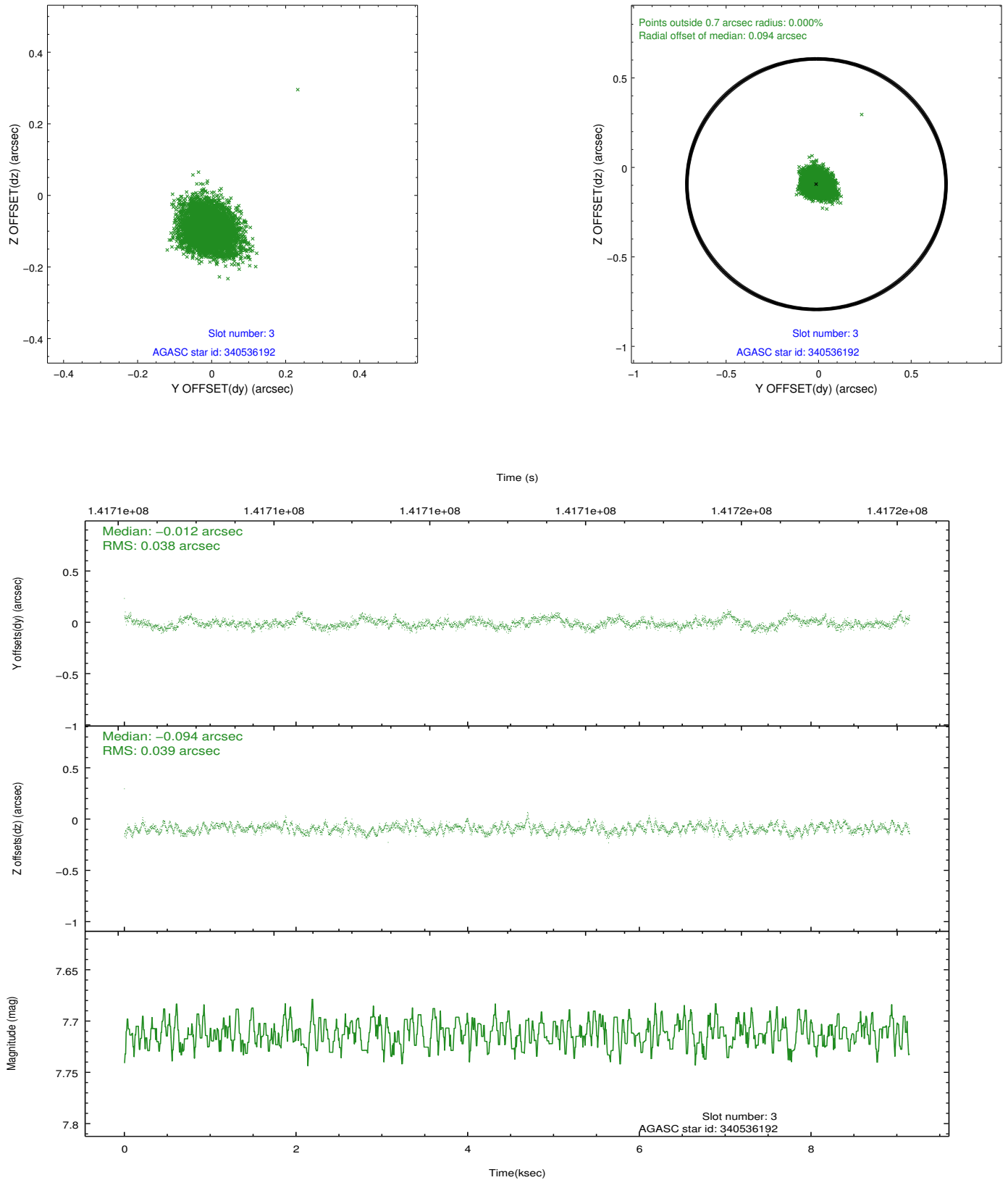


### Slot Statistics

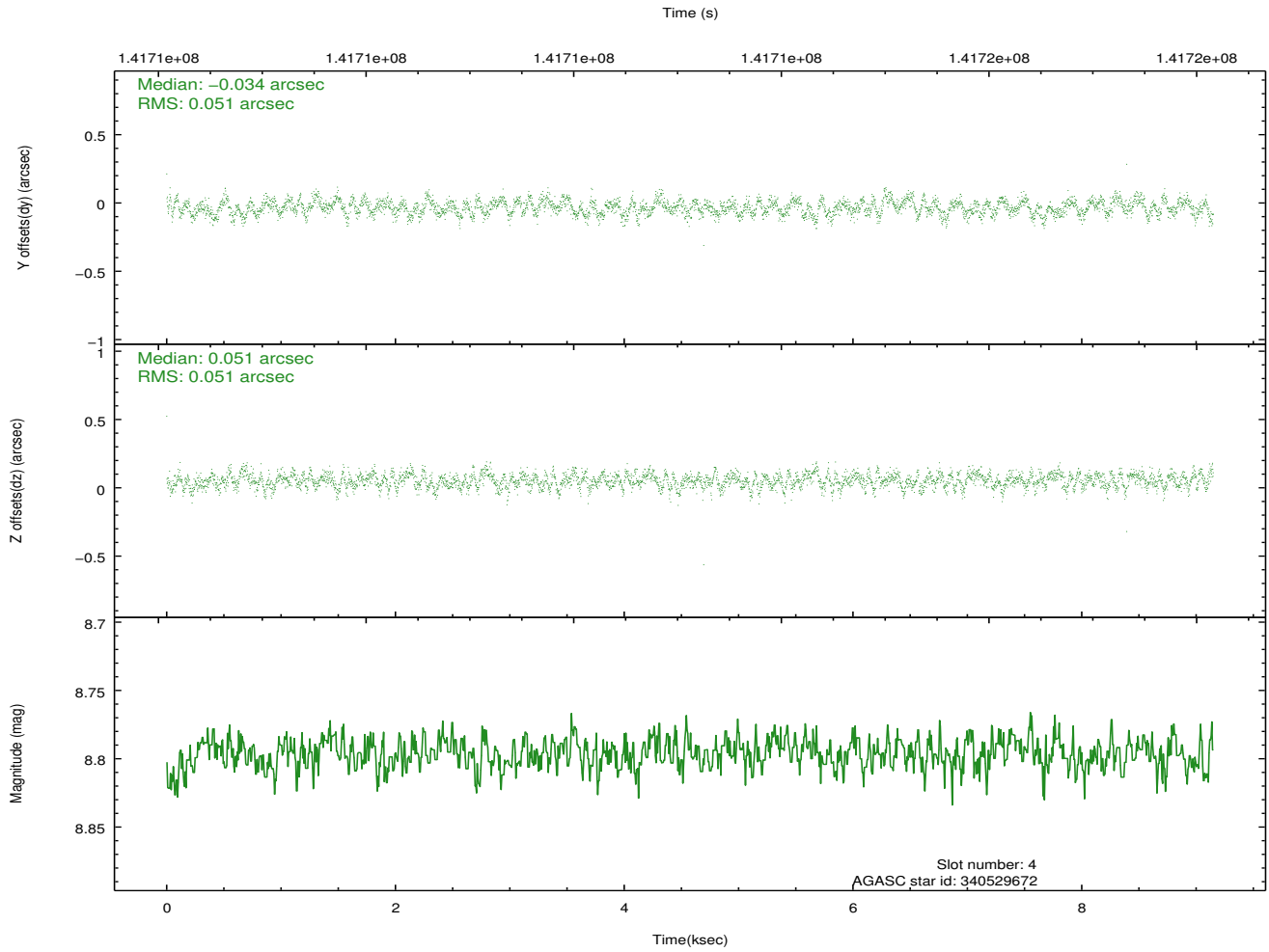
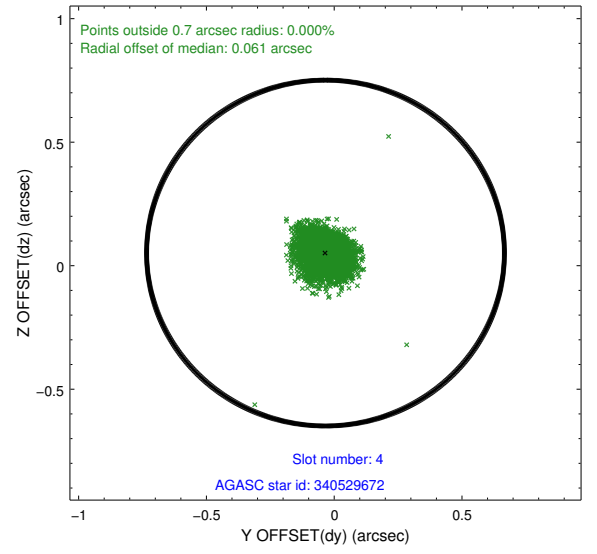
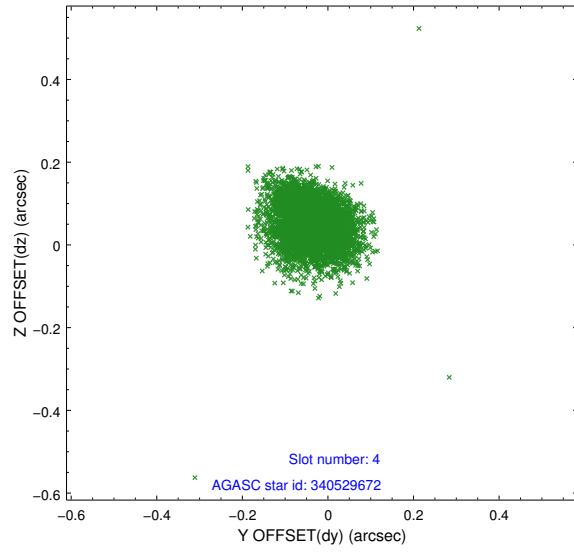
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	2232	-0.050	-0.071	0.007	0.011	0.000000	0.000000	-754.67	-1810.45
1	FID	ACIS-S-4	7.19	2232	0.027	0.043	0.005	0.010	0.000000	0.000000	2158.39	97.53
2	FID	ACIS-S-5	7.23	2232	-0.008	0.036	0.006	0.011	0.000000	0.000000	-1806.73	91.82
3	GUIDE	340536192	7.71	4460	-0.012	-0.094	0.057	0.093	254.294567	35.286536	608.17	44.08
