

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 1714 - L2 Version 5  
Chandra X-Ray Center

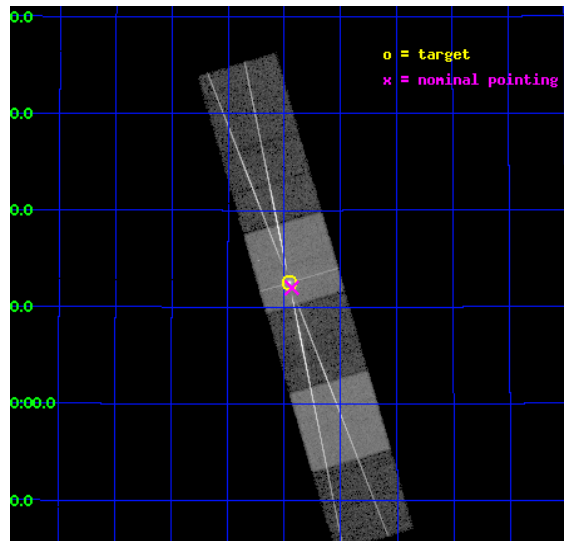
L2 Processing Date : Aug 28 2012

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# 1 Front

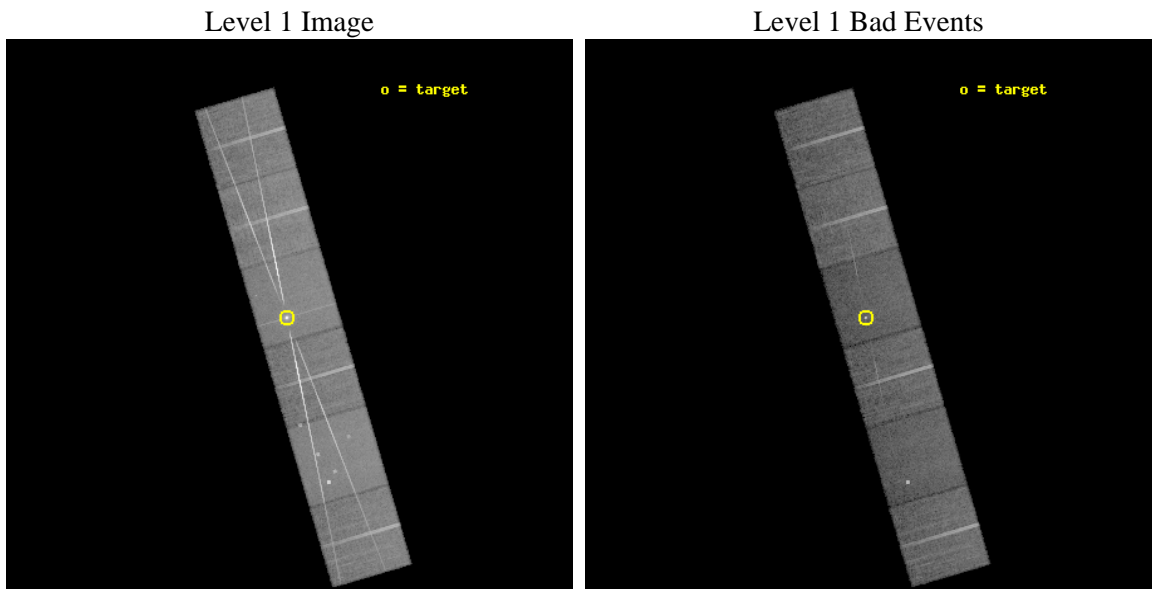
seq_num	700265	Sequence number
obs_id	1714	Observation id
title	X-RAYING THE BRIGHTEST AGN IN THE SKY WITH THE CHANDRA GRATINGS	Pr
observer	Dr Antonella Fruscione	Principal investigator
object	MRK 421	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.11375	Observer's specified target RA [deg]
dec_targ	38.208833	Observer's specified target Dec [deg]
ra_nom	166.10799580382	Nominal RA [deg]
dec_nom	38.199931573409	Nominal Dec [deg]
roll_nom	253.64813508706	Nominal Roll [deg]
revision	5	Processing version of data
ontime	19829.504414424	Sum of GTIs [s]
livetime	19578.411289635	Livetime [s]
ontime4	19829.545454428	Sum of GTIs [s]
ontime5	19829.463374421	Sum of GTIs [s]
ontime6	19829.422334433	Sum of GTIs [s]
ontime7	19829.504414424	Sum of GTIs [s]
ontime8	19829.381294429	Sum of GTIs [s]
ontime9	19829.340254426	Sum of GTIs [s]
l2events	425451	Number of level 2 events



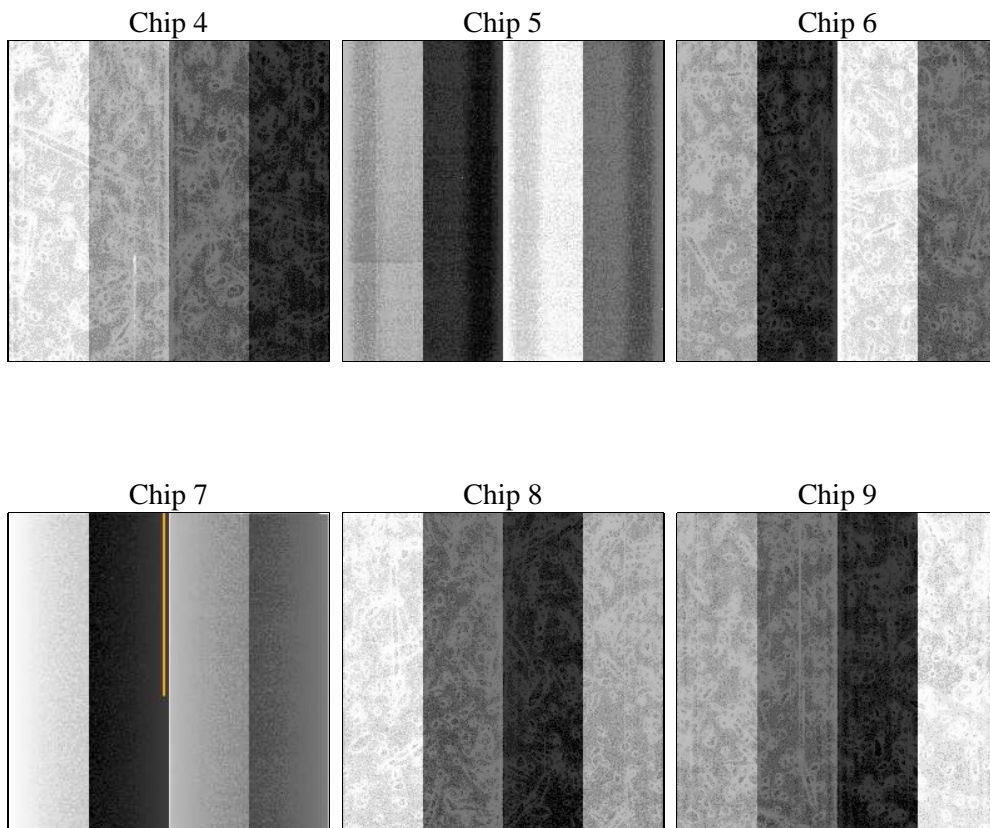
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	20000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	19829.504414424	Sum of GTIs [s]
caldbver	4.5.1.1	&#160	ontime4	19829.545454428	Sum of GTIs [s]
date	2012-08-28T06:15:01	Date and time of file creation	ontime5	19829.463374421	Sum of GTIs [s]
revision	4	Processing version of data	ontime6	19829.422334433	Sum of GTIs [s]
			ontime7	19829.504414424	Sum of GTIs [s]
			ontime8	19829.381294429	Sum of GTIs [s]
			ontime9	19829.340254426	Sum of GTIs [s]
			l1events	1165739	Number of level 1 events

