

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 3143 - L2 Version 4  
Chandra X-Ray Center

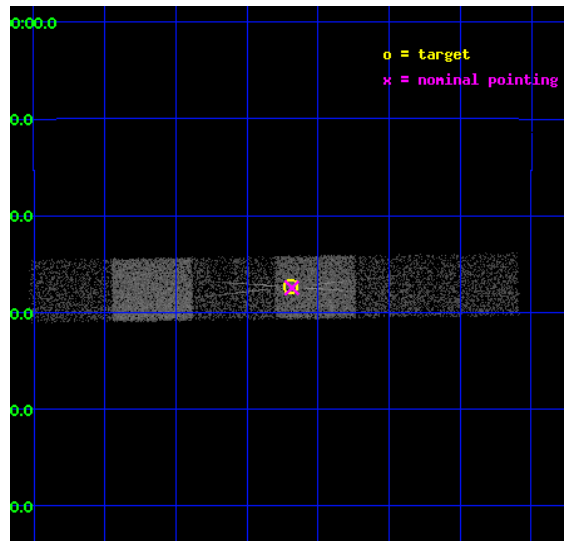
L2 Processing Date : Nov 14 2012

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# 1 Front

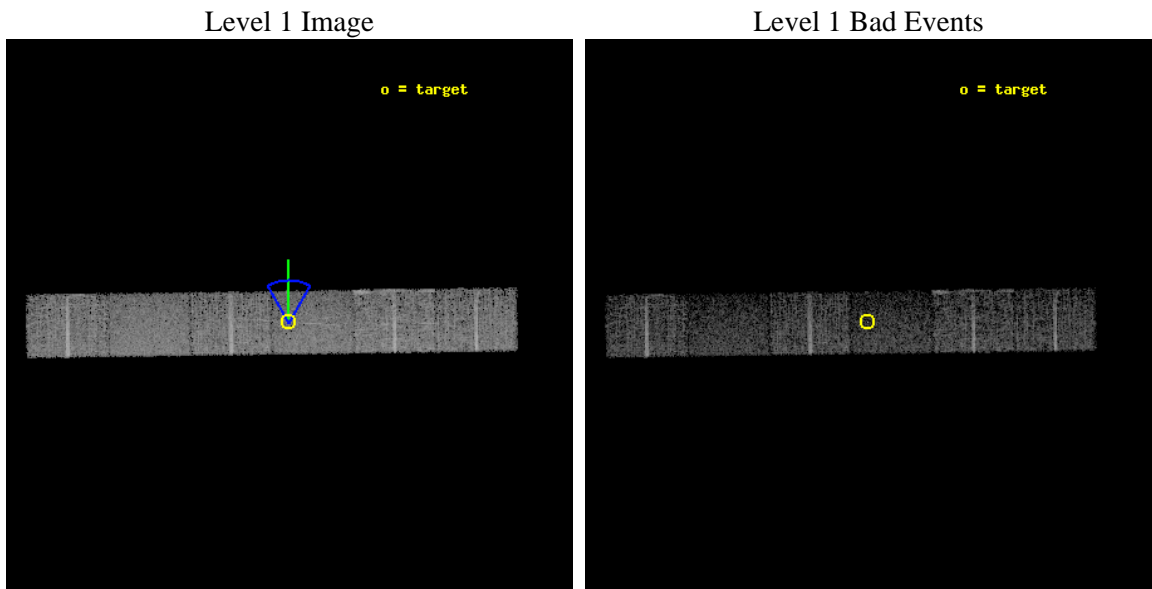
seq_num	700582	Sequence number
obs_id	3143	Observation id
title	PROBING UNIFICATION WITH ACIS-HETG OBSERVATION OF COMPTON-THIN SEYFERT 2 NGC 2110	Proposal title
observer	Prof. Julia Lee	Principal investigator
object	NGC2110	Source name
dtcycle	0	&#160
cycle	P	events are from which exps? P[primary] S[econdar]
ra_targ	88.0475	Observer's specified target RA [deg]
dec_targ	-7.456111	Observer's specified target Dec [deg]
ra_nom	88.046032168979	Nominal RA [deg]
dec_nom	-7.4577766481157	Nominal Dec [deg]
roll_nom	359.15644271824	Nominal Roll [deg]
revision	4	Processing version of data
ontime	8606.3943116069	Sum of GTIs [s]
livetime	2087.1196259573	Livetime [s]
ontime4	8606.4353317022	Sum of GTIs [s]
ontime5	8606.3532516956	Sum of GTIs [s]
ontime6	8606.3122117072	Sum of GTIs [s]
ontime7	8606.3943116069	Sum of GTIs [s]
ontime8	8606.2711916119	Sum of GTIs [s]
ontime9	8599.6324316114	Sum of GTIs [s]
l2events	24268	Number of level 2 events



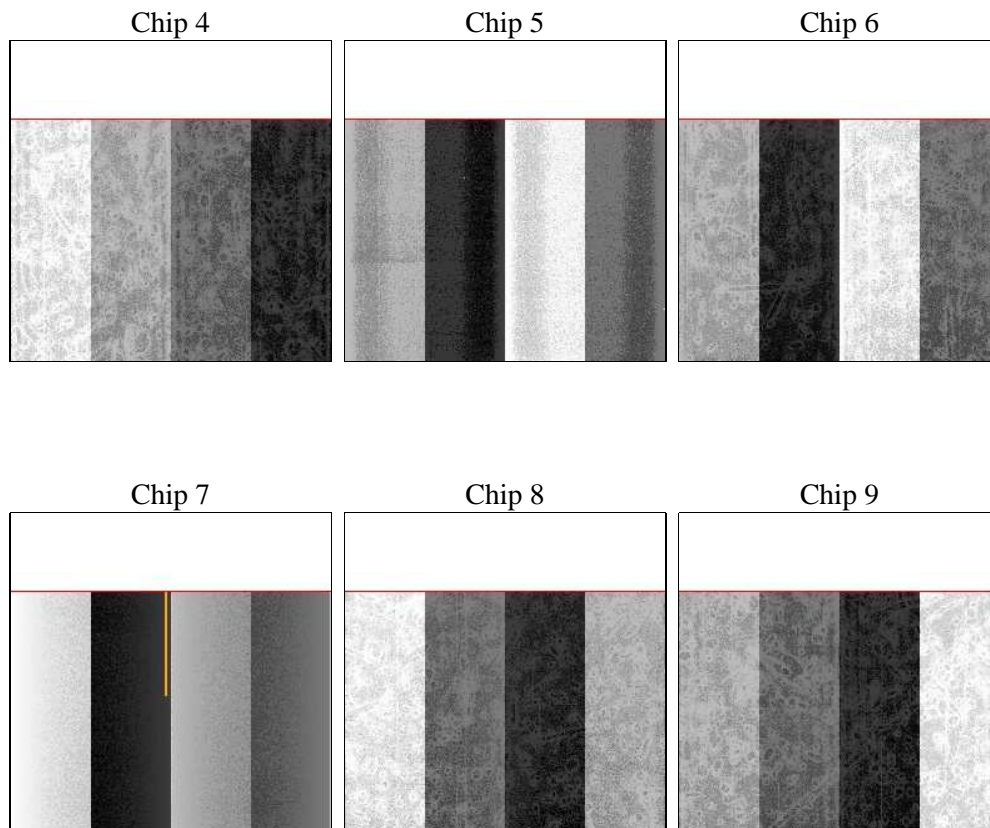
## 2 OBI Primary

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	33830.248000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	8606.3943116069	Sum of GTIs [s]
caldbver	4.5.2	&#160	ontime4	8606.4353317022	Sum of GTIs [s]
date	2012-09-29T03:23:57	Date and time of file creation	ontime5	8606.3532516956	Sum of GTIs [s]
revision	4	Processing version of data	ontime6	8606.3122117072	Sum of GTIs [s]
			ontime7	8606.3943116069	Sum of GTIs [s]
			ontime8	8606.2711916119	Sum of GTIs [s]
			ontime9	8599.6324316114	Sum of GTIs [s]
			l1events	150211	Number of level 1 events

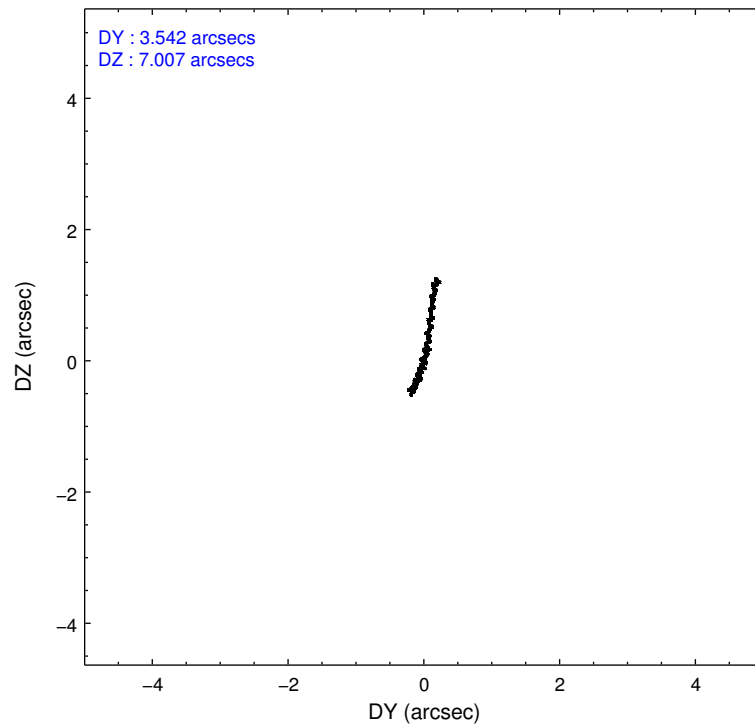
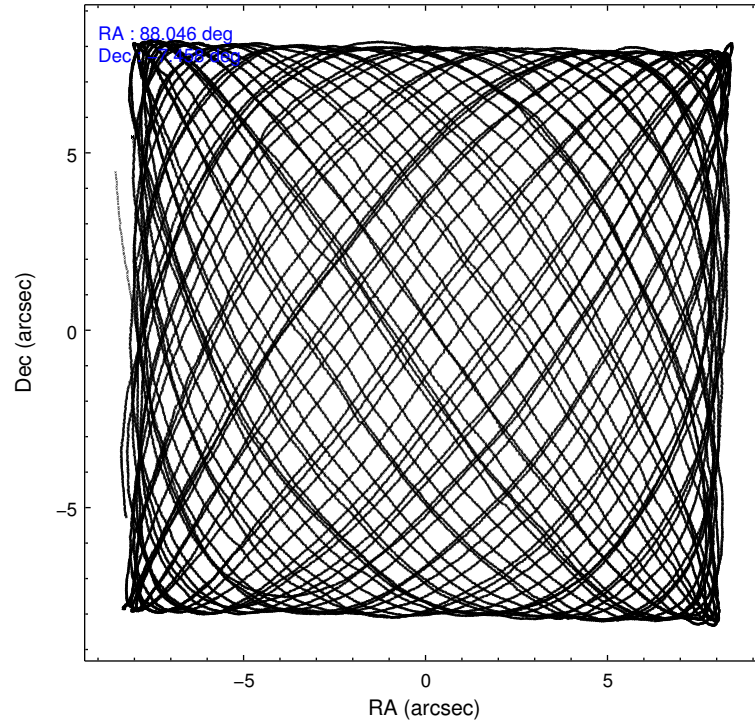
### 2.1.4 Events