4	GUIDE	340529672	8.80	4463	-0.034	0.051	0.076	0.123	254.827180	34.864332	-202.47	2072.90
5	GUIDE	340534080	8.83	4464	-0.001	-0.013	0.061	0.099	255.228954	35.471551	-2168.19	552.40
6	GUIDE	341060696	9.20	4460	0.013	0.067	0.085	0.146	254.855764	35.681180	-1473.91	-580.83
7	GUIDE	341058456	9.66	4460	0.038	-0.013	0.094	0.152	254.910348	35.836463	-1846.77	-1026.57

## 2.4 Star Slots

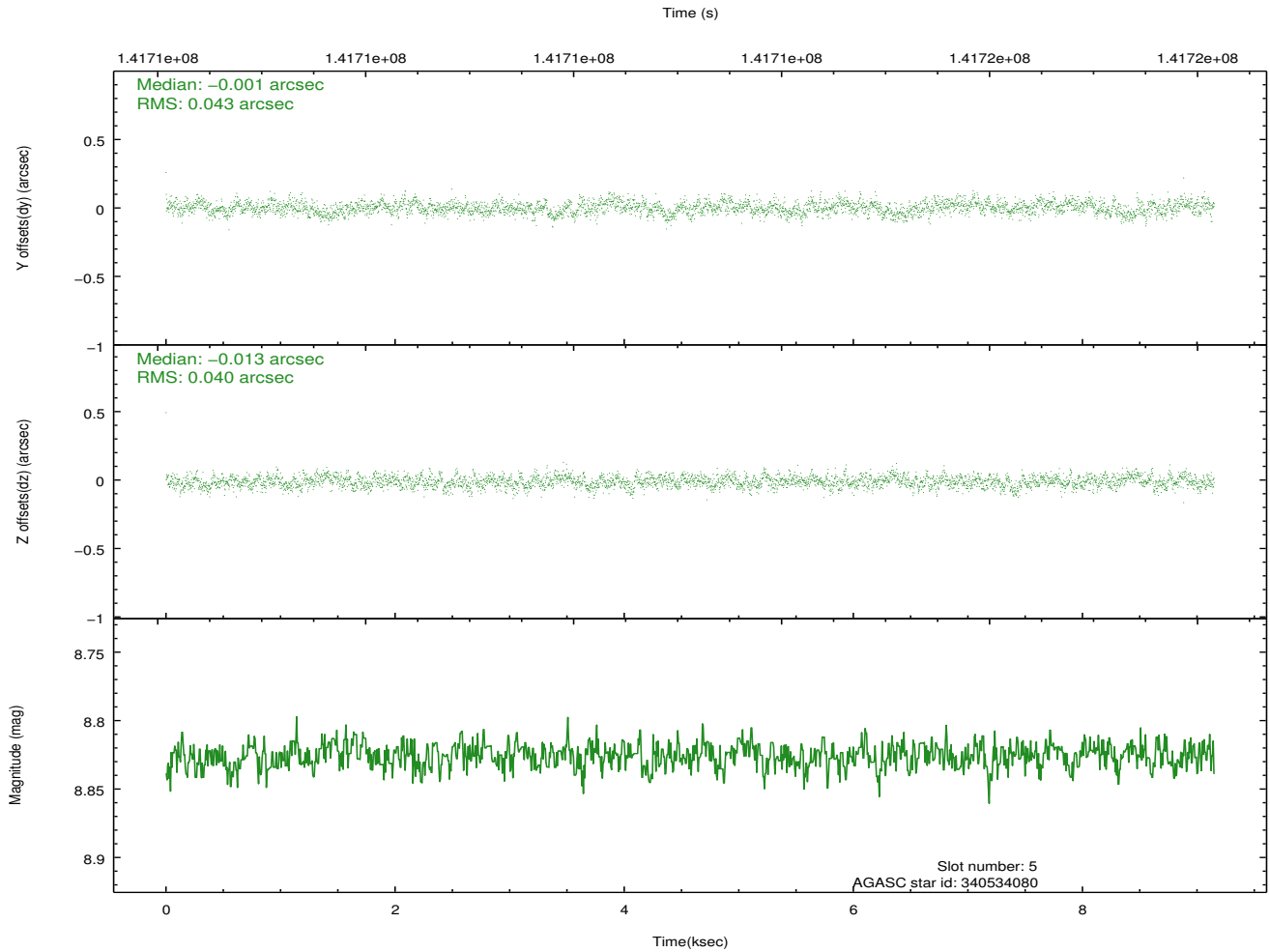
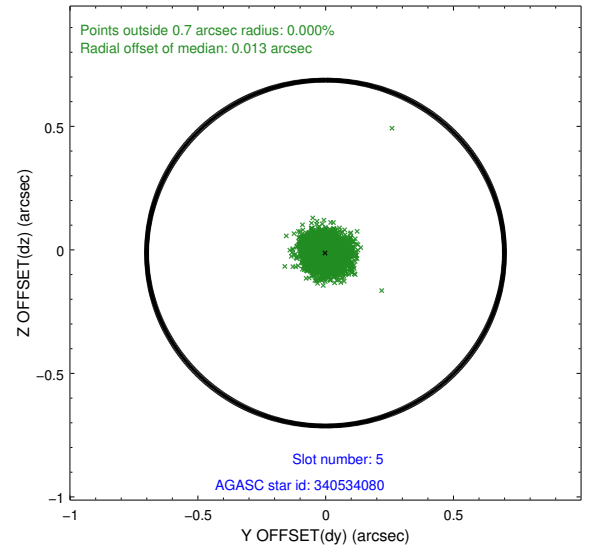
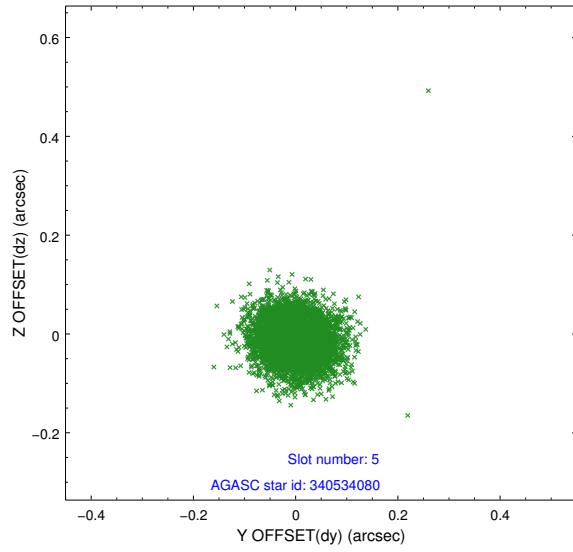
### 2.4.1 Slot 3