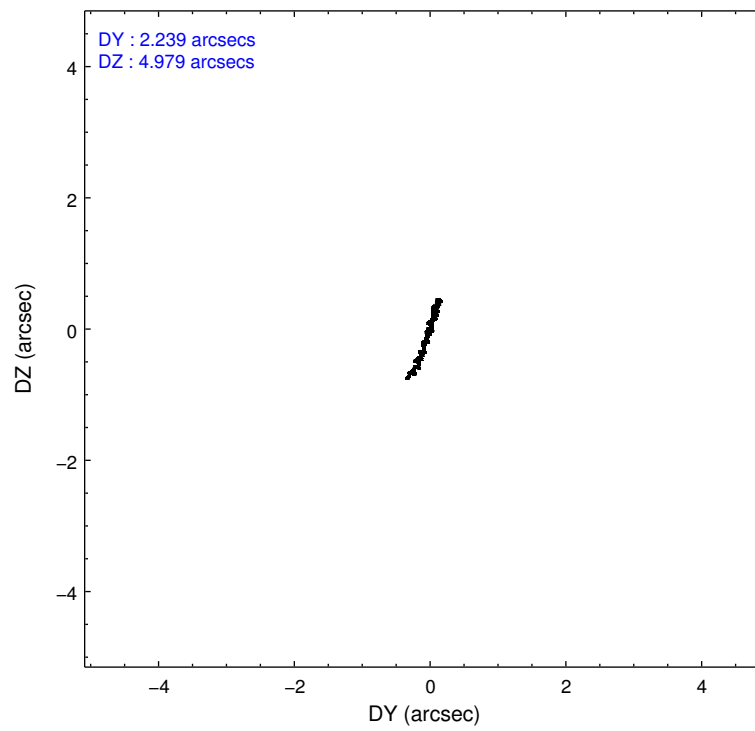
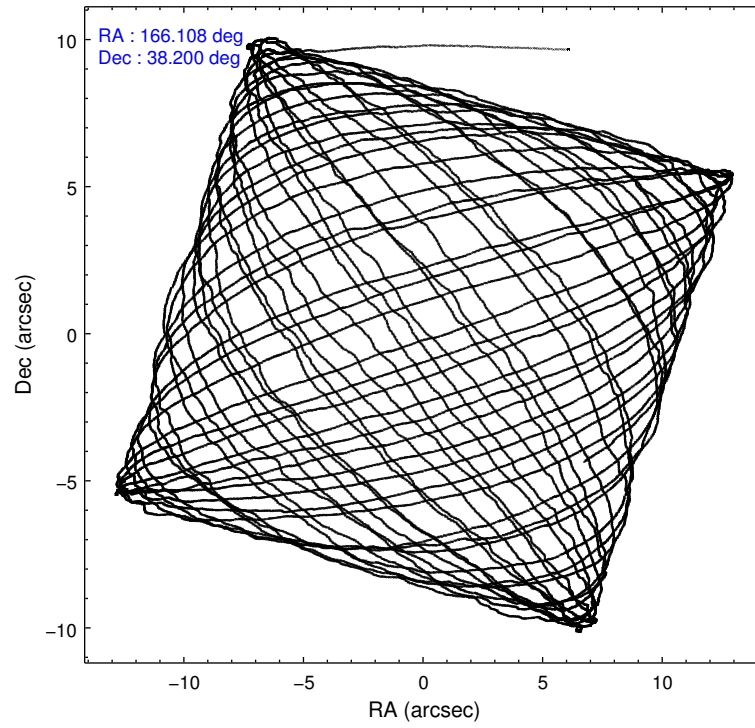
### 2.1.4 Events