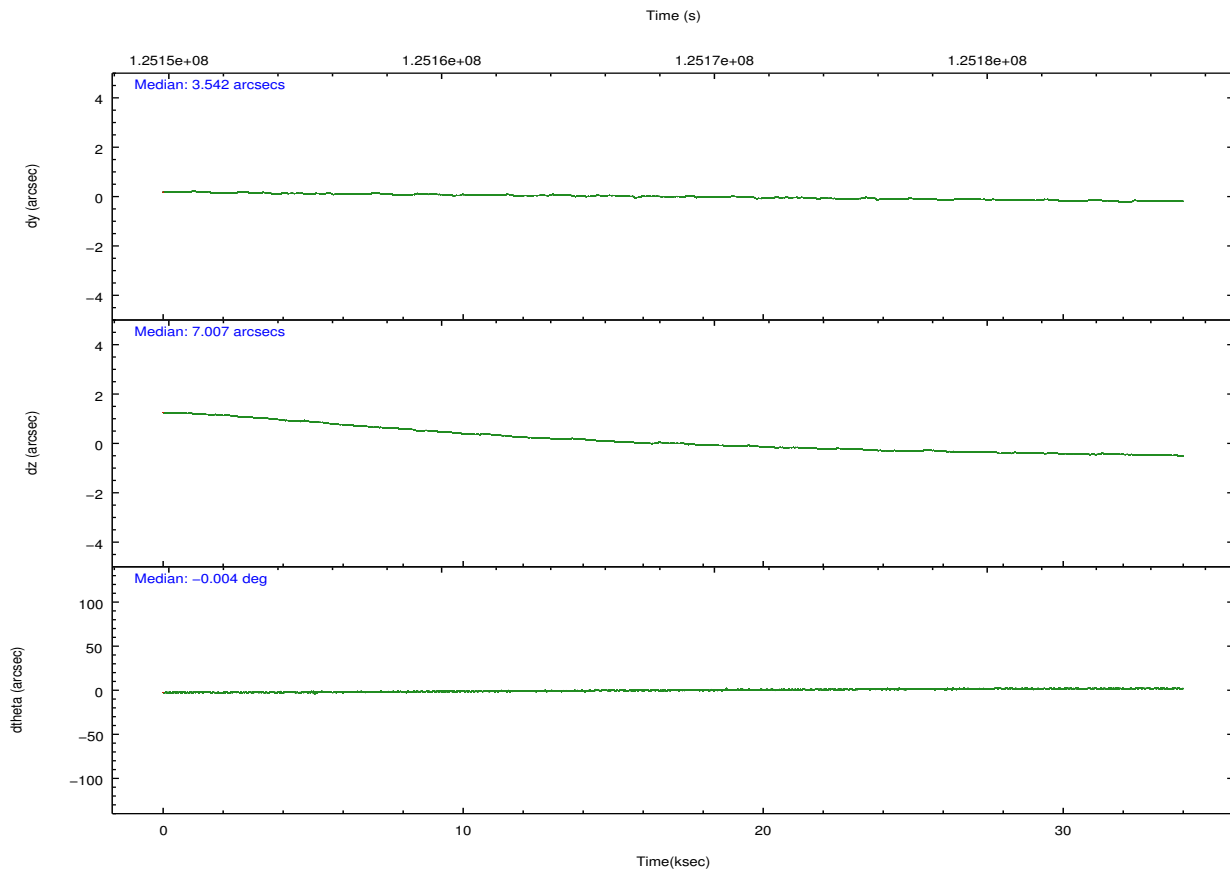
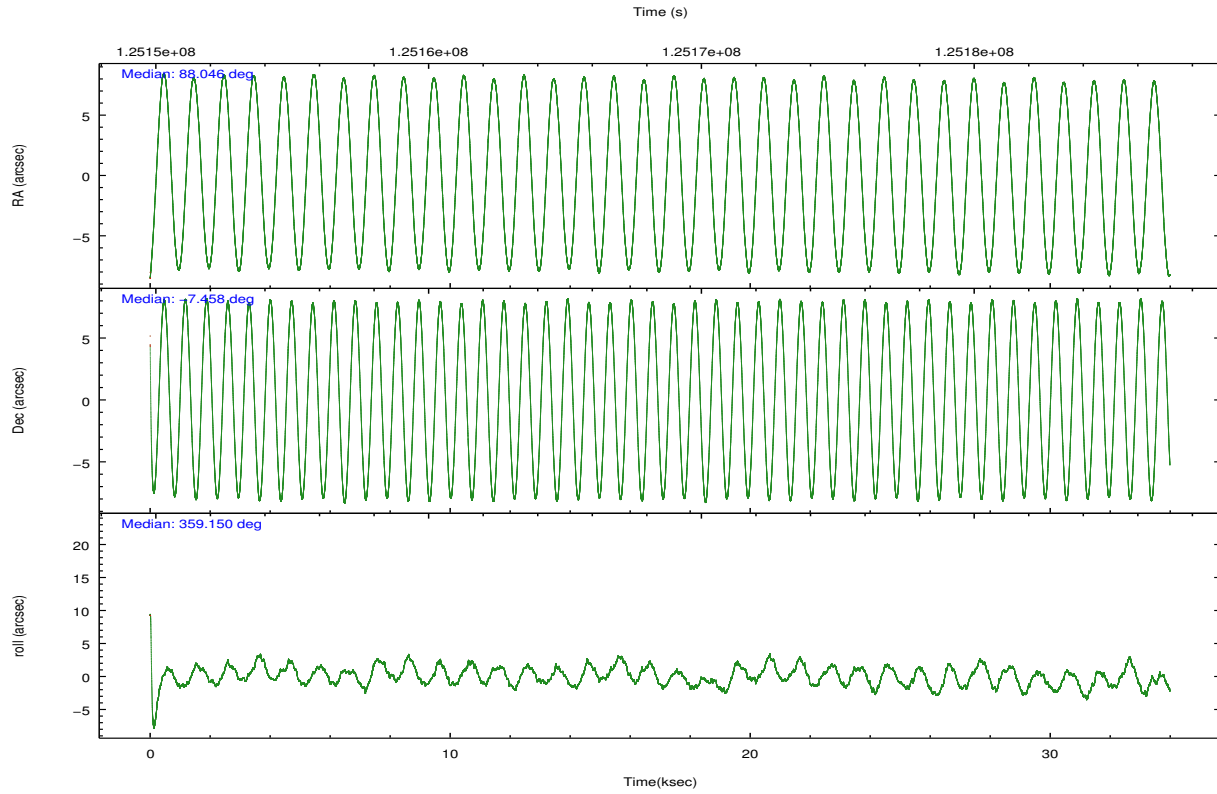
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	25794	23389	25736	23518	28717	23057	grade 0 events	696	606	949	929	1183	688
rejected events	23602	14475	23239	14911	24459	21026		2%	2%	3%	3%	4%	2%
rejected %	91%	61%	90%	63%	85%	91%	grade 1 events	6	15	10	35	7	5
								0%	0%	0%	0%	0%	0%
							grade 2 events	547	2456	501	1891	914	447
								2%	10%	1%	8%	3%	1%
							grade 3 events	284	503	309	890	474	270
								1%	2%	1%	3%	1%	1%
							grade 4 events	277	476	337	852	452	283
								1%	2%	1%	3%	1%	1%
							grade 5 events	662	1790	758	1880	918	768
								2%	7%	2%	7%	3%	3%
							grade 6 events	400	4915	412	4094	1250	357
								1%	21%	1%	17%	4%	1%
							grade 7 events	22922	12628	22460	12947	23519	20239
								88%	53%	87%	55%	81%	87%

## 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	88.022184	88.04603216897938	Subarray requested	CUSTOM	CUSTOM
[deg] Pointing Dec	-7.471345	-7.457776648115725	Subarray start row	1	1
[deg] Pointing Roll	358.996706	359.1564427182404	Subarray row count	774	774
[deg] Roll angle	0.000000	0.000000	Alternating exposures requested	Y	Y
[deg] Roll tolerance	30.000000	30.000000	[s] Primary exposure time	0.800000	0.8
Roll constraint allows 180D rotation	N	N	[s] Secondary exposure time	0.000000	3.2
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Duty cycle	3	3
[mm] SIM defocus	0	0.001444936568705701			
[mm] SIM translation stage pos	-187.132523	-187.1254020033014			
[mm] SIM translation stage offset	-3	-3.007120579706367			
[s] Observation start time (MET)	125151649.184000	125150550.81853			
Observation start date	2001-12-19T12:19:45	2001-12-19T12:02:30			
[s] Observation end time (MET)	125185479.184000	125185793.39494			
Observation end date	2001-12-19T21:43:35	2001-12-19T21:49:53			
Read mode	TIMED	TIMED			

## 2.3 Aspect



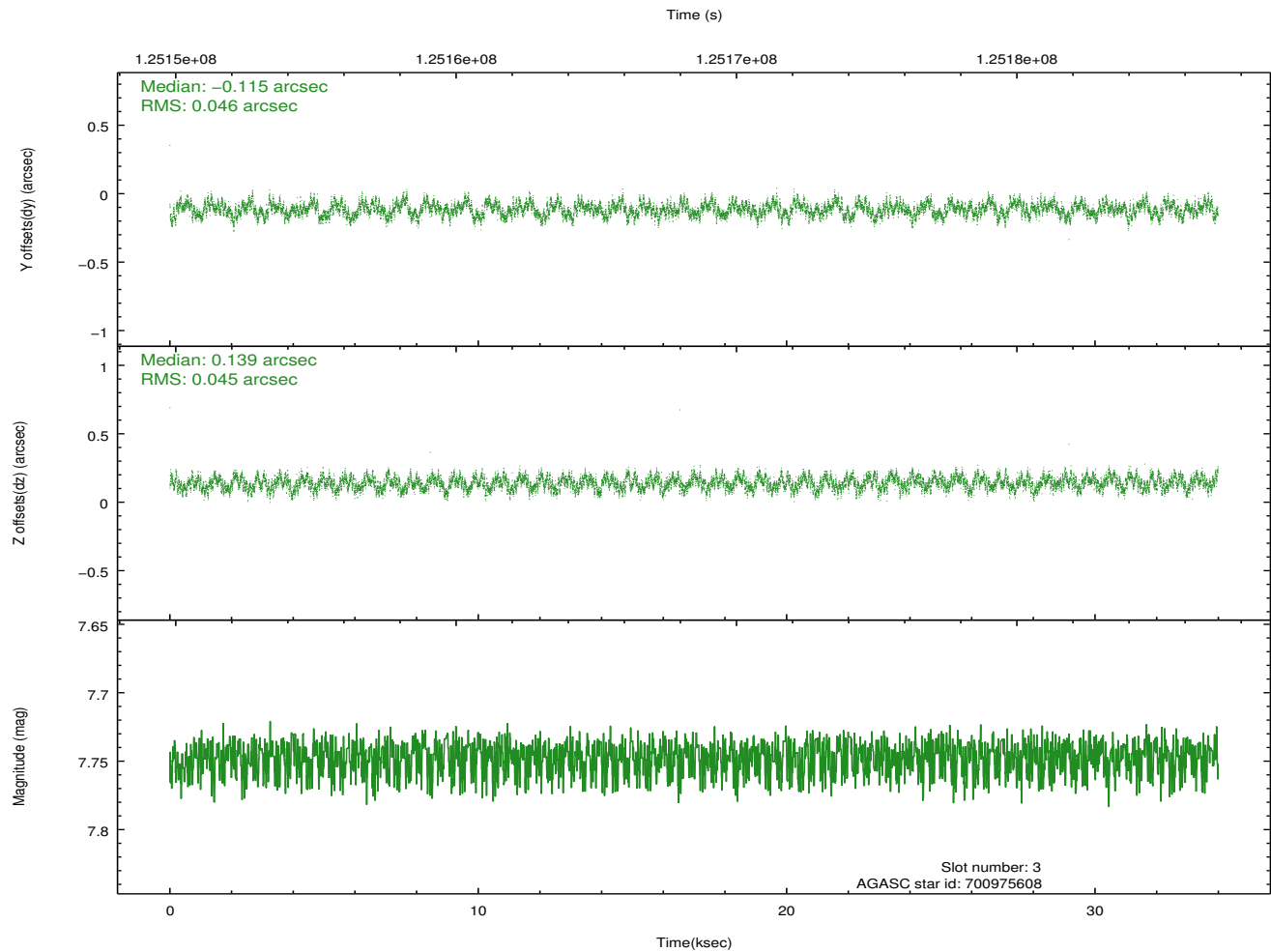
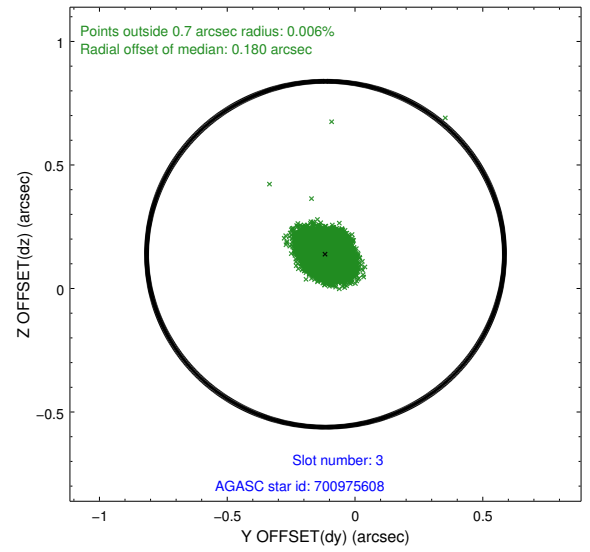
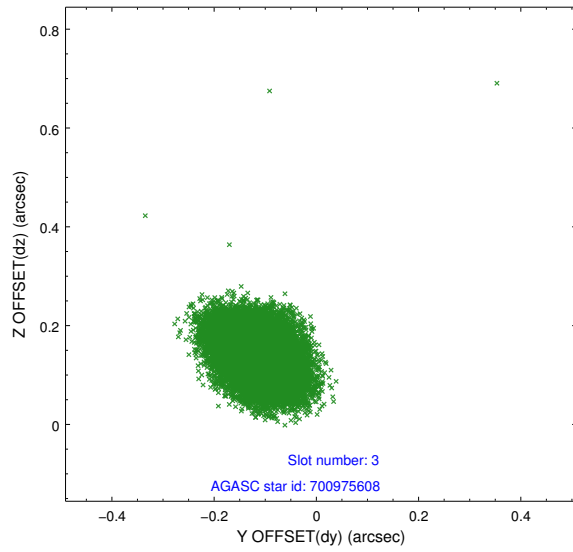