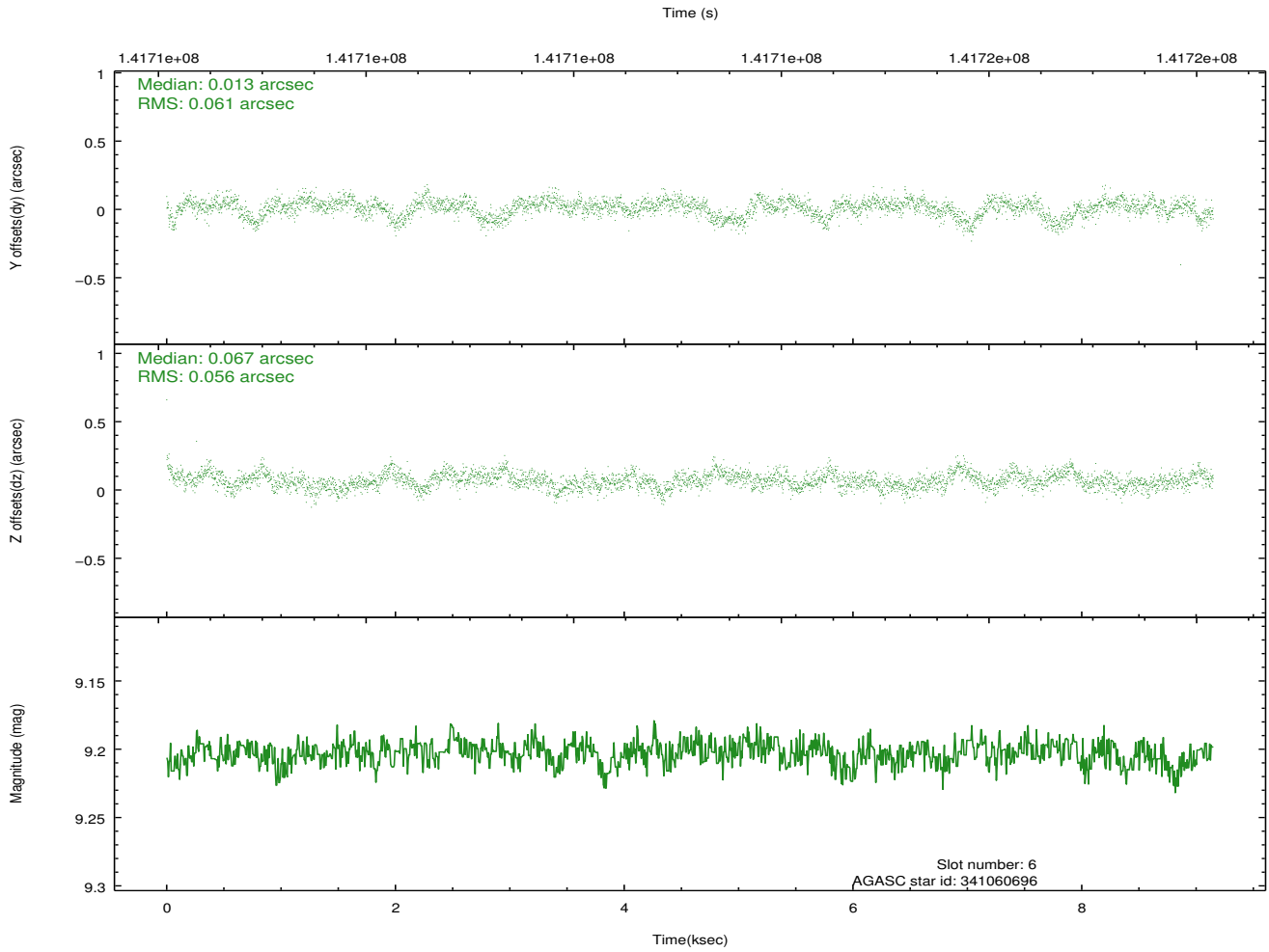
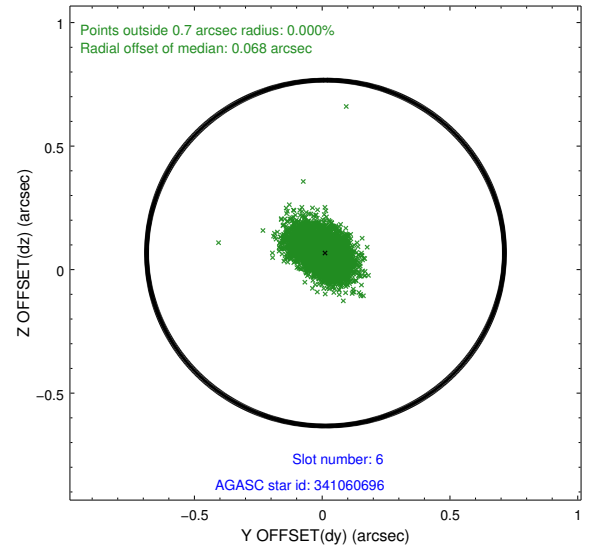
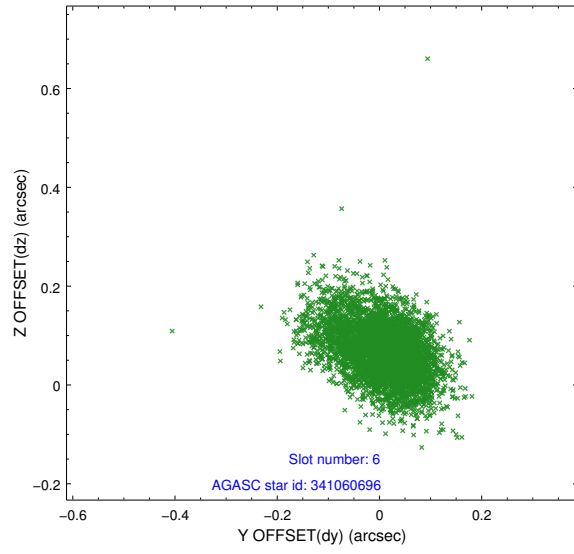
## 2.4.2 Slot 4