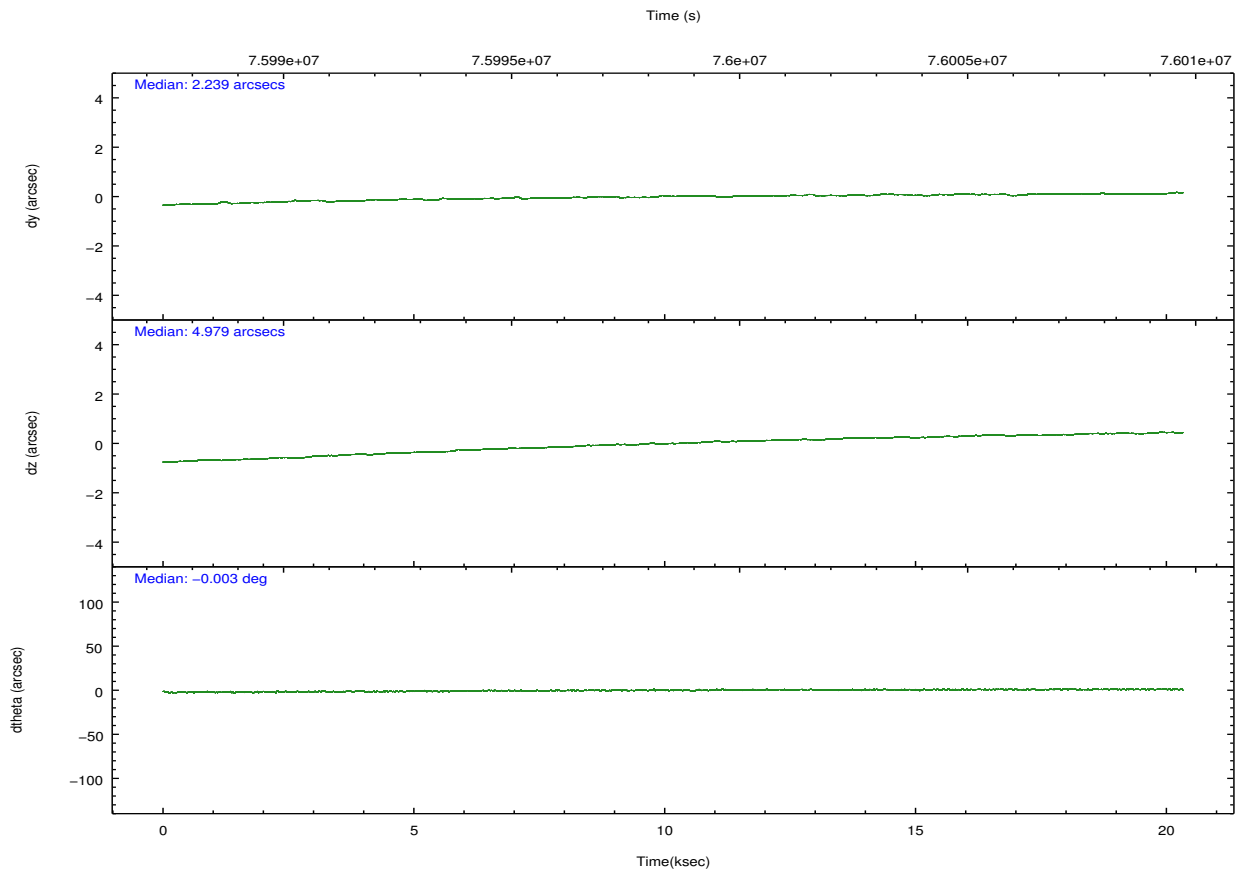
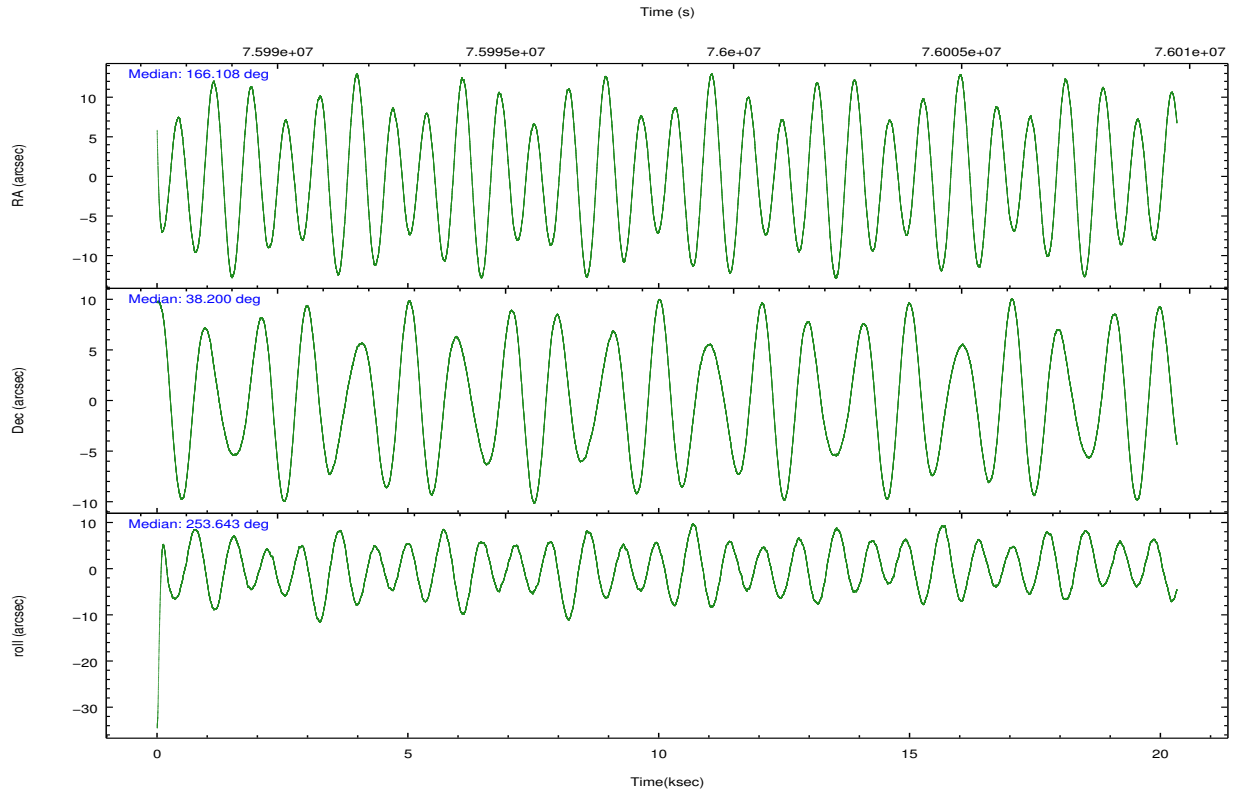
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	153318	212853	214299	218504	223850	142915	grade 0 events	12566	25763	69499	21433	58243	16745
rejected events	131155	95138	121115	92958	135276	115593		8%	12%	32%	9%	26%	11%
rejected %	85%	44%	56%	42%	60%	80%	grade 1 events	97	243	583	467	421	88
								0%	0%	0%	0%	0%	0%
							grade 2 events	3908	33141	11196	28002	11817	4062
								2%	15%	5%	12%	5%	2%
							grade 3 events	1533	7894	4117	12753	4965	1817
								0%	3%	1%	5%	2%	1%
							grade 4 events	1621	6806	4115	12718	4720	1764
								1%	3%	1%	5%	2%	1%
							grade 5 events	4170	14516	5271	16215	6388	5053
								2%	6%	2%	7%	2%	3%
							grade 6 events	2540	44150	4298	50687	8874	2941
								1%	20%	2%	23%	3%	2%
							grade 7 events	126883	80340	115220	76229	128422	110445
								82%	37%	53%	34%	57%	77%

## 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	166.099633	166.1079958038171	Subarray requested	NONE	NONE
[deg] Pointing Dec	38.226553	38.19993157340851	Alternating exposures requested	N	N
[deg] Pointing Roll	253.496703	253.648135087059	[s] Primary exposure time	0.000000	3.2
[mm] SIM focus pos	-0.684267	-0.6828225247311905			
[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)	75988705.184000	75987652.386262			
Observation start date	2000-05-29T11:57:21	2000-05-29T11:40:52			
[s] Observation end time (MET)	76008705.184000	76009275.27455799			
Observation end date	2000-05-29T17:30:41	2000-05-29T17:41:15			
Read mode	TIMED	TIMED			