### Slot Statistics

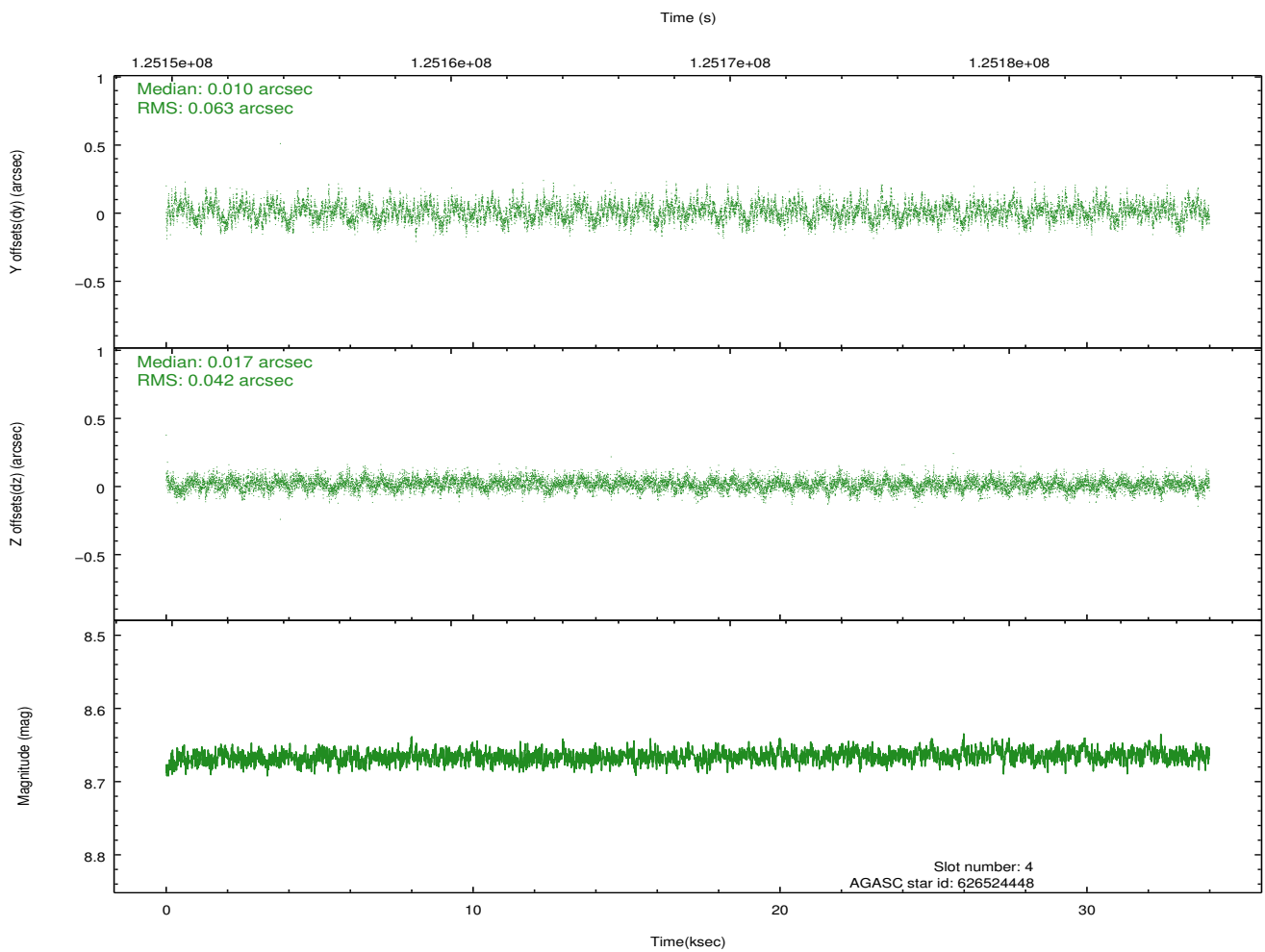
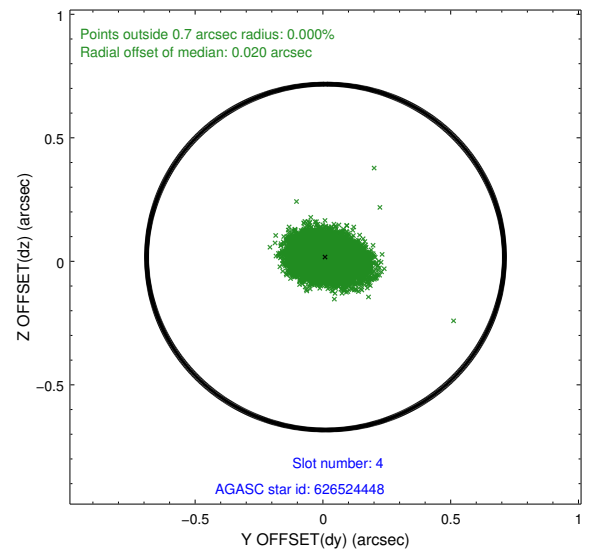
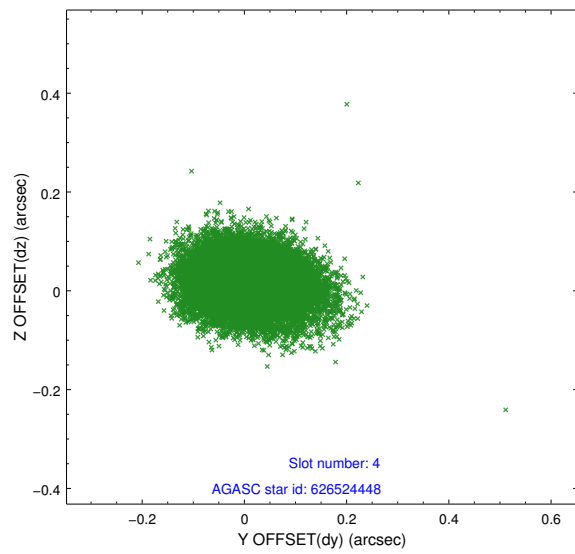
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.10	8289	-0.044	-0.050	0.016	0.030	0.000000	0.000000	-756.02	-1790.46
1	FID	ACIS-S-4	7.20	8286	0.028	0.034	0.011	0.018	0.000000	0.000000	2157.30	118.07
2	FID	ACIS-S-5	7.24	8287	-0.013	0.024	0.015	0.027	0.000000	0.000000	-1808.78	111.75
3	GUIDE	700975608	7.75	16573	-0.115	0.139	0.069	0.108	88.344260	-8.111712	1188.31	-2285.38
4	GUIDE	626524448	8.67	16575	0.010	0.017	0.080	0.133	87.380980	-6.987266	-2321.33	1700.01
5	GUIDE	700844704	8.71	16576	0.102	-0.020	0.086	0.137	87.931803	-7.921073	-293.71	-1624.73
6	GUIDE	626527888	9.39	16567	0.017	-0.127	0.103	0.167	87.940640	-6.806336	-333.65	2387.94
7	GUIDE	626656280	9.52	16563	-0.016	-0.008	0.142	0.229	88.685870	-7.378153	2363.23	375.22

## 2.4 Star Slots

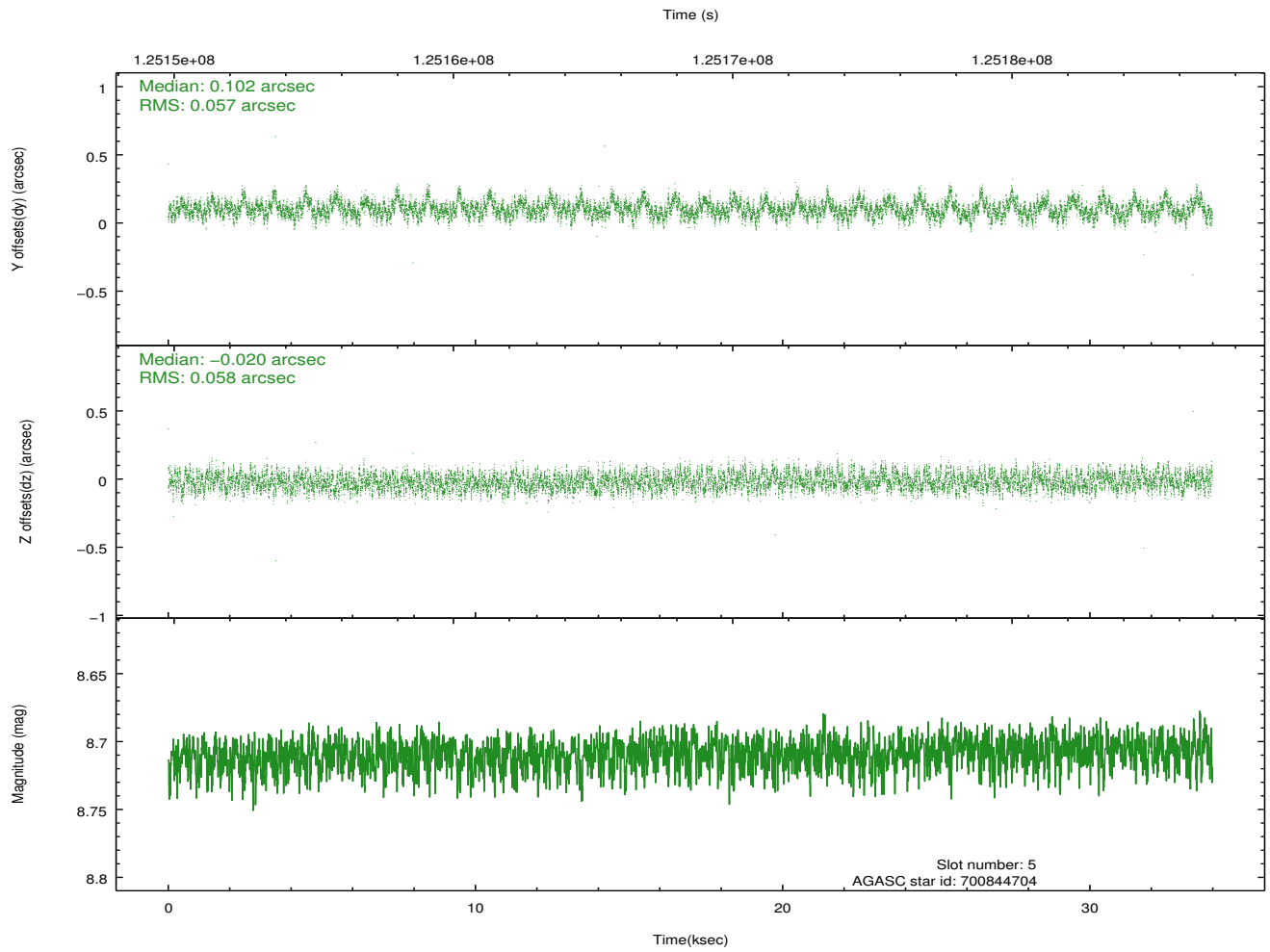
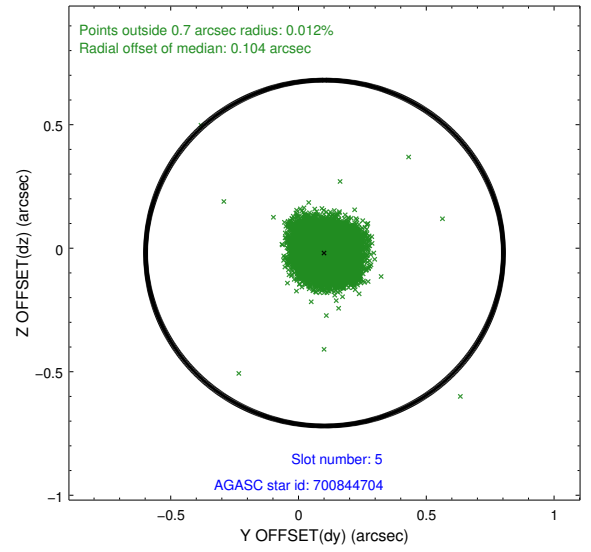
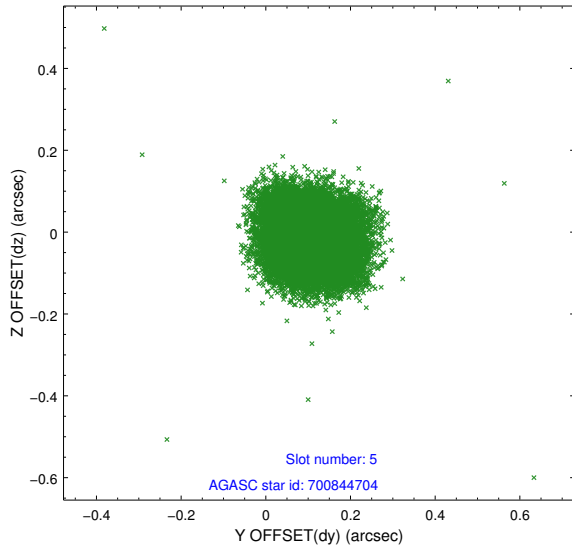
### 2.4.1 Slot 3