### 2.4.3 Slot 5

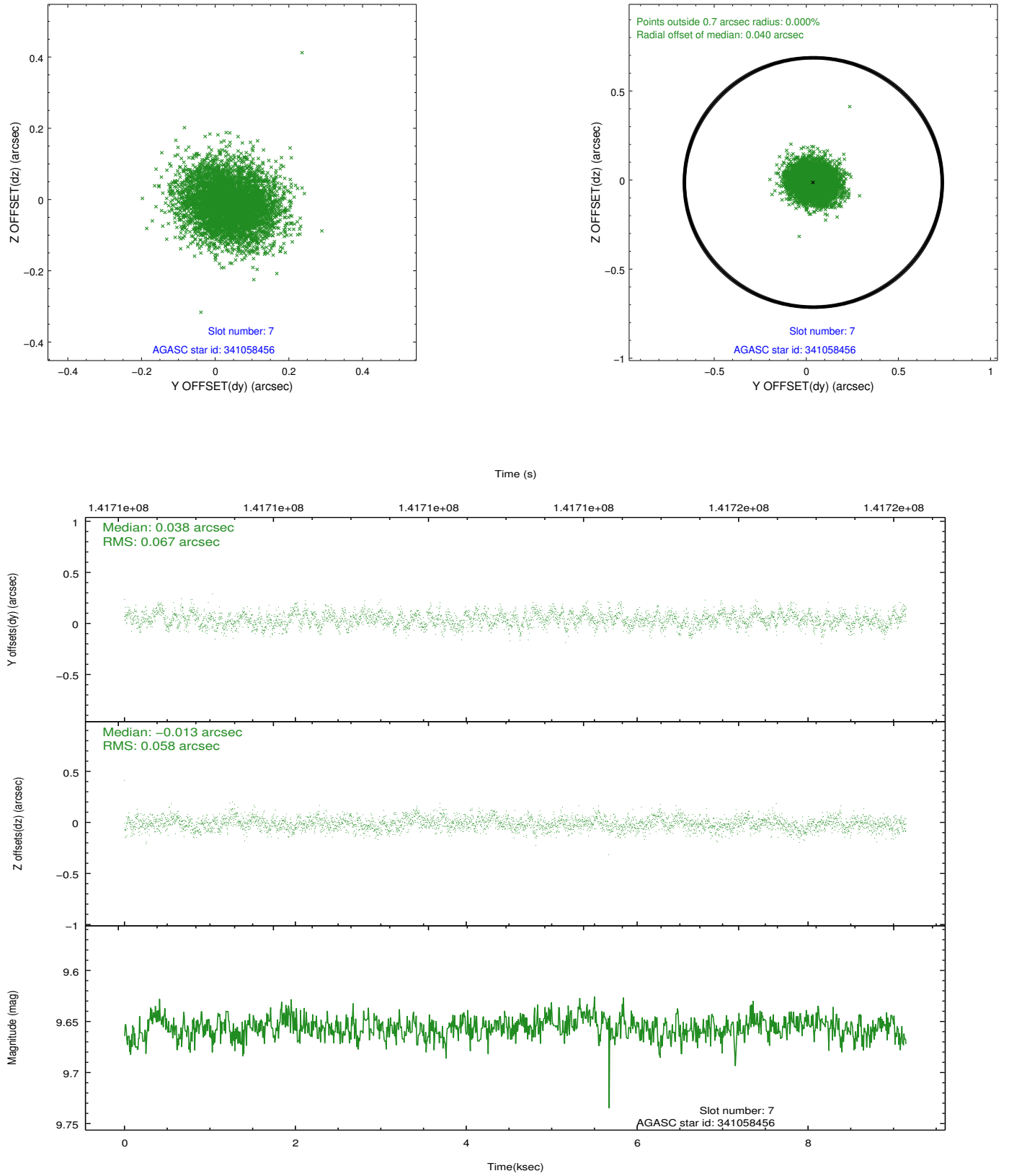


## 2.4.4 Slot 6



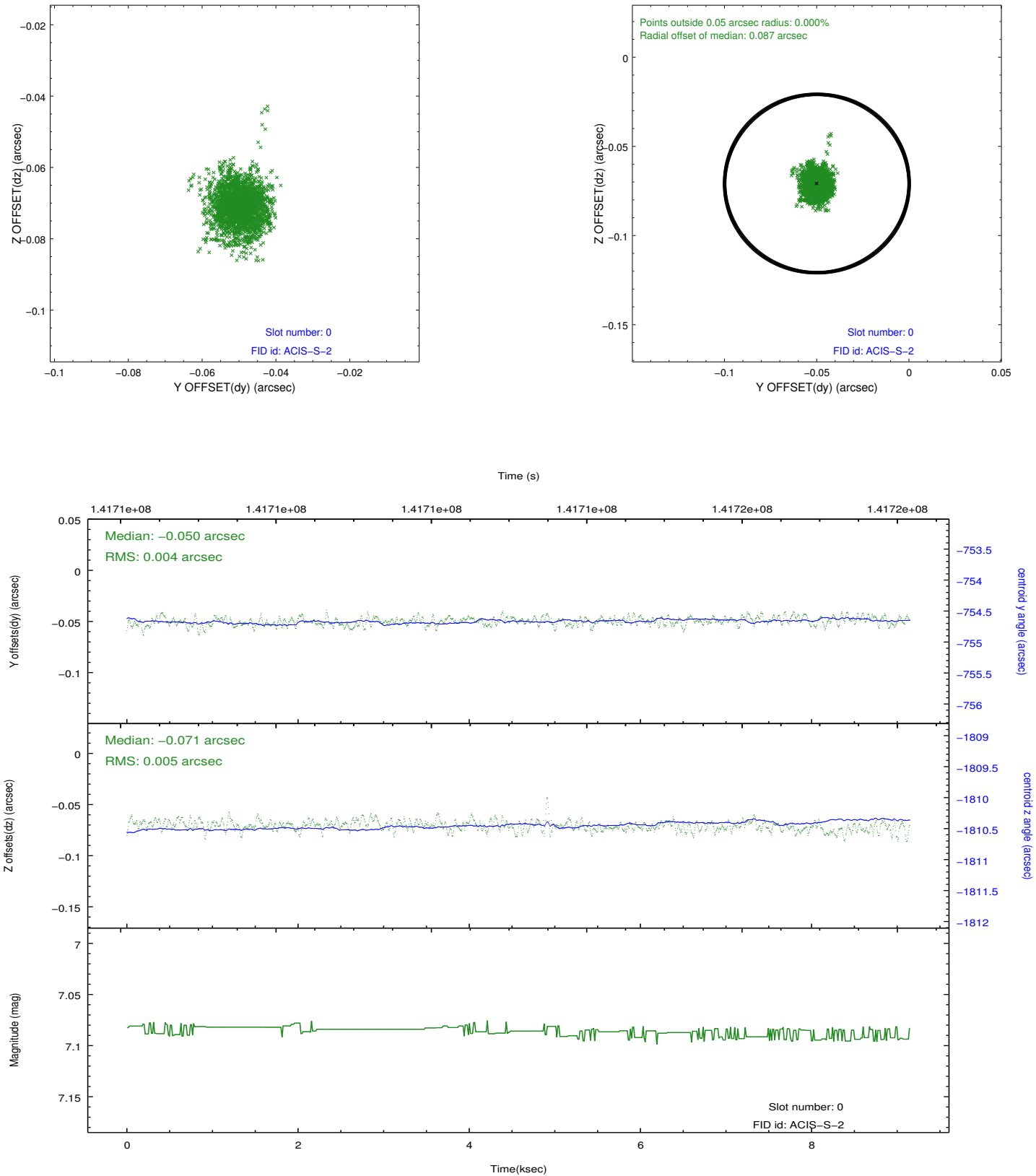


## 2.4.5 Slot 7