## 2.3 Aspect



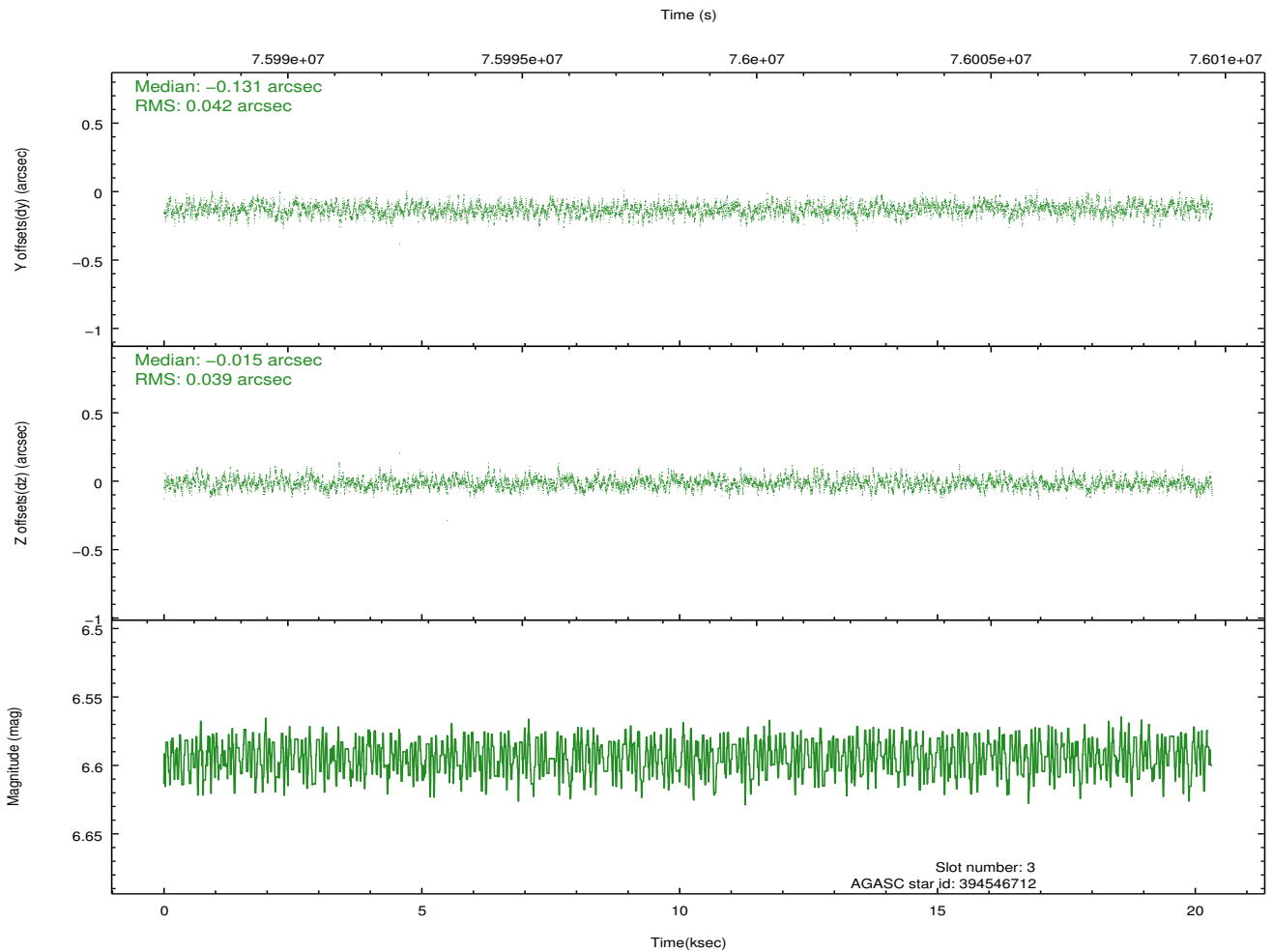
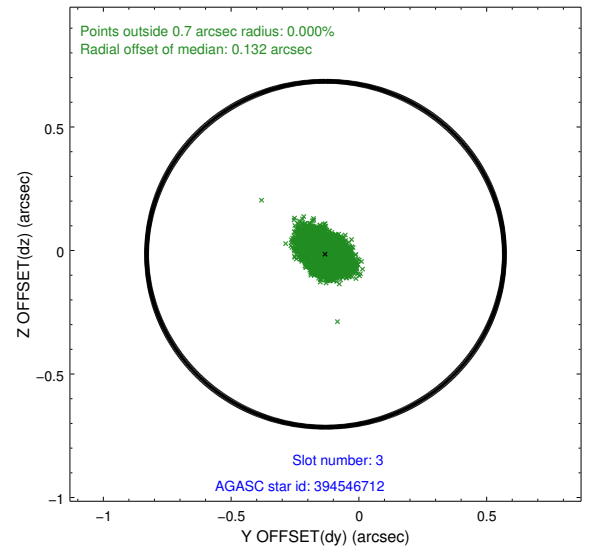
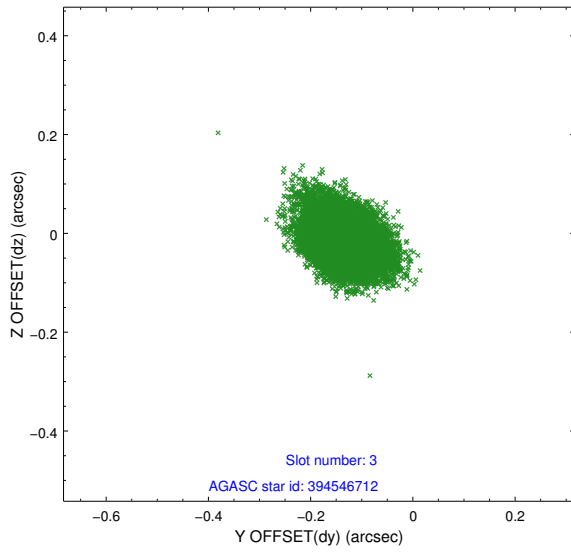


### Slot Statistics

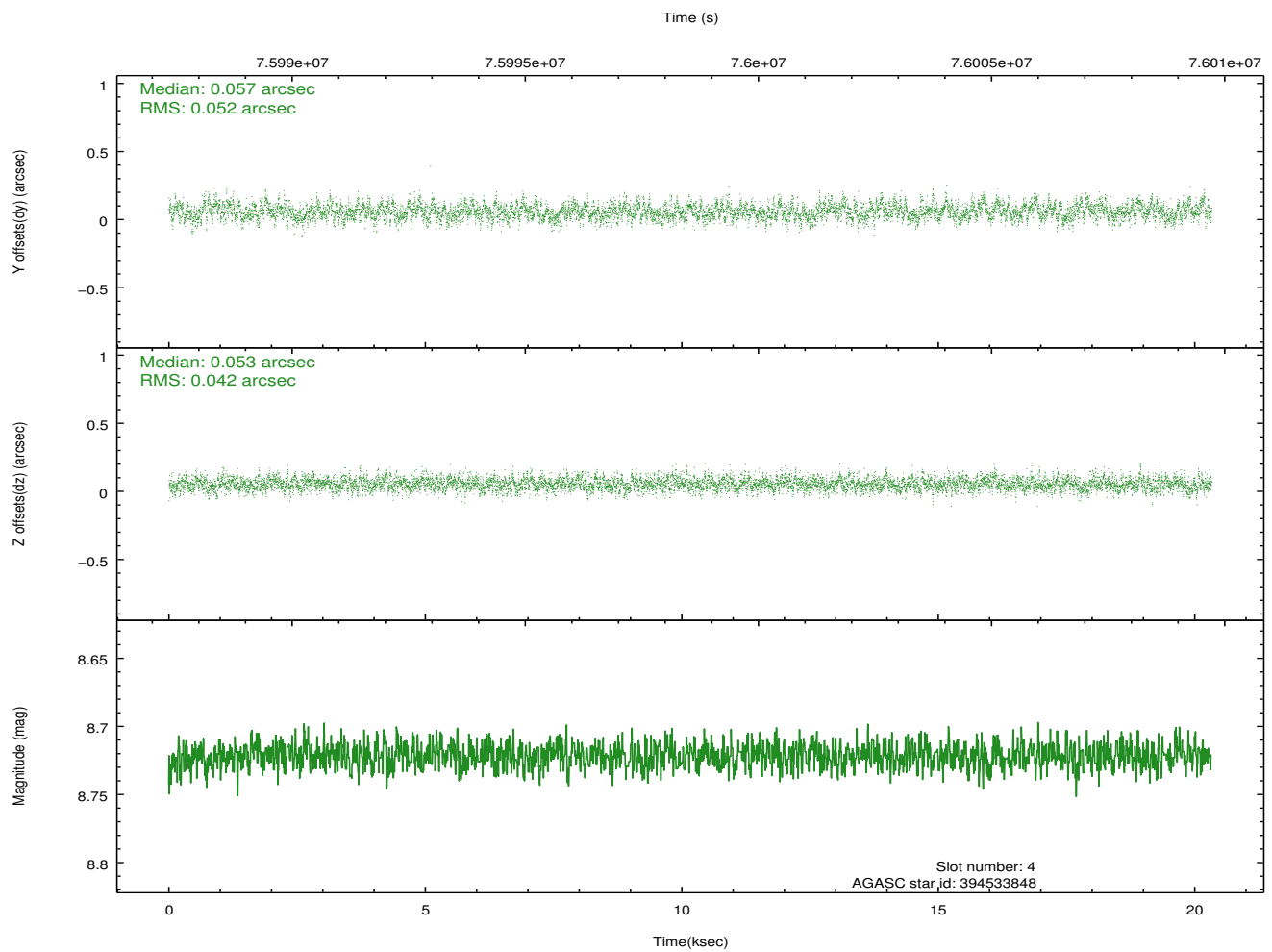
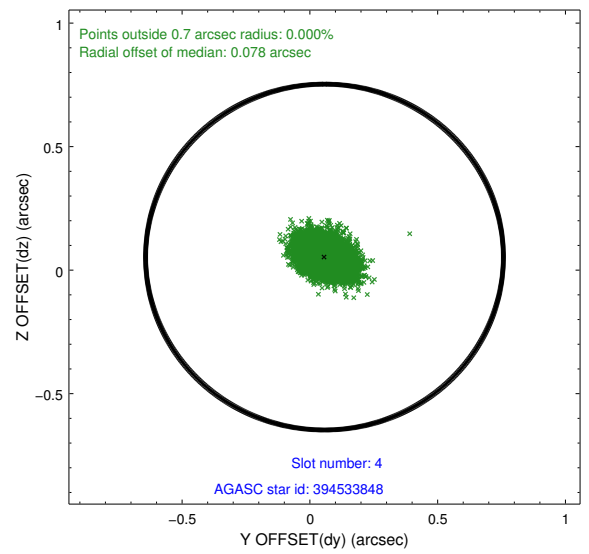
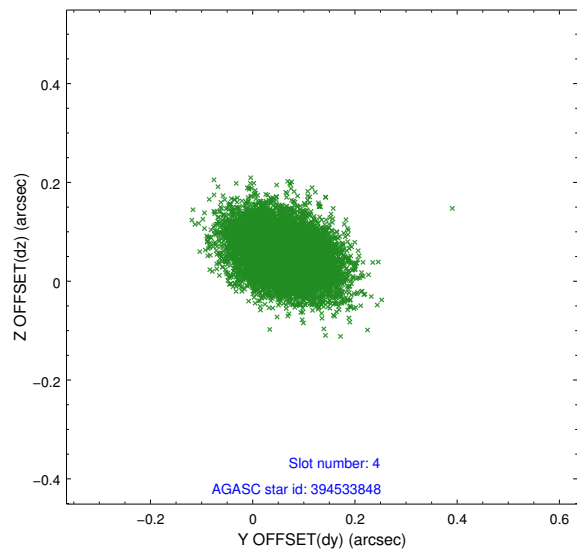
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.10	4958	-0.033	-0.045	0.014	0.024	0.000000	0.000000	-754.68	-1788.15
1	FID	ACIS-S-4	7.19	4958	-0.009	0.028	0.008	0.016	0.000000	0.000000	2158.57	120.16
2	FID	ACIS-S-5	7.24	4958	0.012	0.026	0.013	0.021	0.000000	0.000000	-1807.21	114.09
3	GUIDE	394546712	6.59	9916	-0.131	-0.015	0.061	0.100	166.451462	38.394357	-862.77	779.37
4	GUIDE	394533848	8.72	9914	0.057	0.053	0.071	0.118	166.382906	38.276007	-398.94	716.45
5	GUIDE	394543960	9.79	9911	0.161	-0.012	0.113	0.187	165.802757	37.787371	1755.15	-361.05
6	GUIDE	394531368	9.99	9905	-0.121	-0.073	0.106	0.174	165.794613	38.837127	-1865.31	-1445.39
7	GUIDE	394527600	9.99	9906	0.032	0.046	0.102	0.167	166.166468	38.538638	-1130.46	-139.10