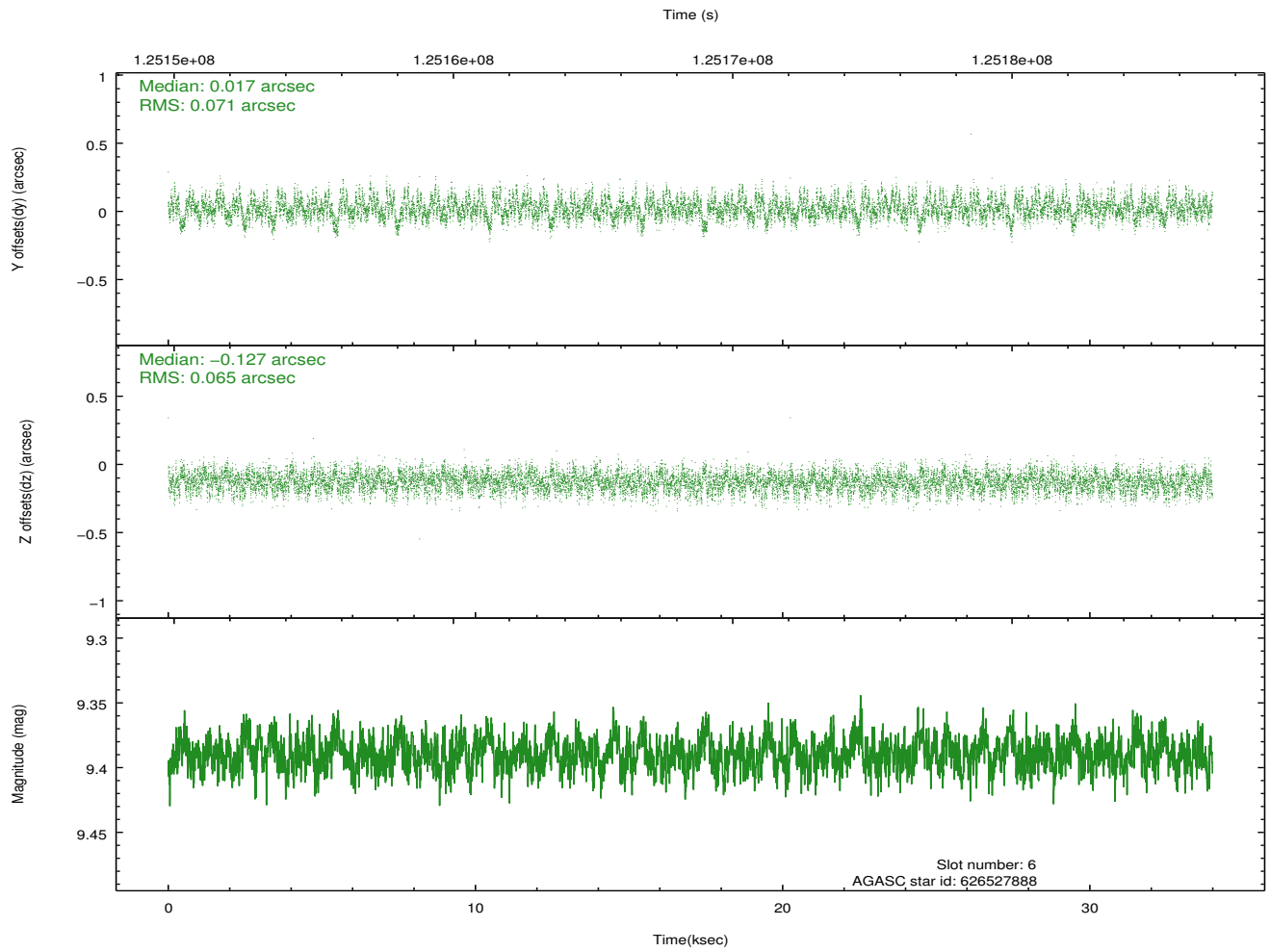
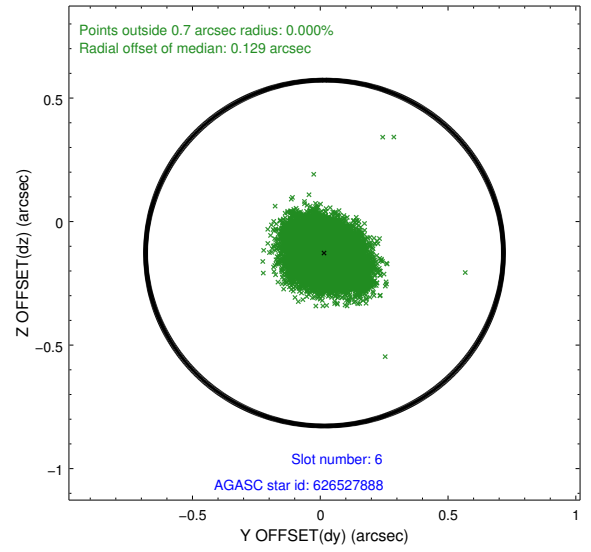
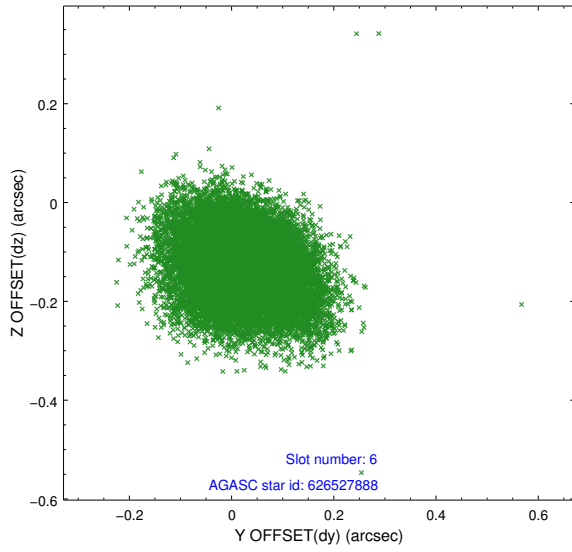
## 2.4.2 Slot 4



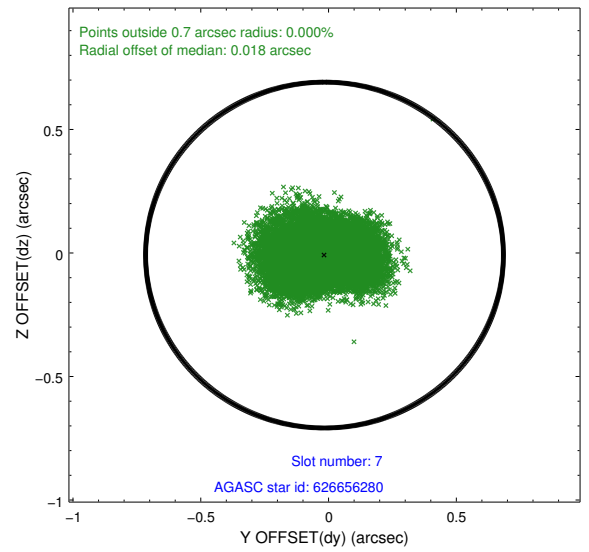
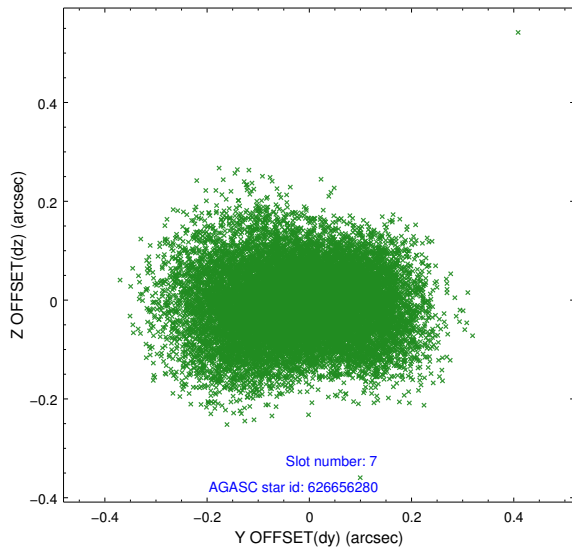
### 2.4.3 Slot 5