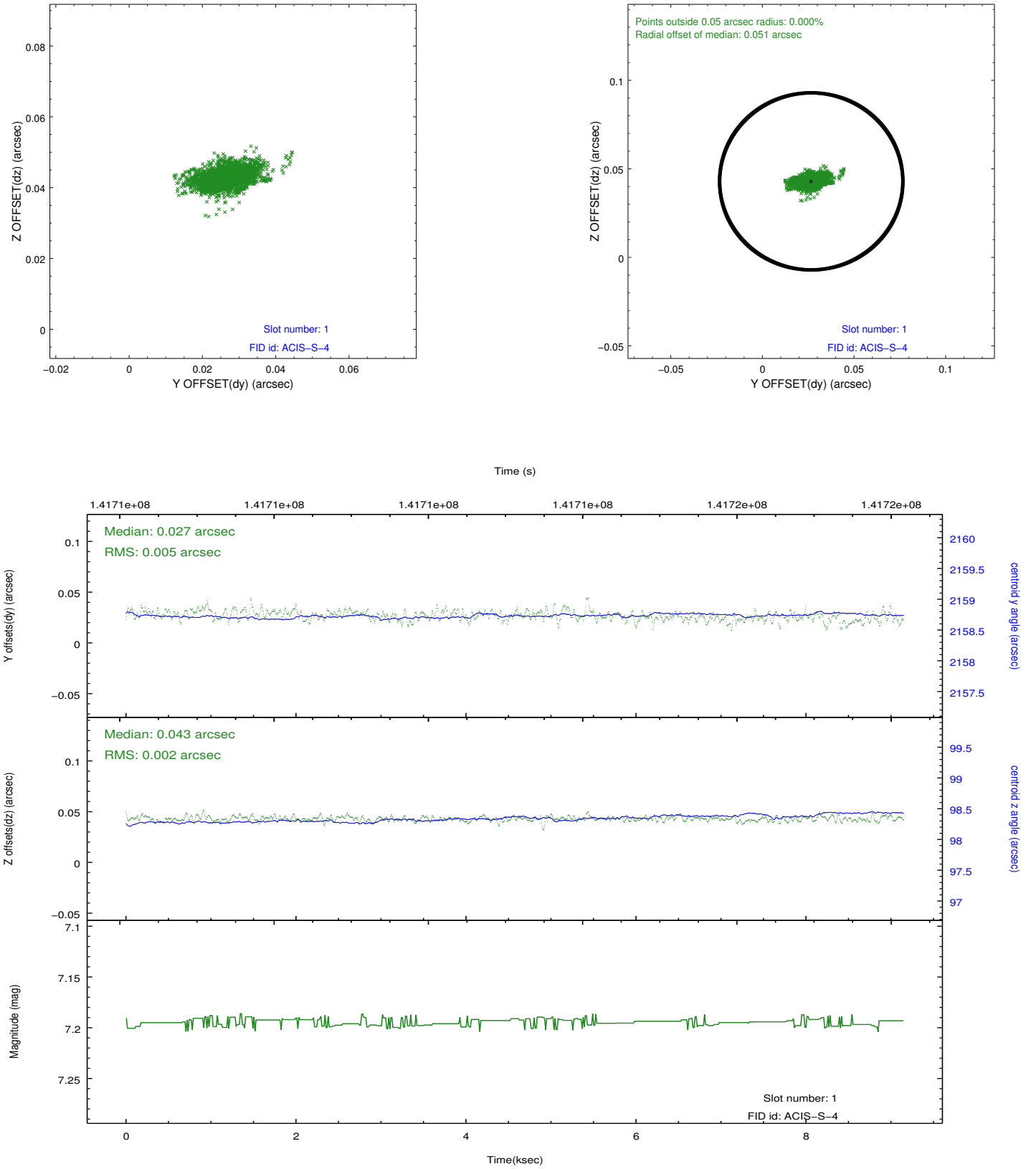


## 2.5 FID Slots

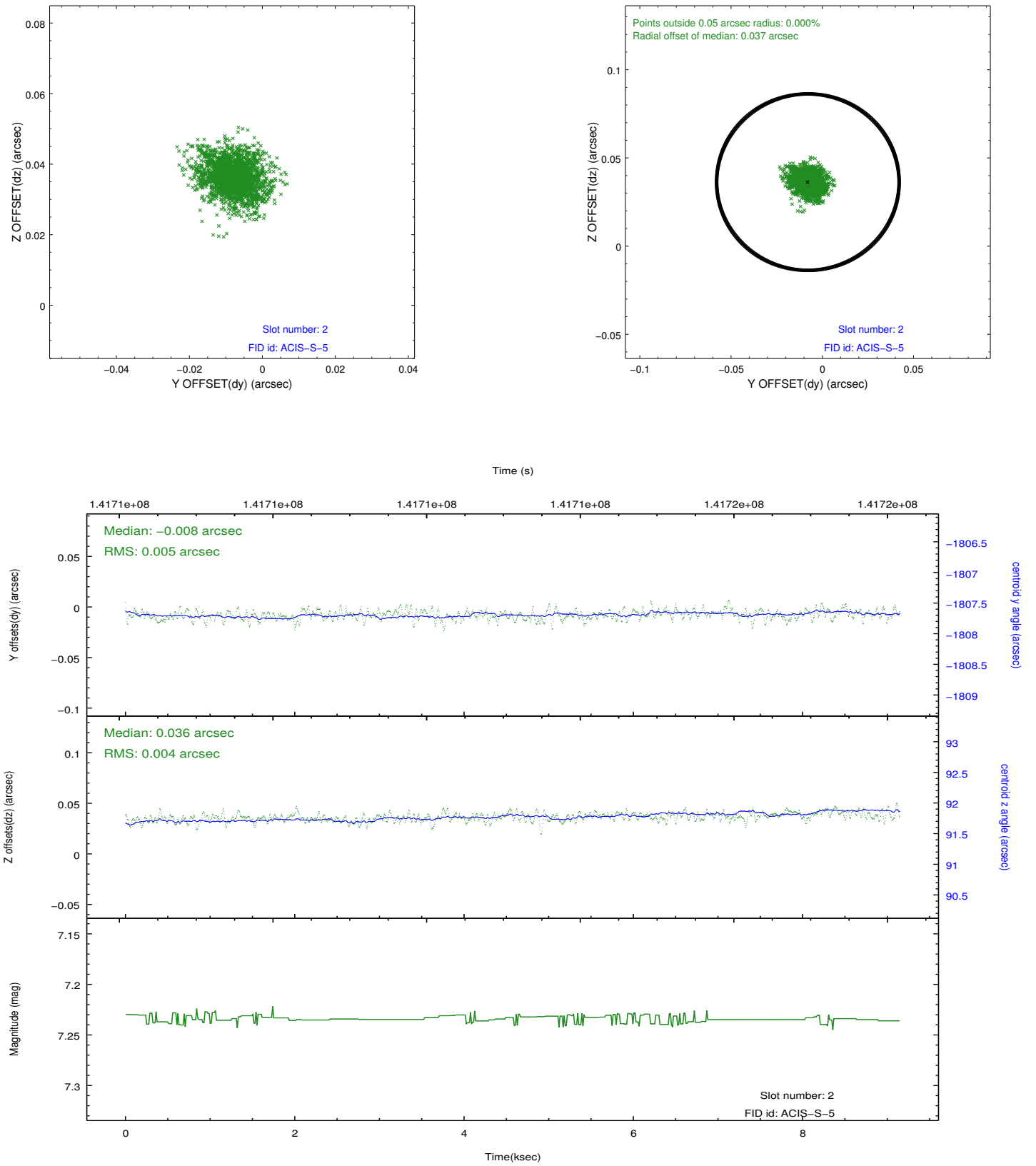
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# 3 Gratings