## 2.4 Star Slots

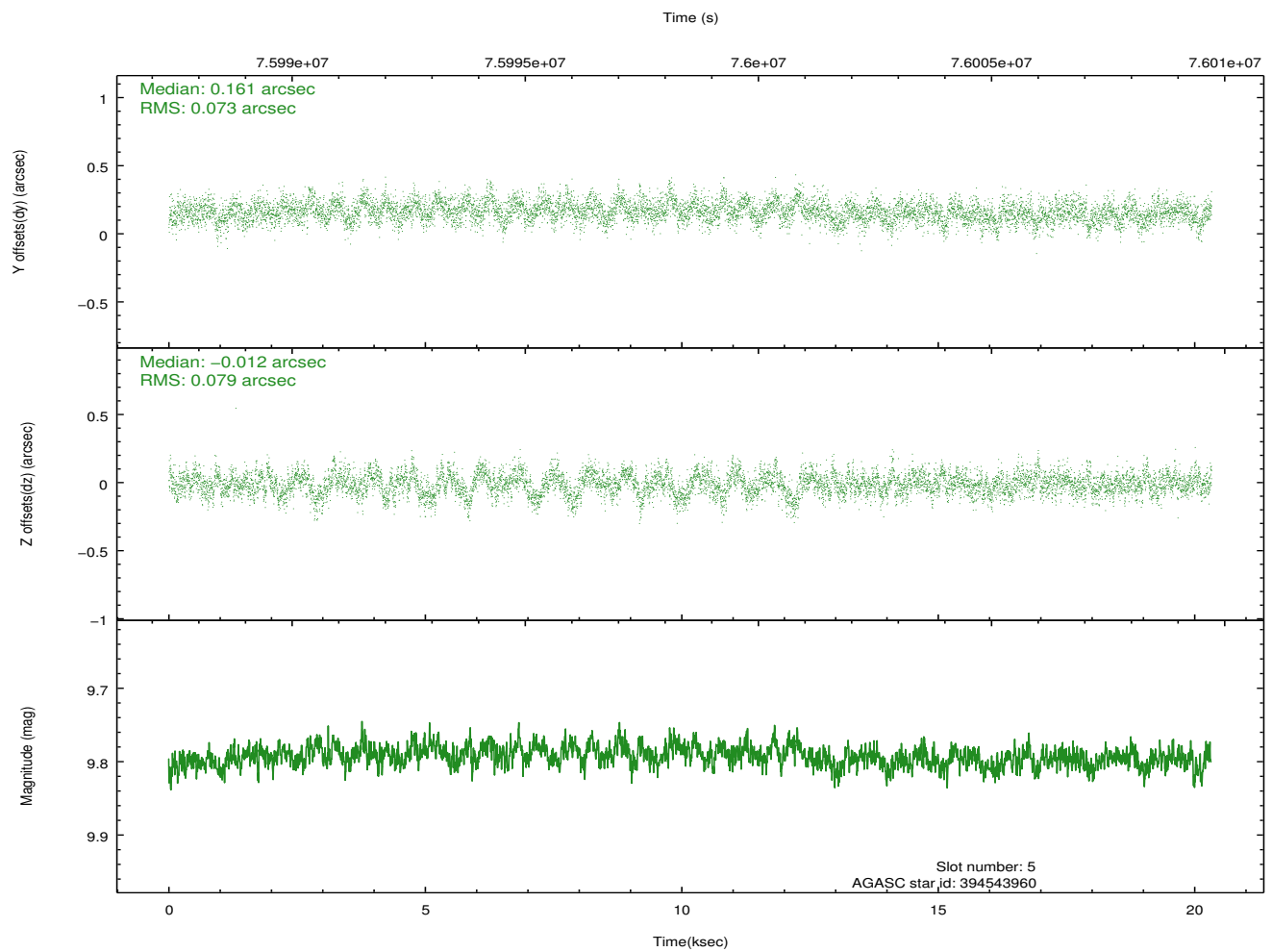
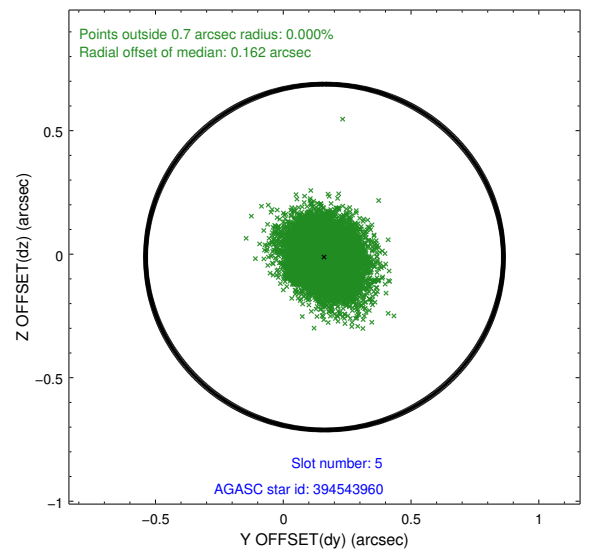
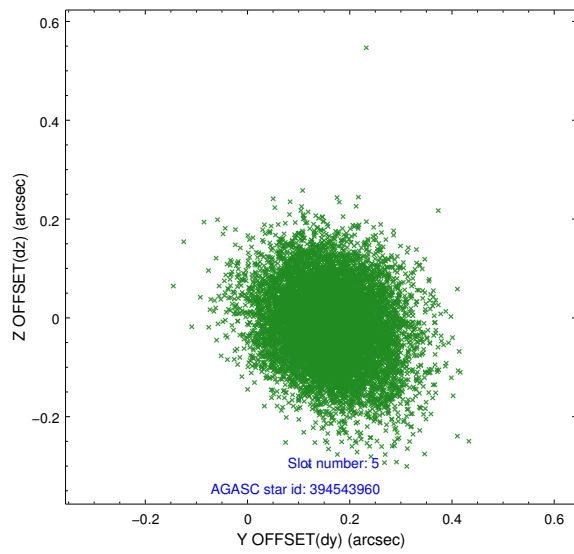
### 2.4.1 Slot 3