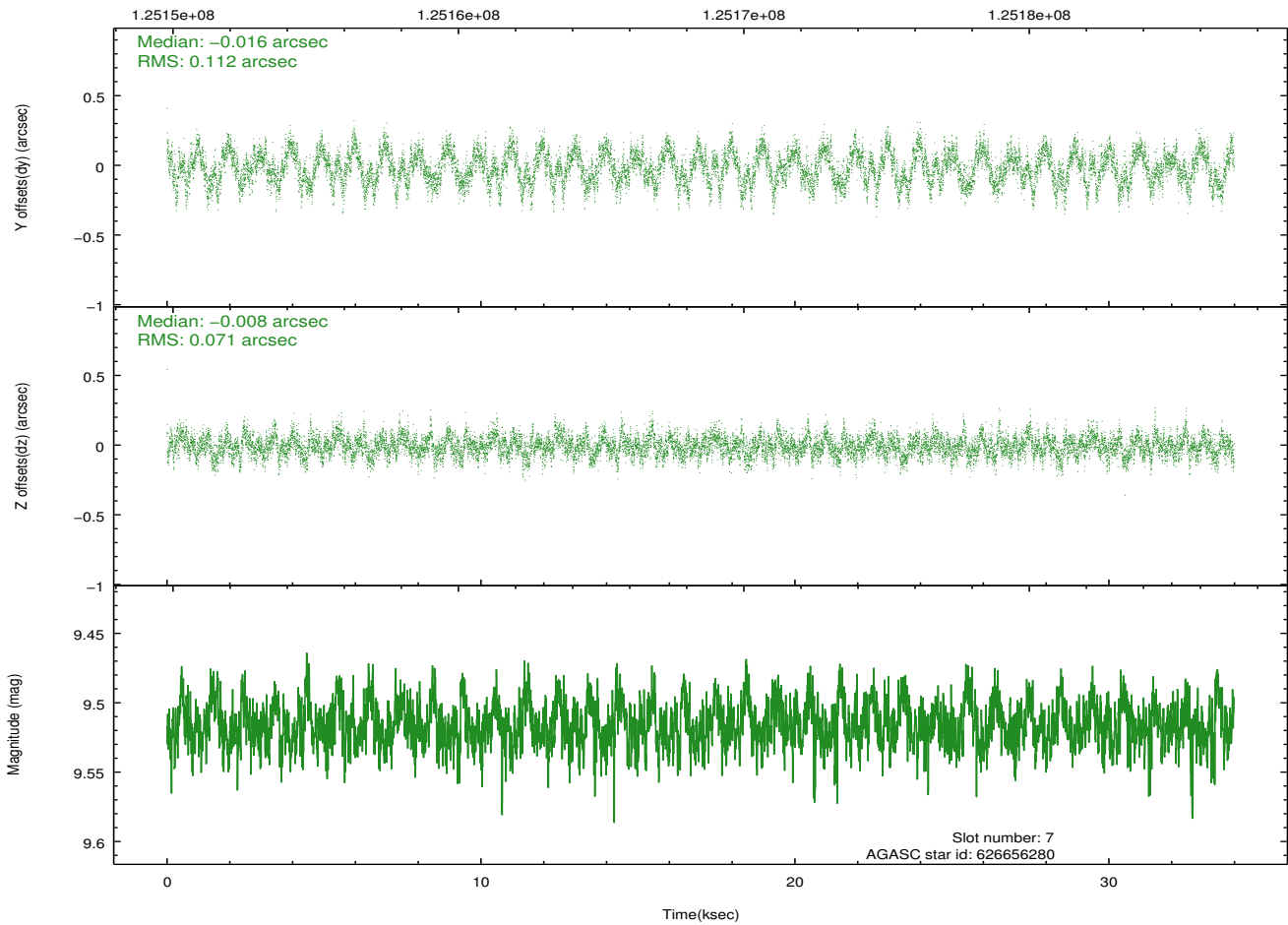
### 2.4.4 Slot 6



## 2.4.5 Slot 7

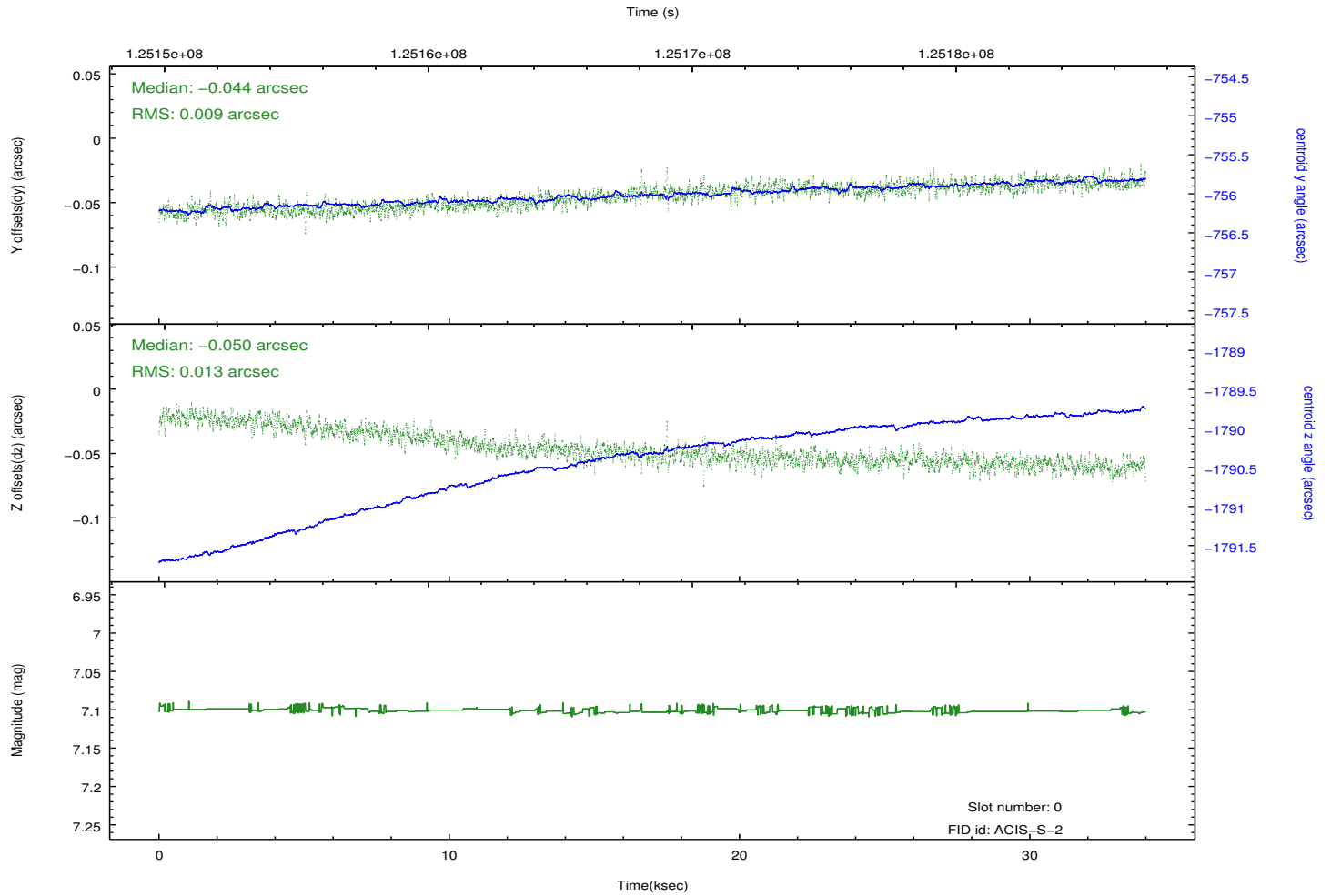
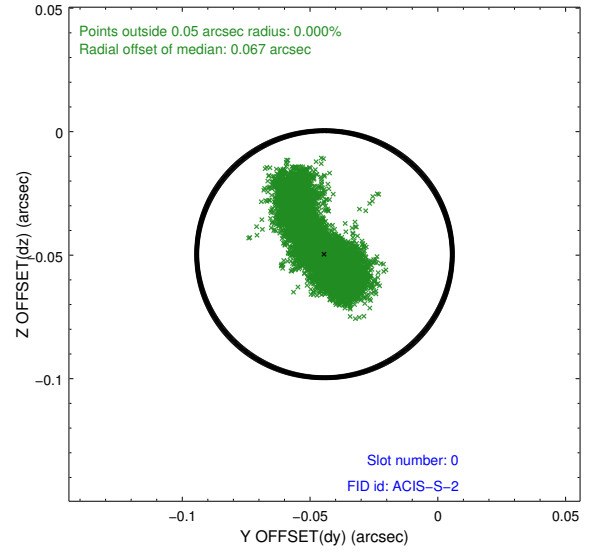
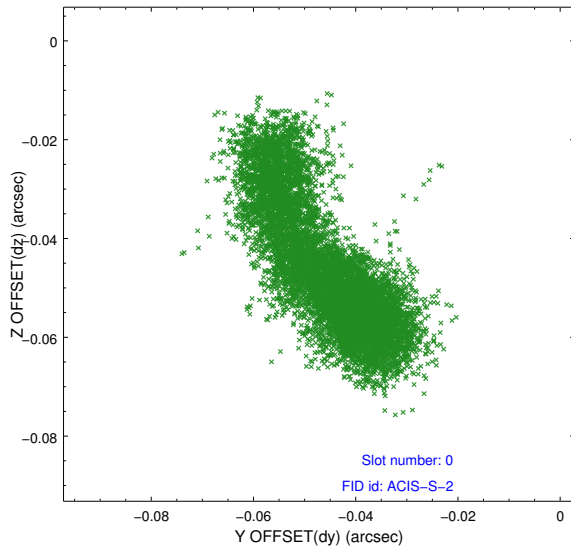


Time (s)

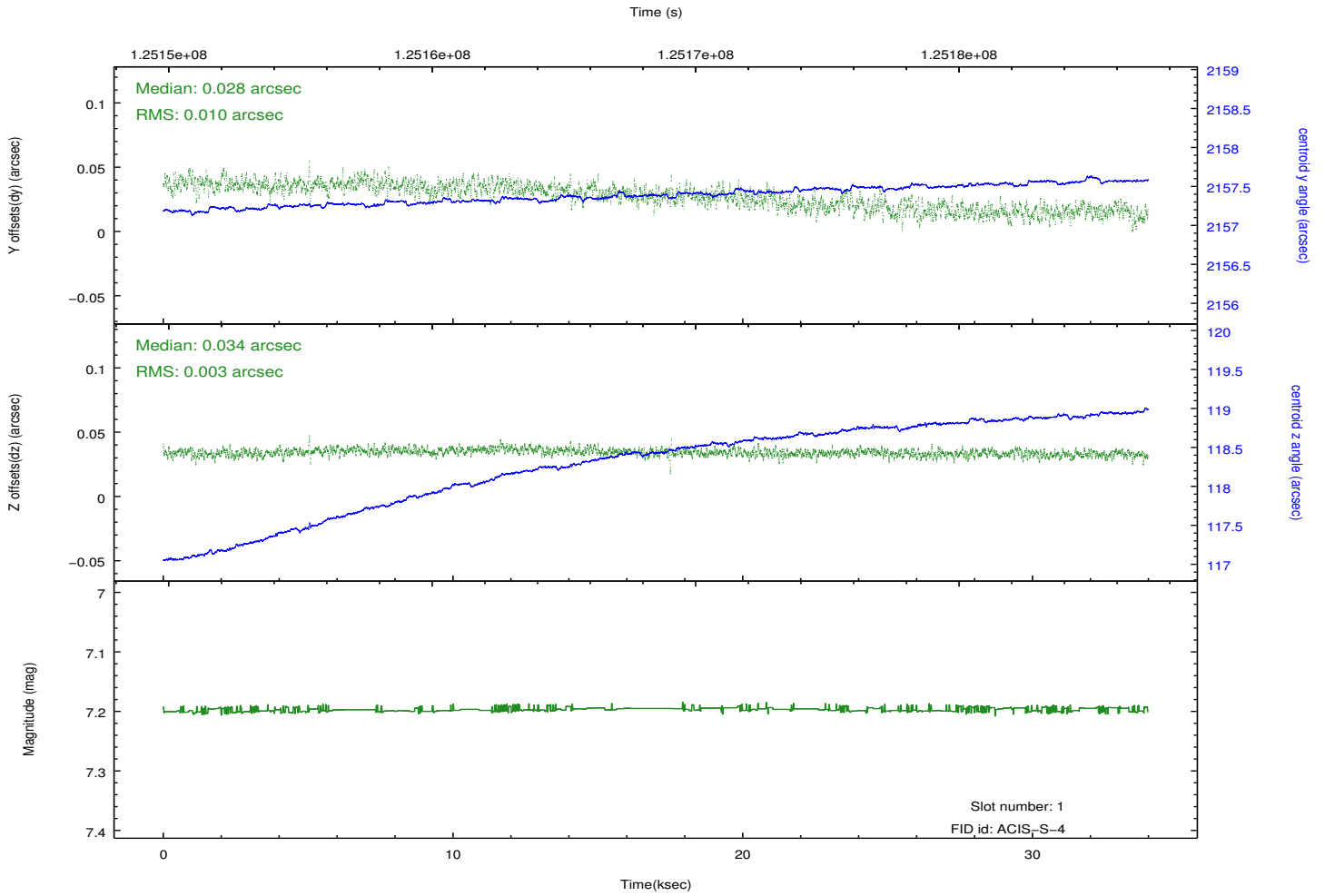
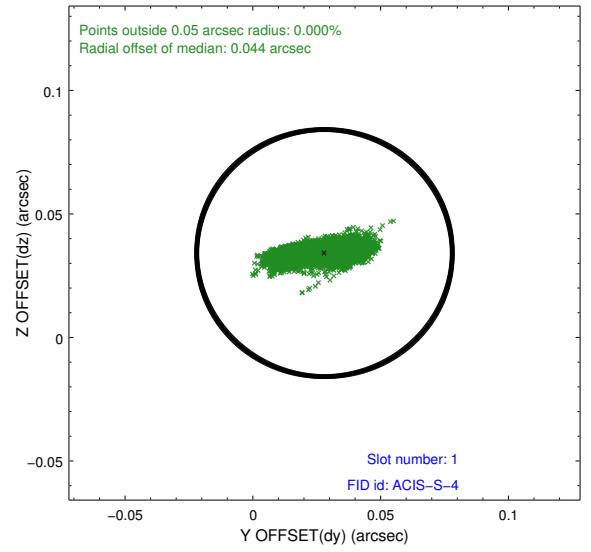
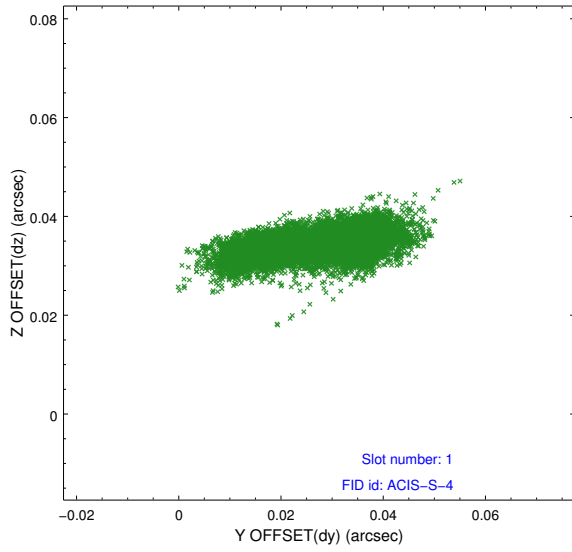