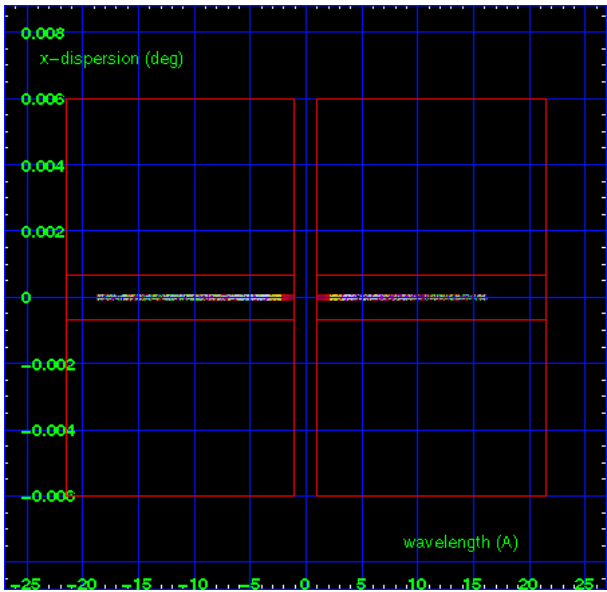
## 3.1 HEG Arm



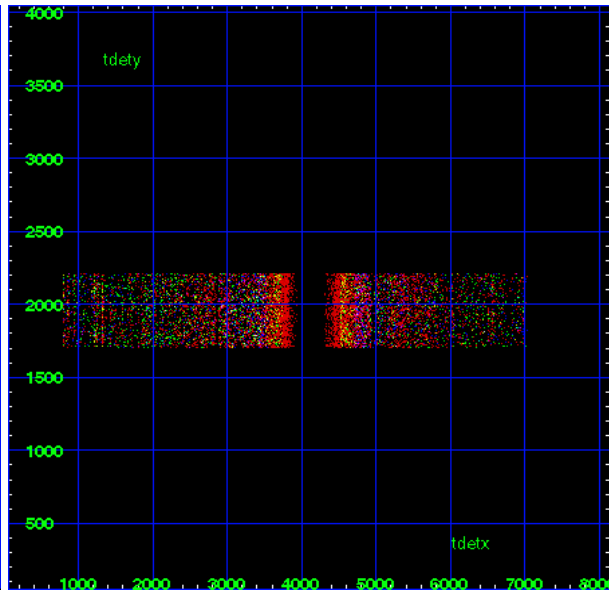
HEG Order Sort 123



HEG Order Sort ALL

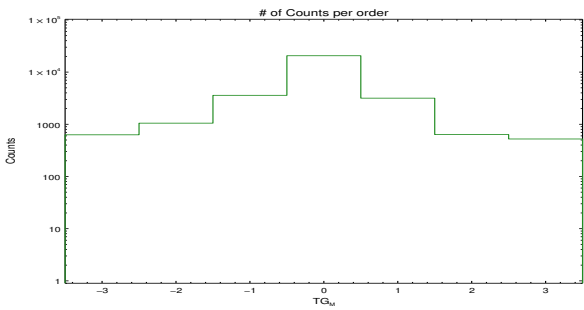


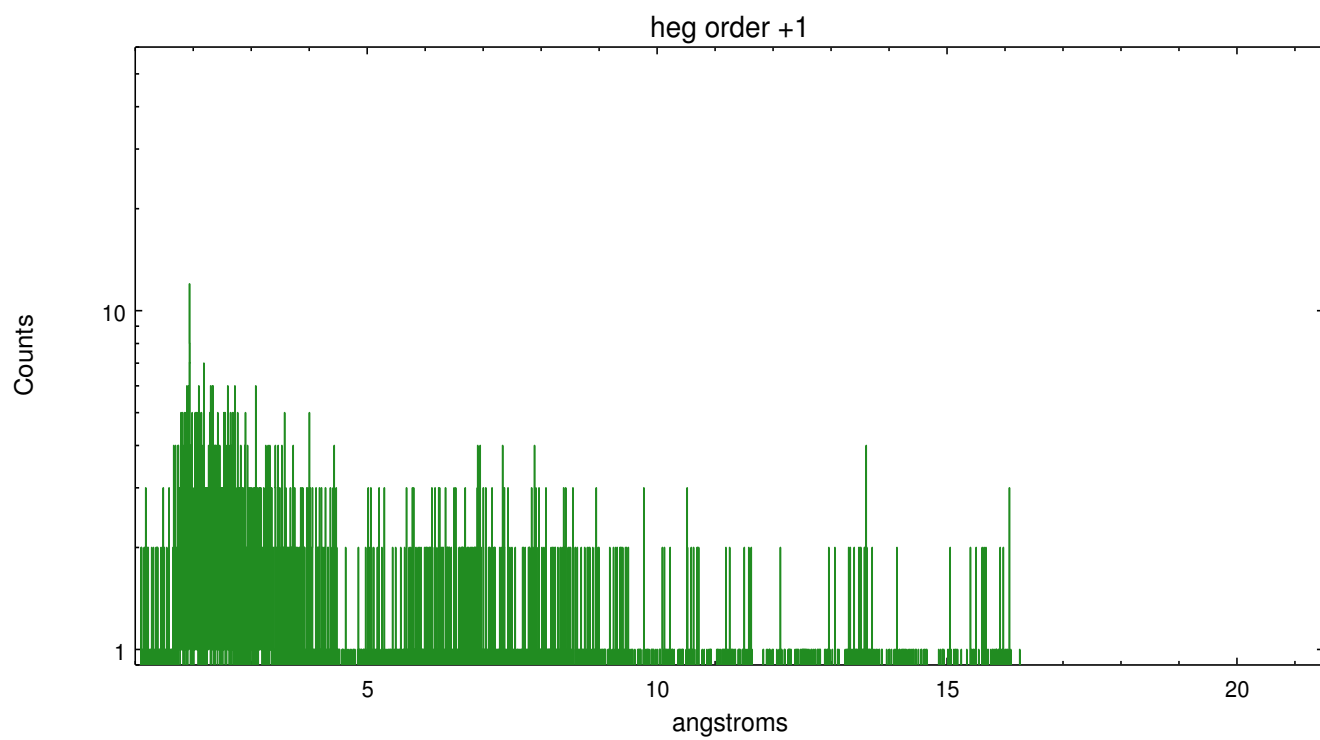