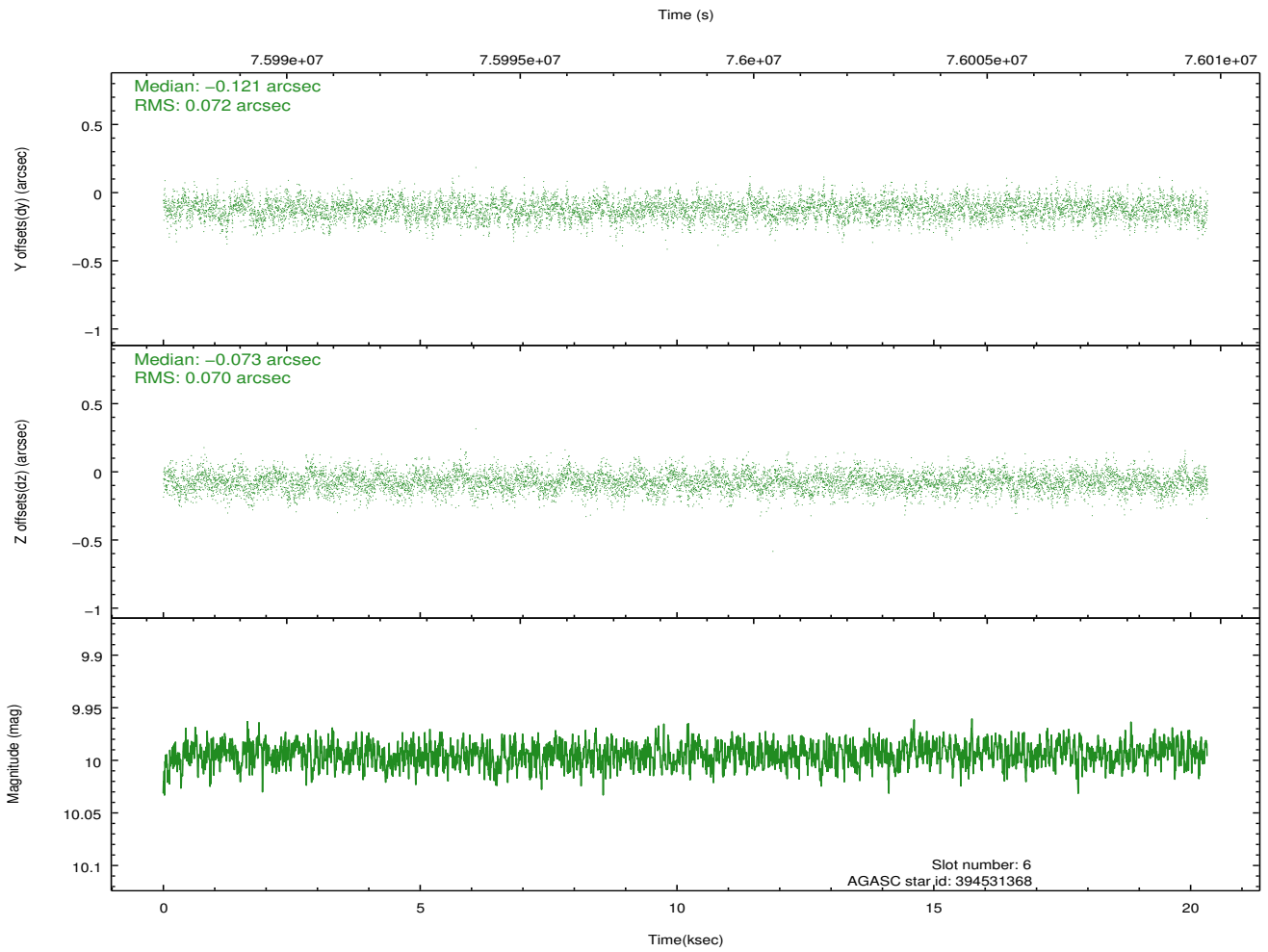
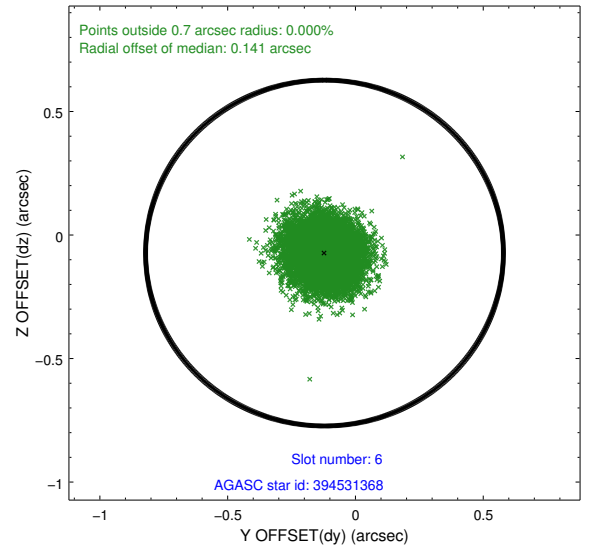
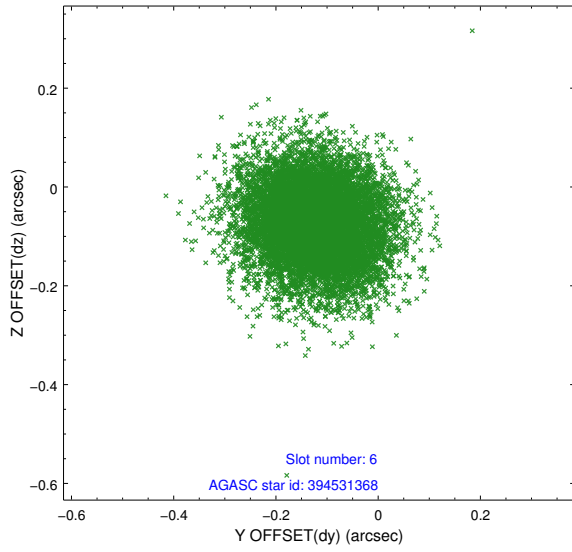
## 2.4.2 Slot 4