## 2.5 FID Slots

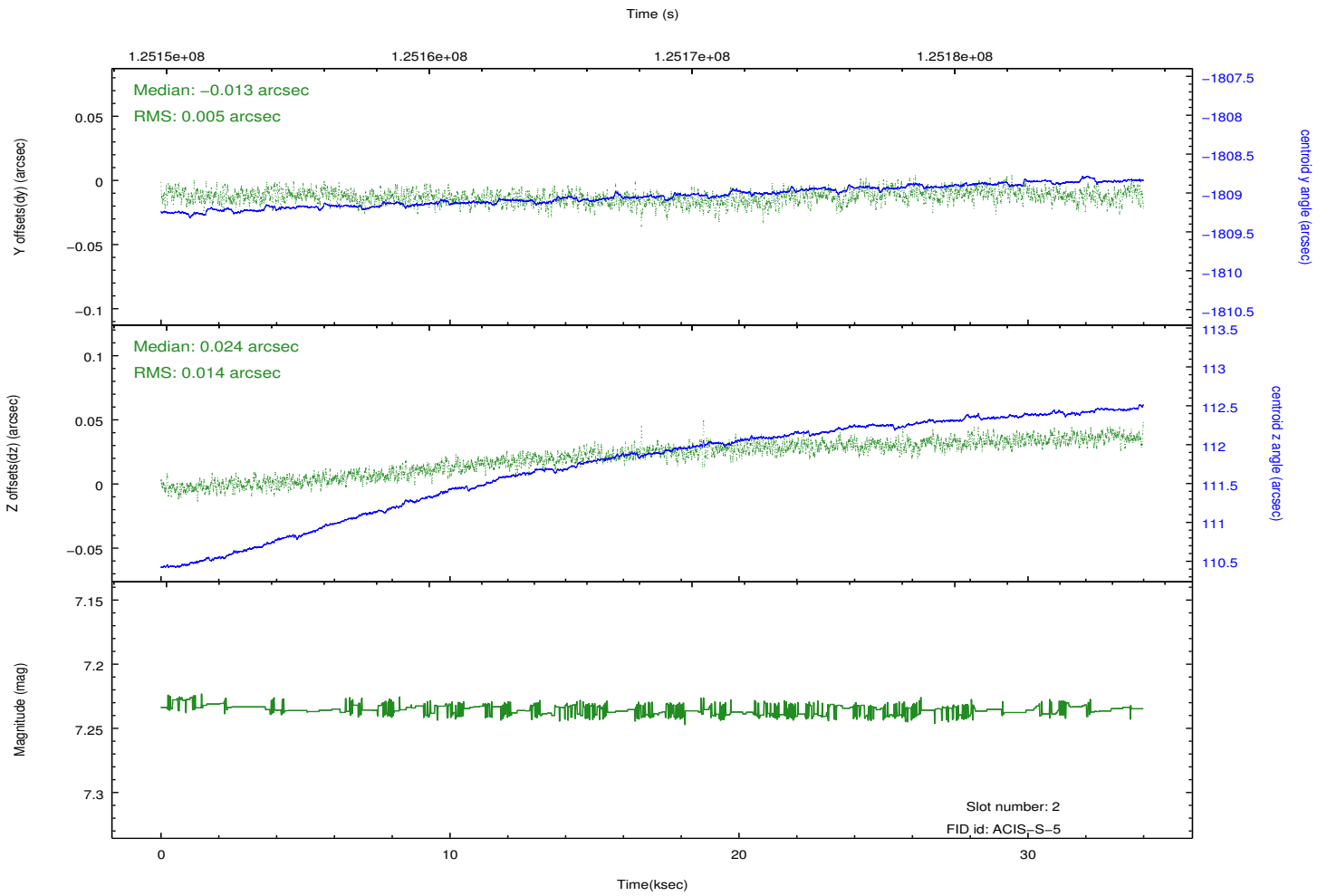
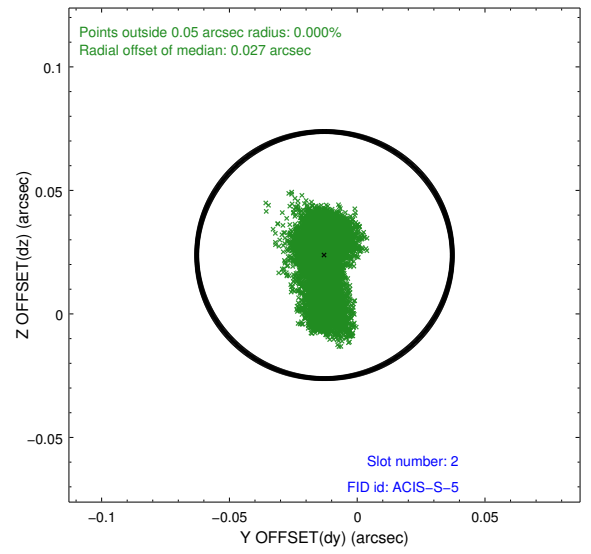
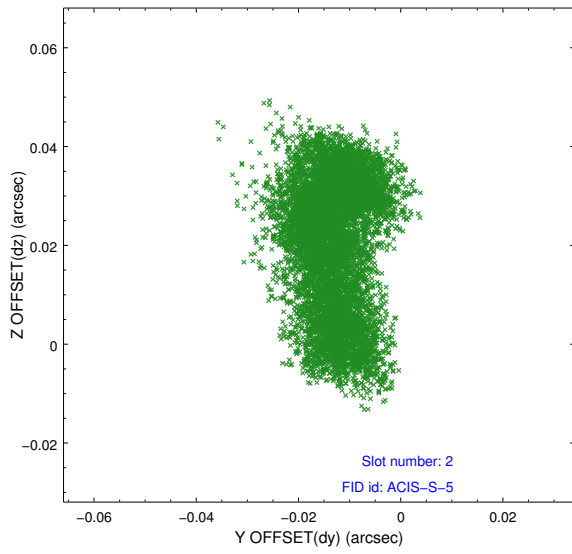
### 2.5.1 Slot 0



## 2.5.2 Slot 1



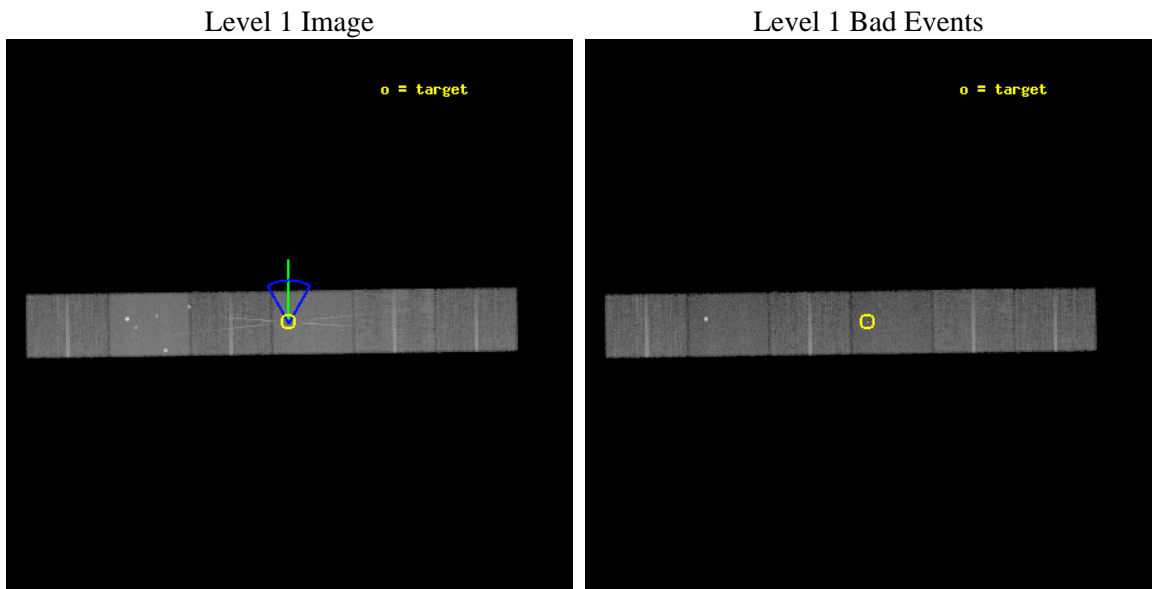
### 2.5.3 Slot 2



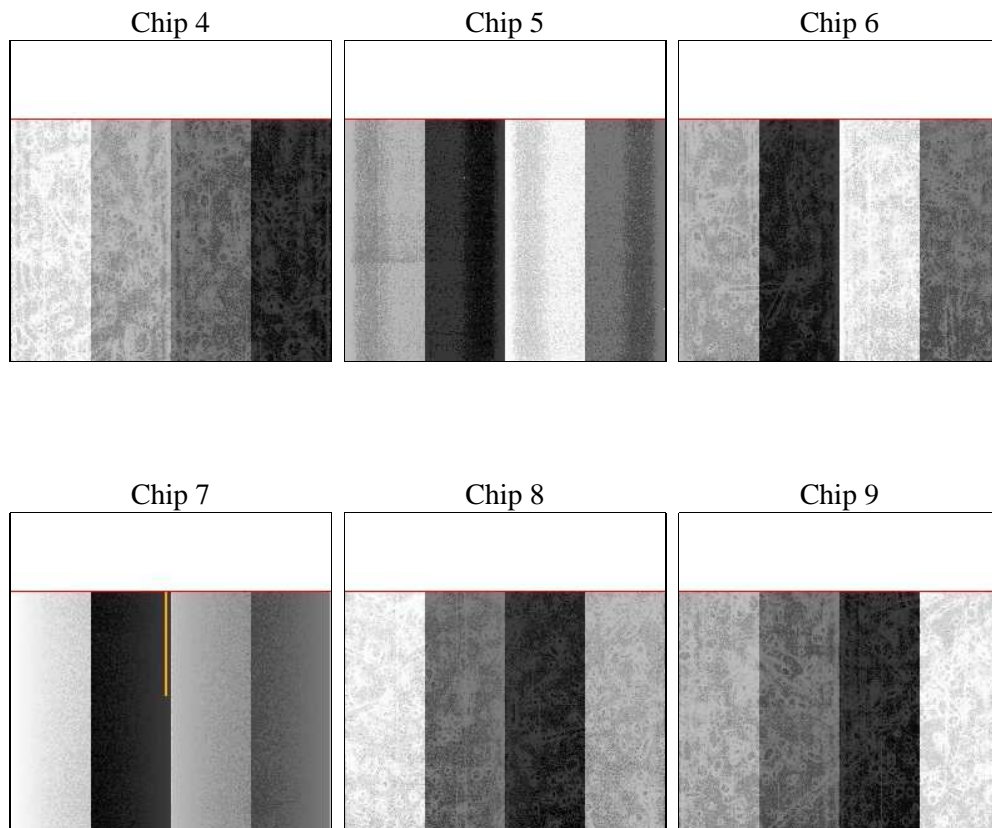
### 3 OBI Secondary

#### 3.1 OBI

##### 3.1.1 Images



##### 3.1.2 Bias



### 3.1.3 Parameters

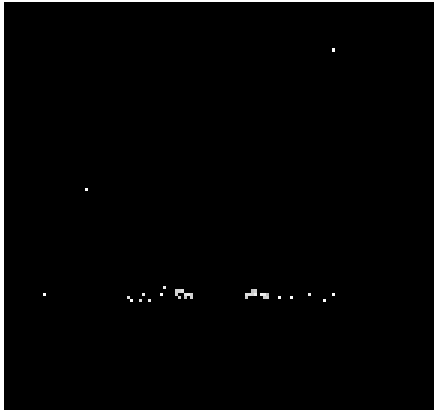
obi_num	0	Obi number	sched_exp_time	33830.248000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	25373.462677047	Sum of GTIs [s]
caldbver	4.5.2	&#160	ontime4	25370.221238092	Sum of GTIs [s]
date	2012-09-29T03:29:59	Date and time of file creation	ontime5	25373.462985173	Sum of GTIs [s]
revision	4	Processing version of data	ontime6	25370.221746117	Sum of GTIs [s]
			ontime7	25373.462677047	Sum of GTIs [s]
			ontime8	25373.46215865	Sum of GTIs [s]
			ontime9	25366.981393561	Sum of GTIs [s]
			l1events	866509	Number of level 1 events