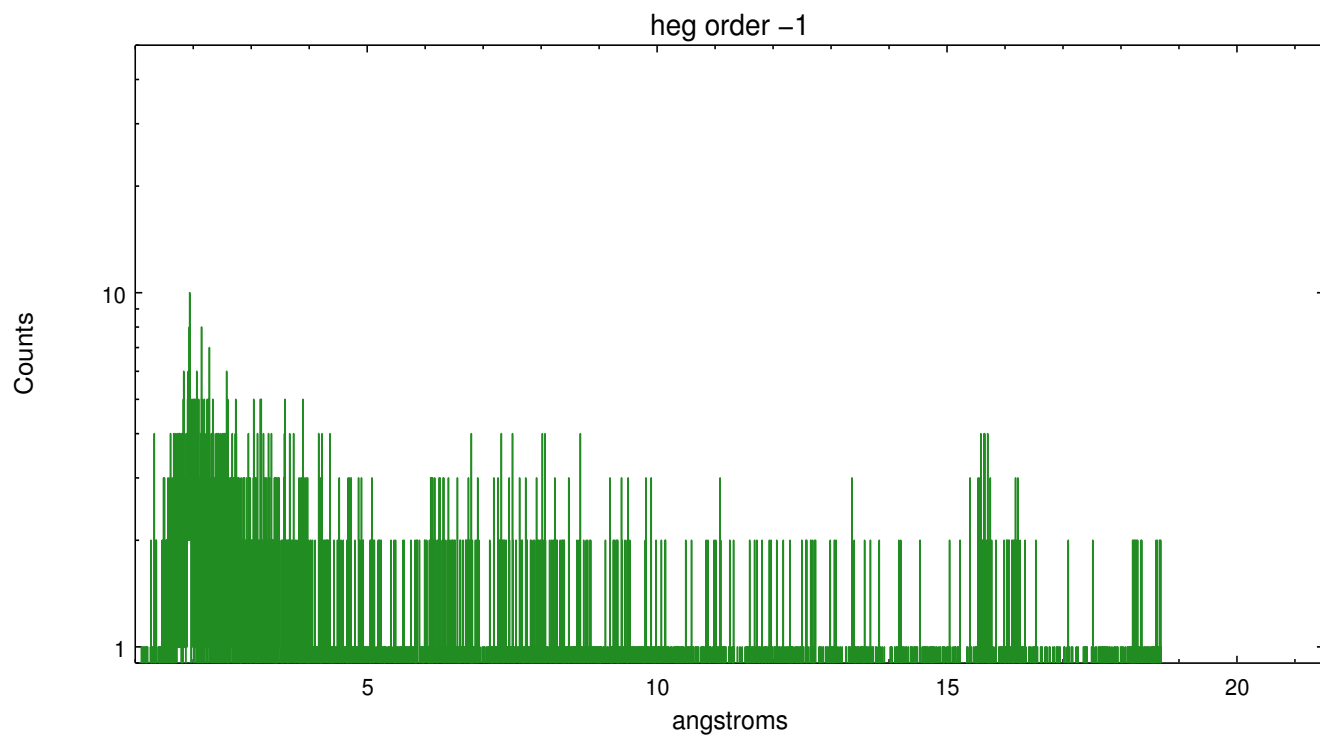
Spot Image HEG



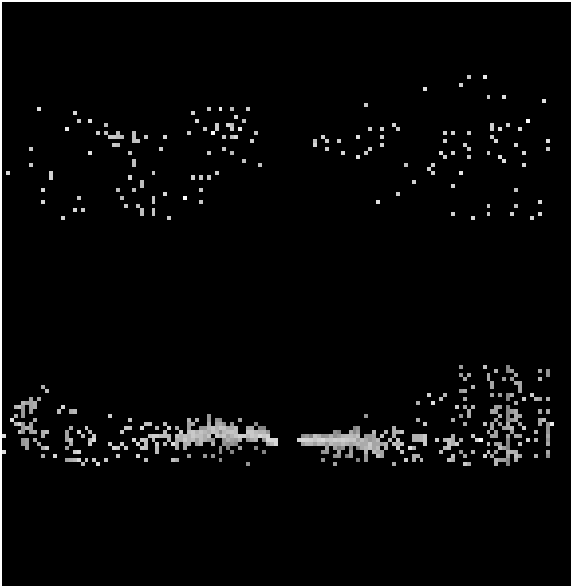
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	629	1051	3588	20598	3166	635	523