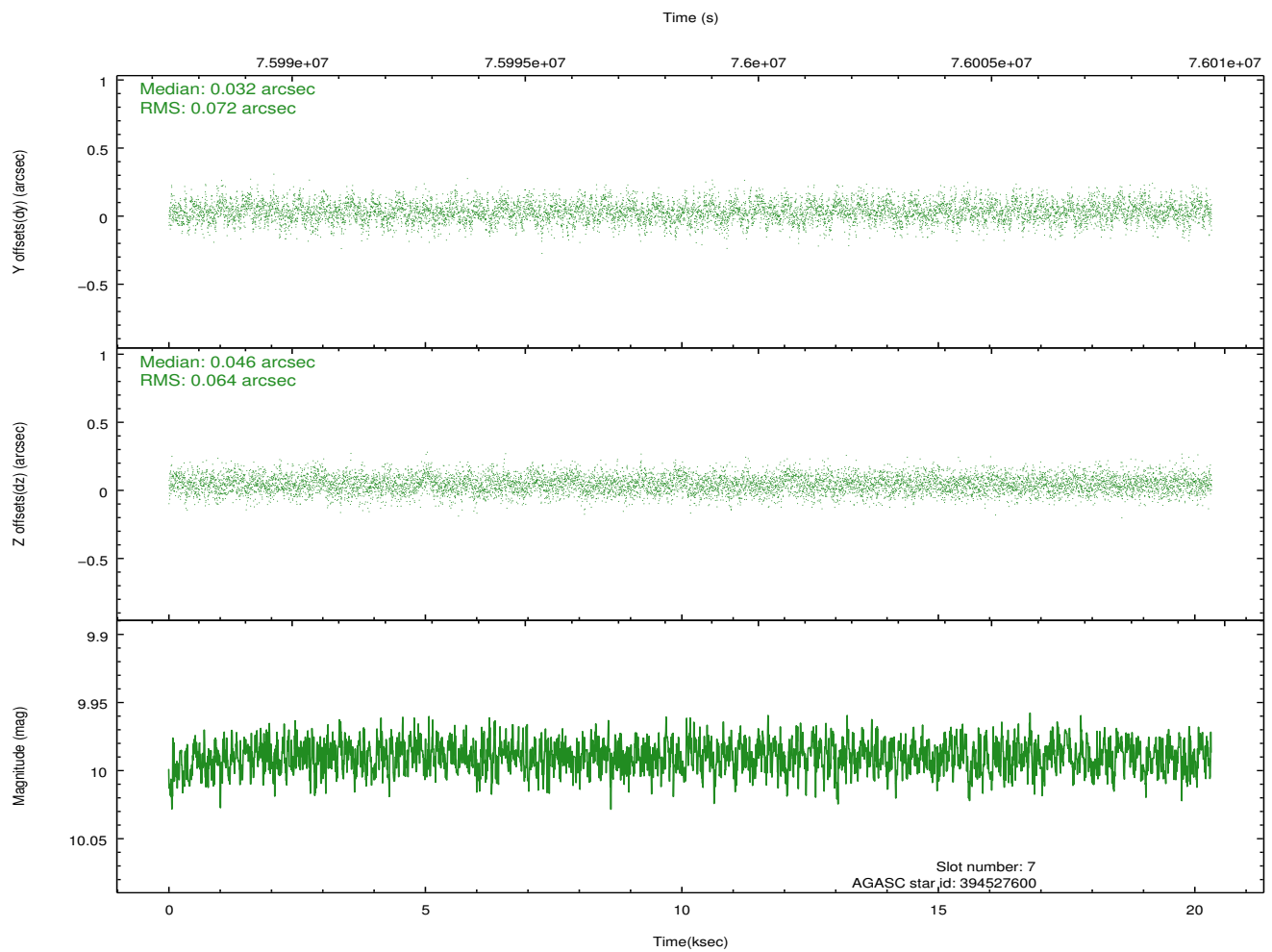
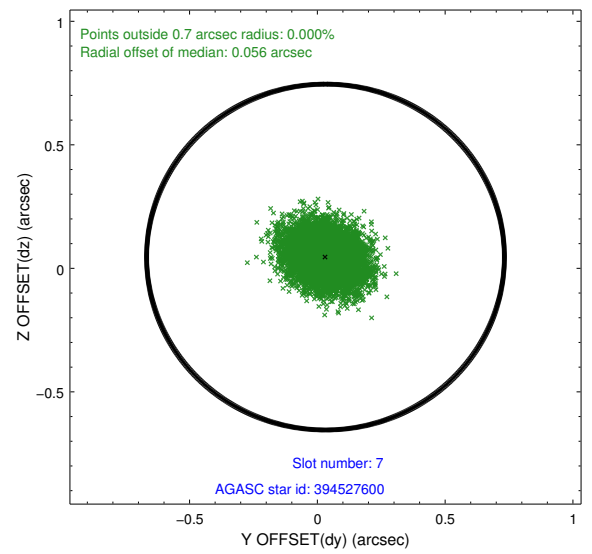
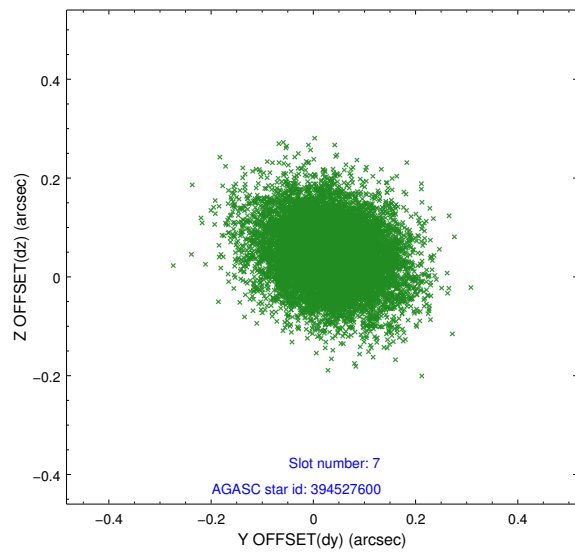
### 2.4.3 Slot 5