### 3.1.4 Events

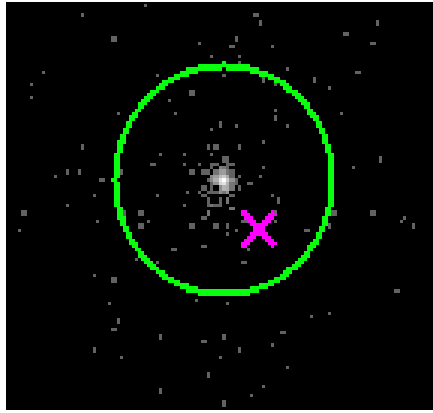
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	127690	184749	120420	168612	148428	116610	grade 0 events	6068	14305	9453	8088	11235	5994
rejected events	112774	96764	101234	90260	114470	101902		4%	7%	7%	4%	7%	5%
rejected %	88%	52%	84%	53%	77%	87%	grade 1 events	39	683	79	266	98	54
								0%	0%	0%	0%	0%	0%
							grade 2 events	3640	23782	3452	16411	7096	2896
								2%	12%	2%	9%	4%	2%
							grade 3 events	1396	5029	1639	7400	3753	1459
								1%	2%	1%	4%	2%	1%
							grade 4 events	1327	4274	1665	7259	3484	1472
								1%	2%	1%	4%	2%	1%
							grade 5 events	4357	17569	4976	15783	6546	5190
								3%	9%	4%	9%	4%	4%
							grade 6 events	2555	41111	3103	39589	8531	2964
								2%	22%	2%	23%	5%	2%
							grade 7 events	108308	77996	96053	73816	107685	96581
								84%	42%	79%	43%	72%	82%

# 4 Gratings

## 4.1 HEG Arm



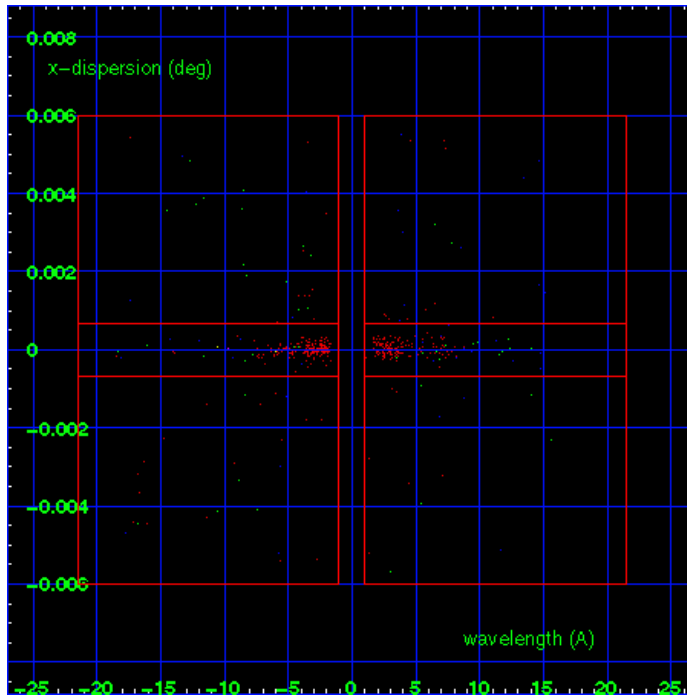
HEG Order Sort 123



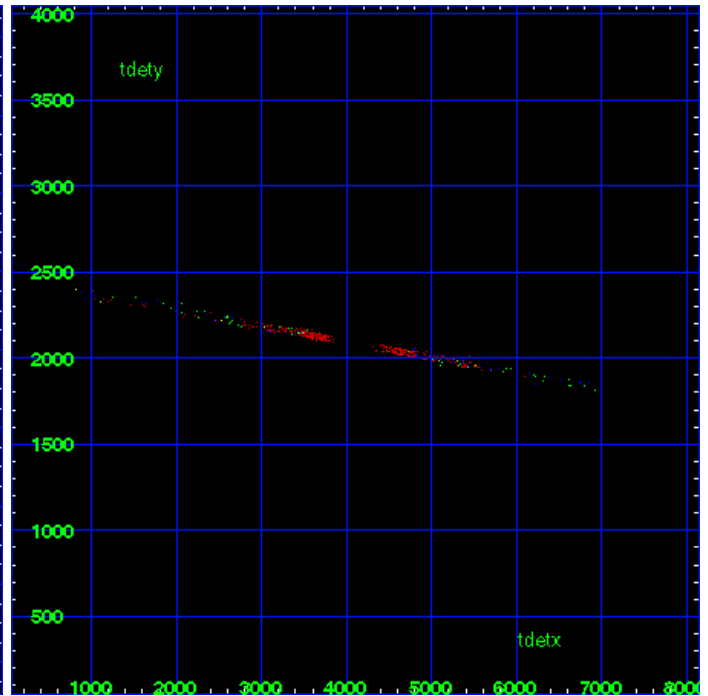
HEG Zero Order



HEG Order Sort ALL

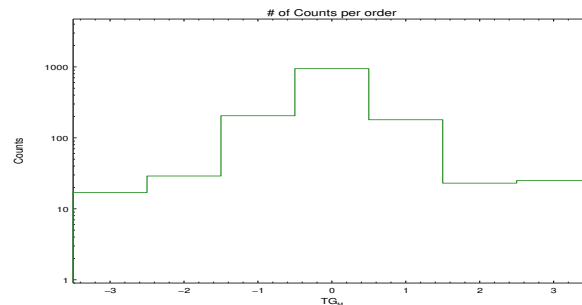


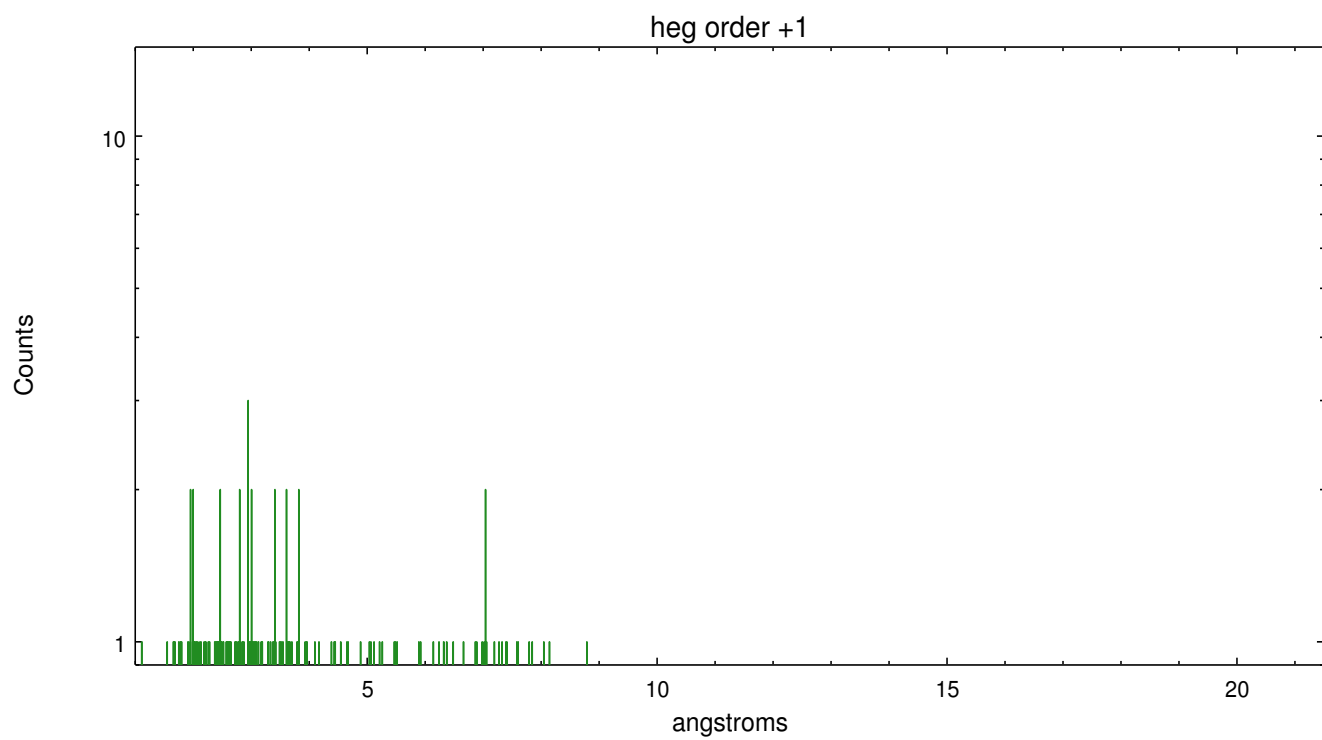
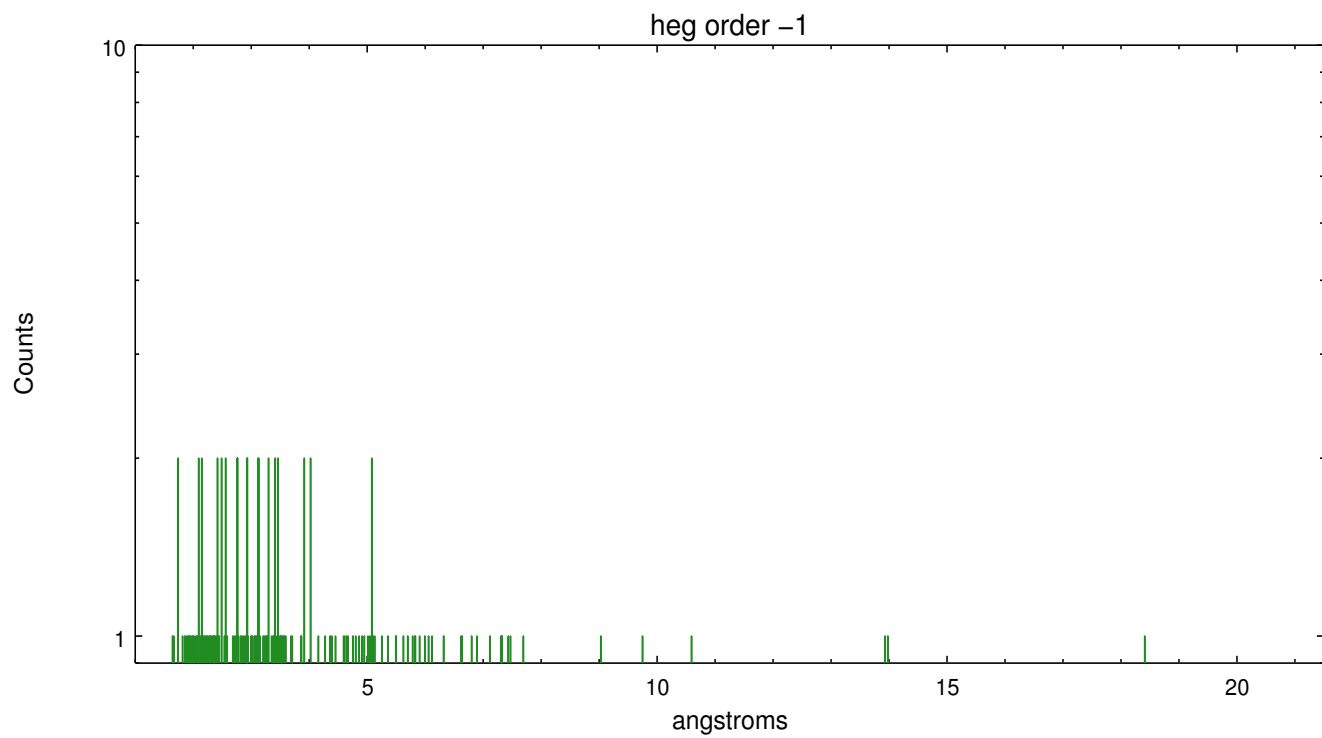
Spot Image HEG



Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	17	29	205	944	180	23	25

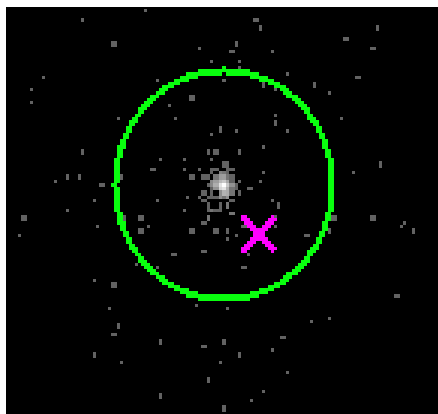




## 4.2 MEG Arm



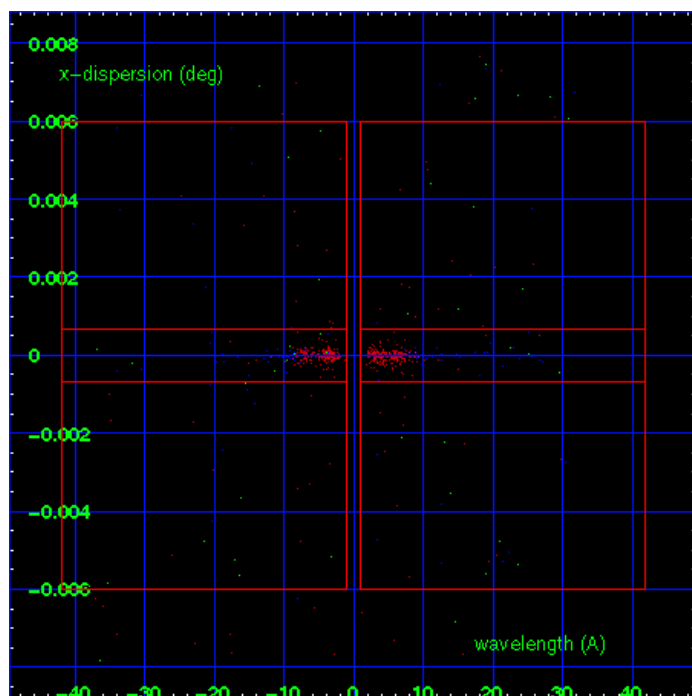
MEG Order Sort 123



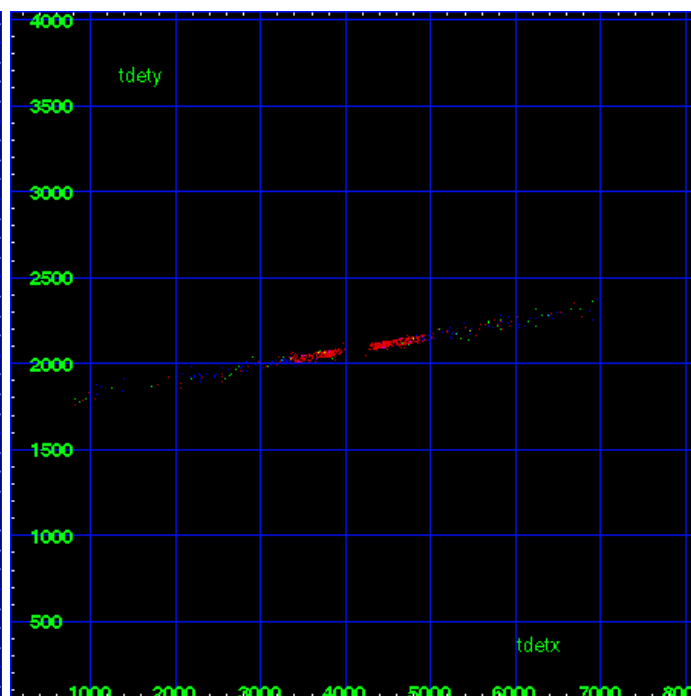
MEG Zero Order



MEG Order Sort ALL

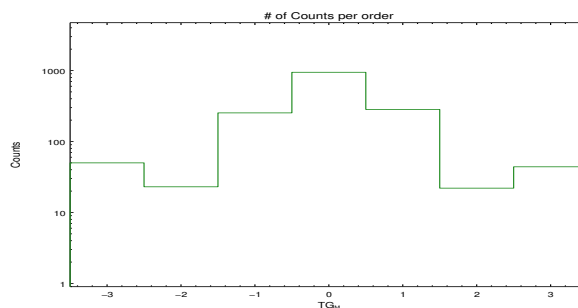


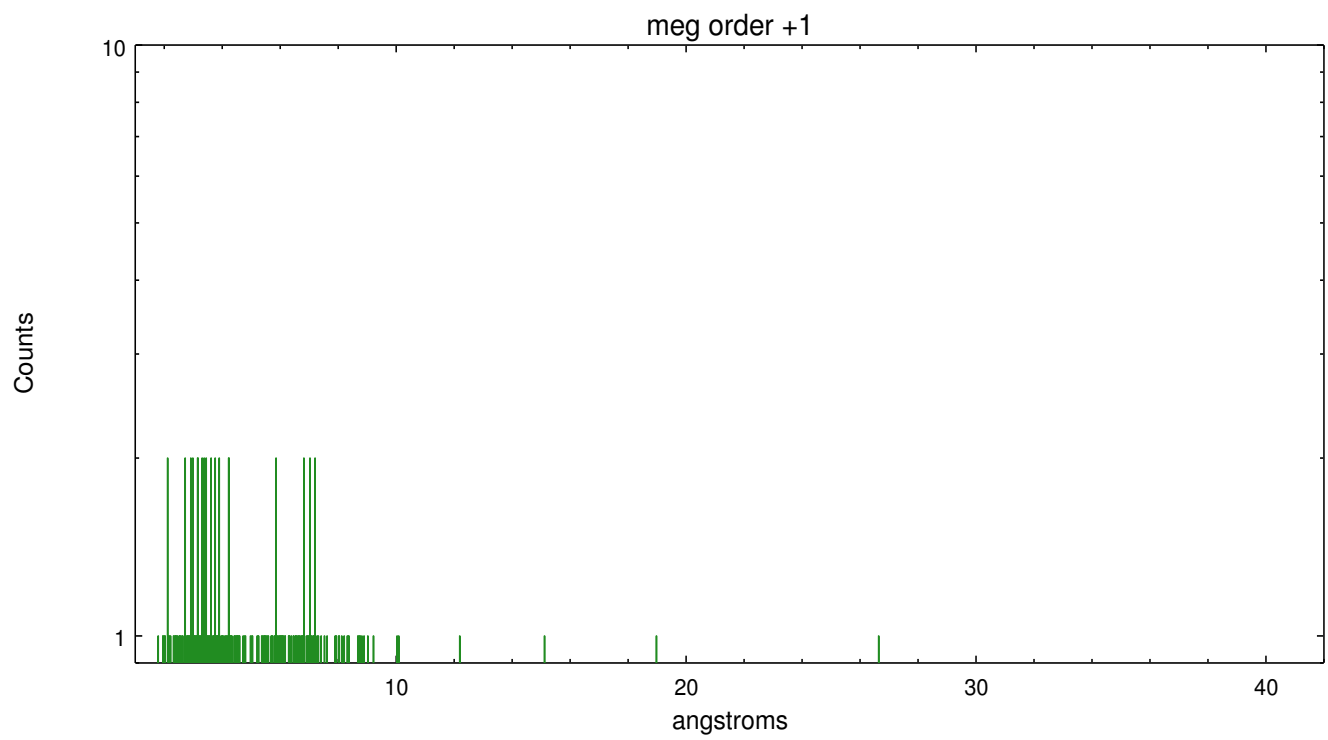
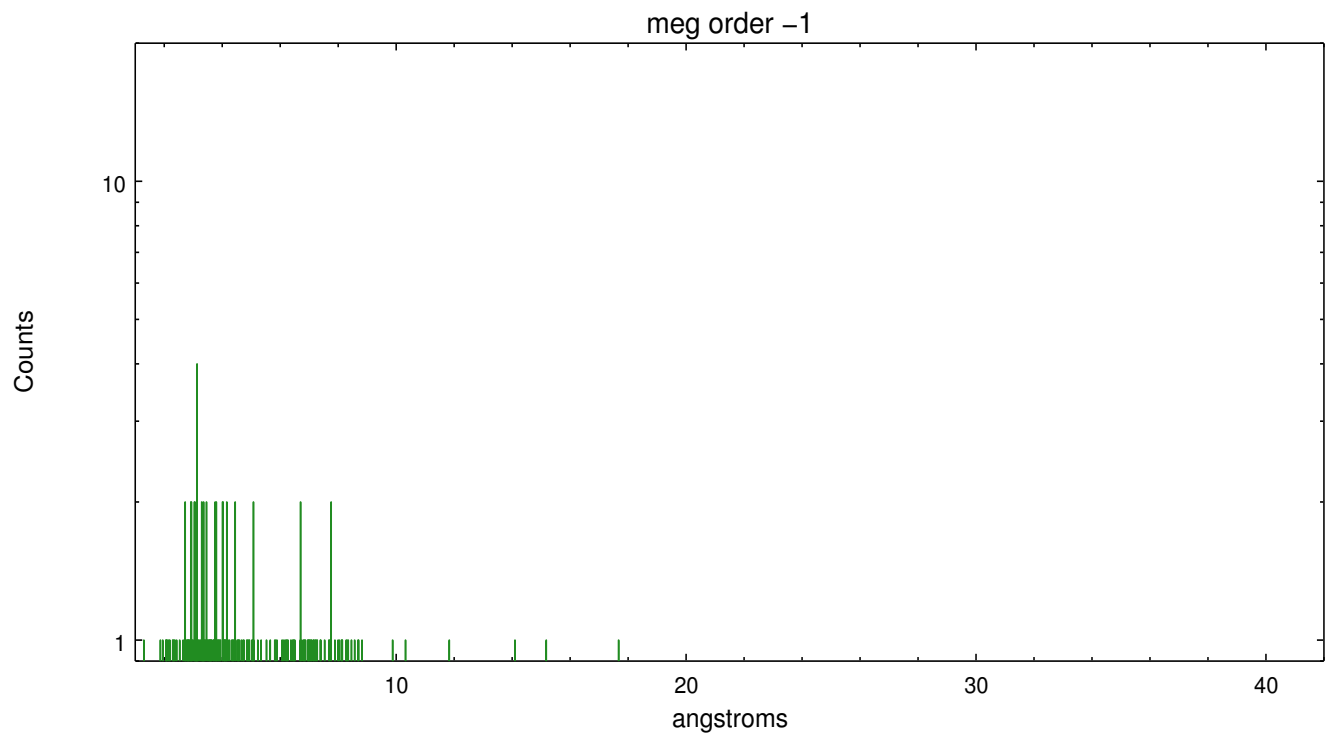
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	50	23	253	944	283	22	44





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.12.17
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	33.98

## A.2 Comments

This is an interleaved-mode observation. The primary exposure (e1) is shorter than the secondary exposure (e2). Therefore the longer exposure was used to determine the zeroth order position, then that position was applied to both exposures. The zeroth order position used is  $x=4086.66$ ,  $y=4107.44$ , the result obtained using the tool `tgdetect` on the e2 exposure.