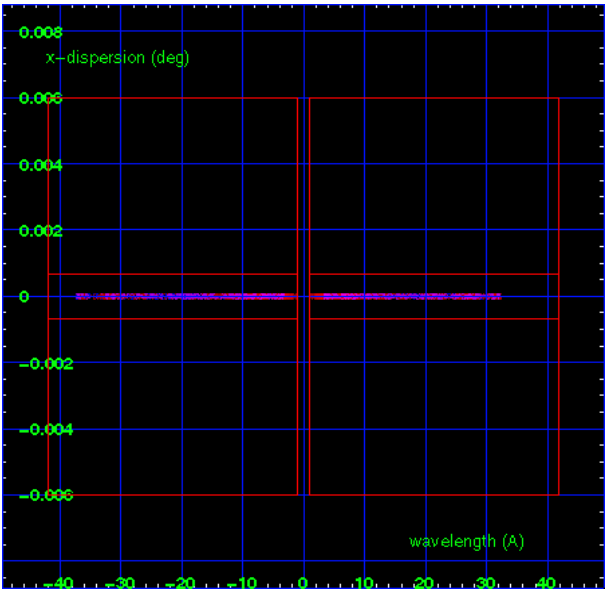
3.2 MEG Arm



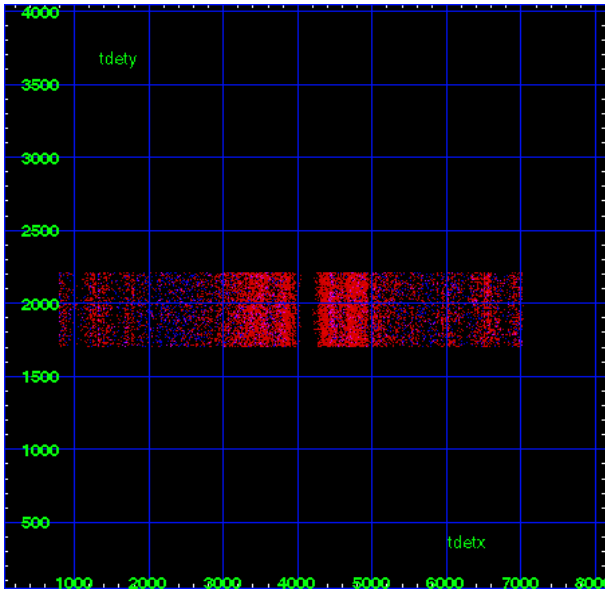
MEG Order Sort 123



MEG Order Sort ALL

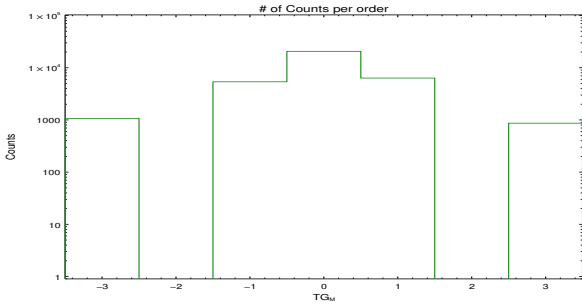


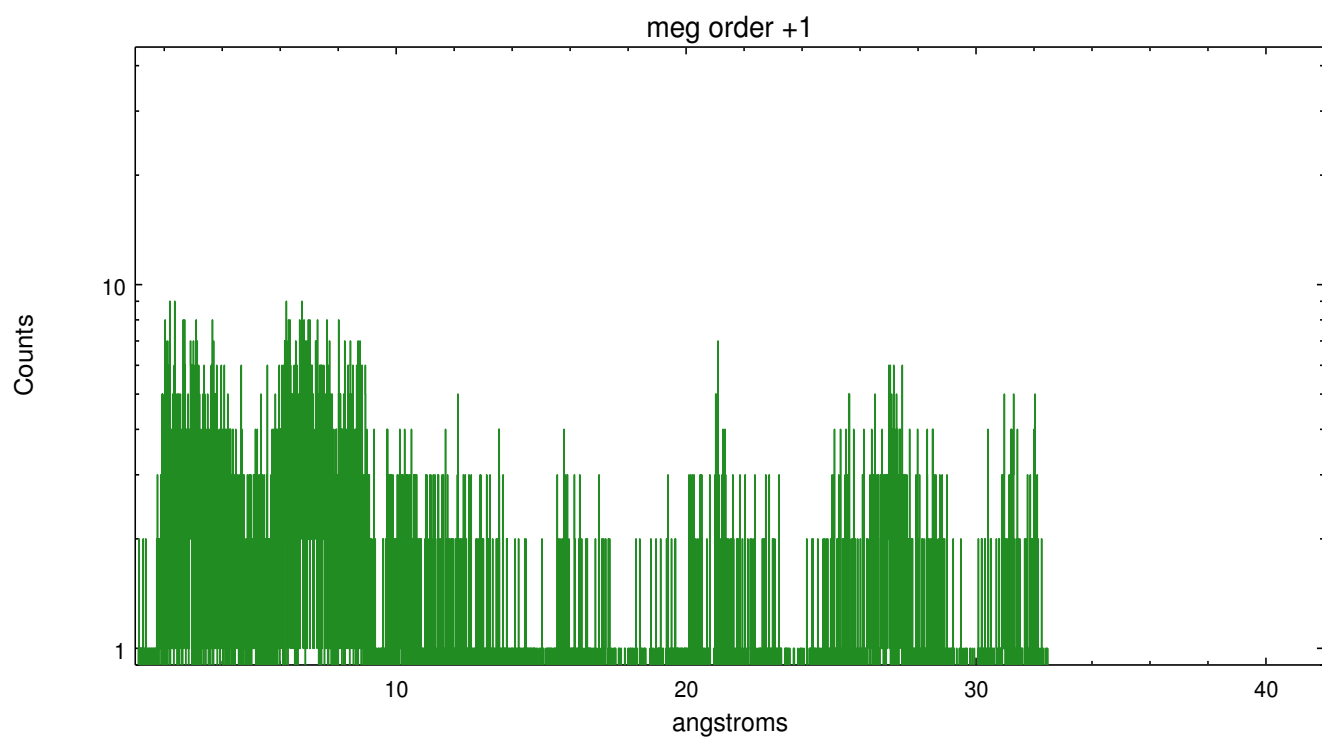
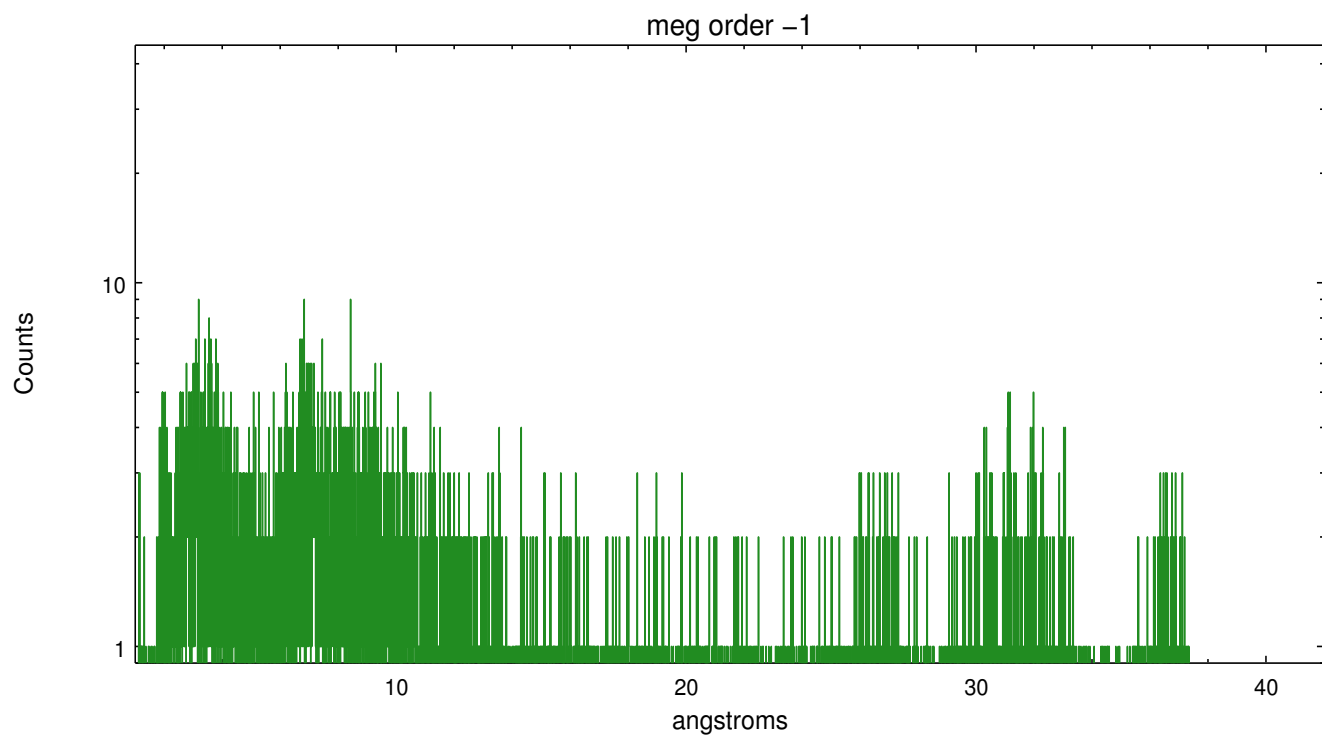
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1071	0	5381	20598	6339	0	866







## A Summary

### A.1 Status

V&V Scientist	David Huenemoerder
V&V Date (YYYY-MM-DD)	2012.10.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	9.148

### A.2 Comments

phase constraint met; observed phase  $\sim 0.065$ ; requested 0.05–0.10