## 2.4.4 Slot 6

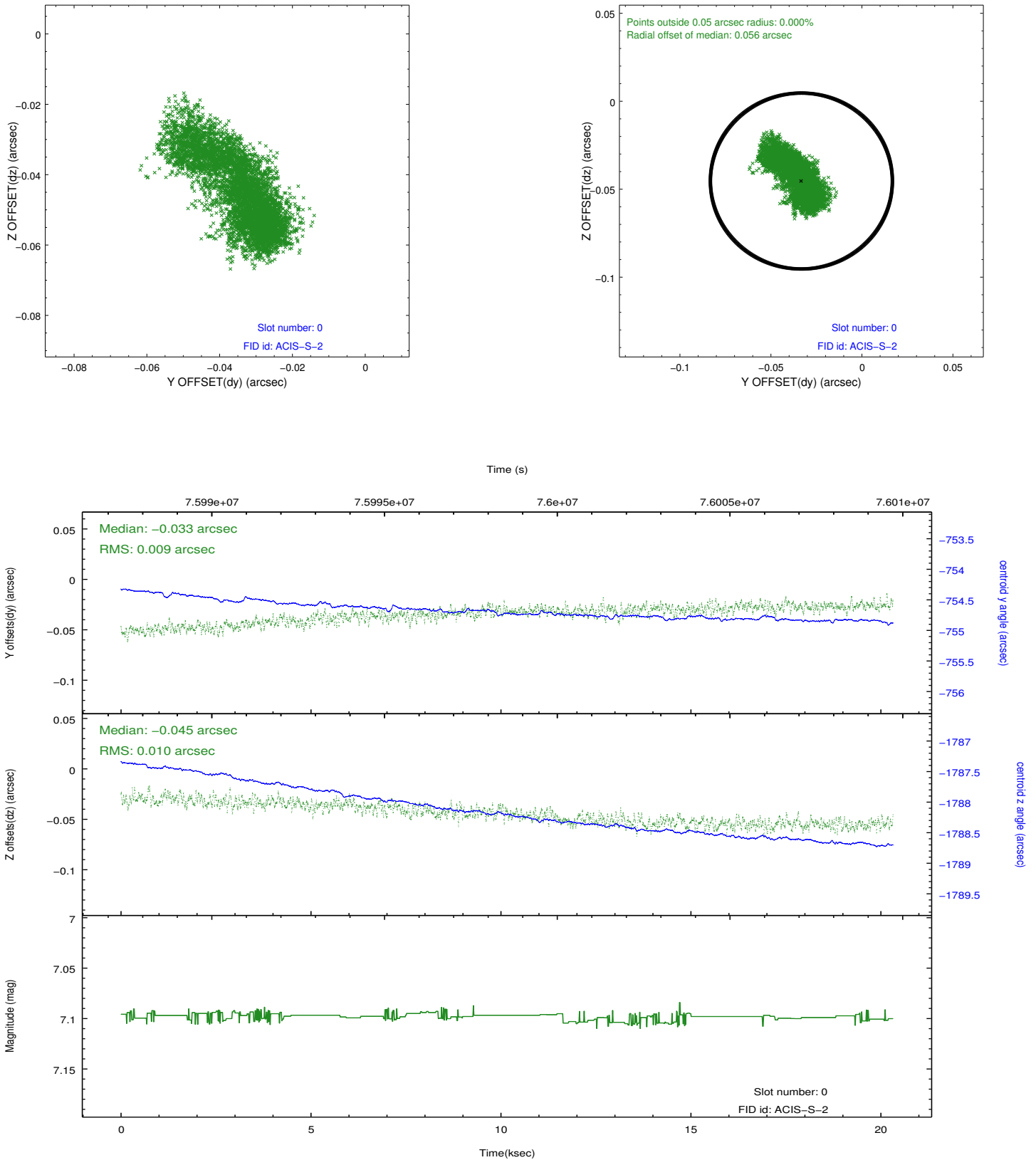


## 2.4.5 Slot 7

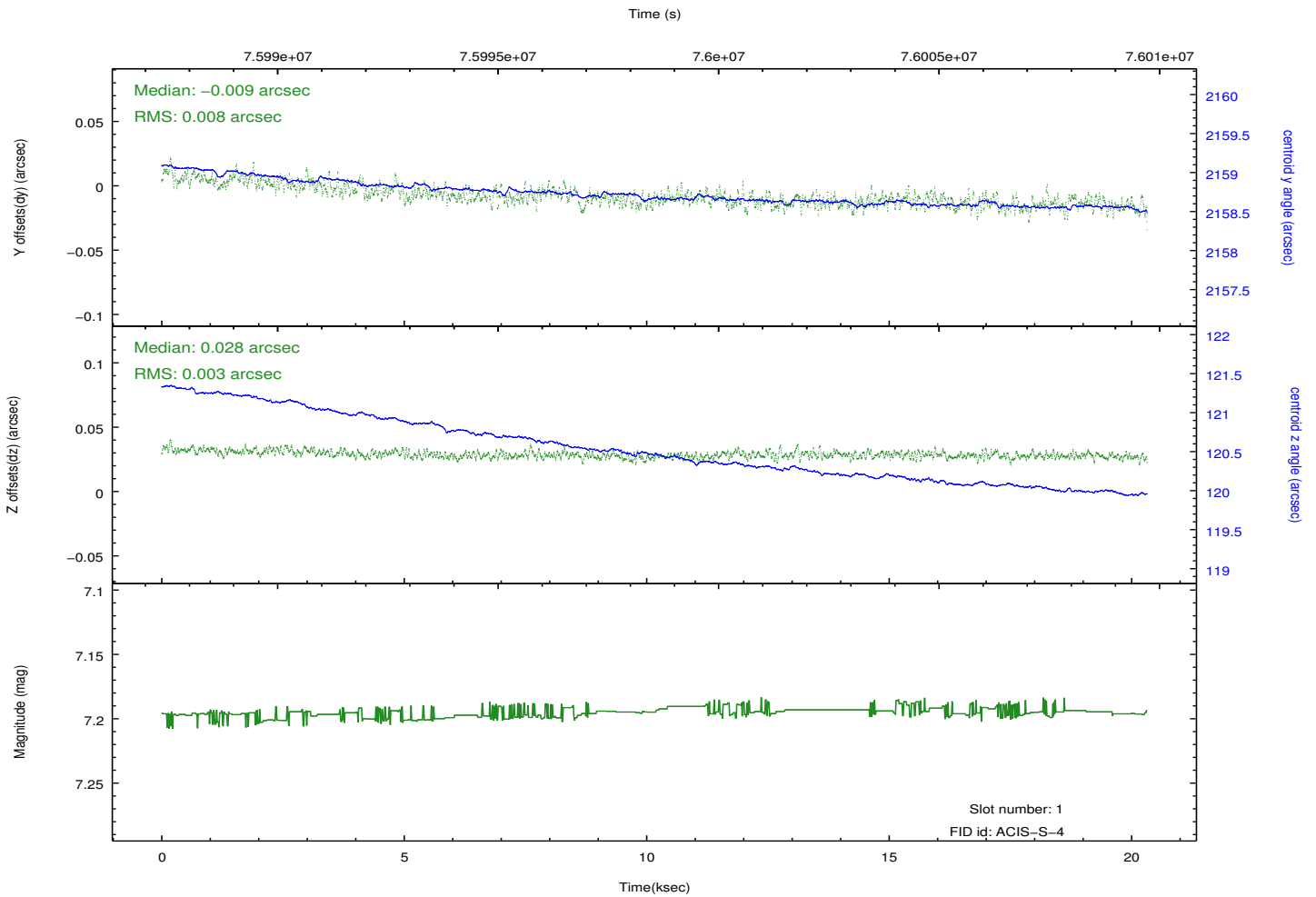
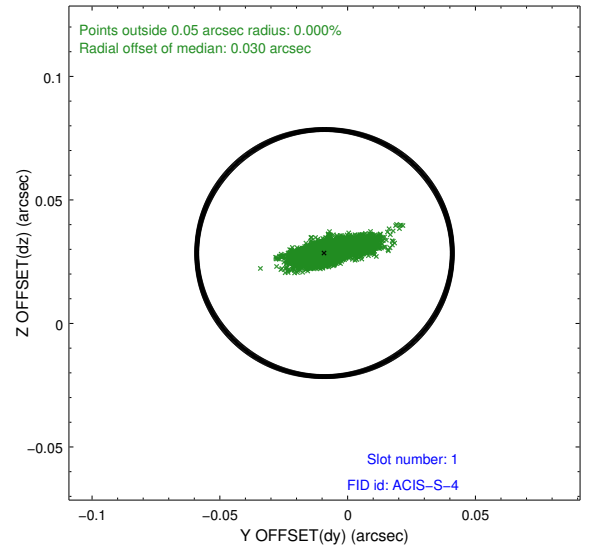
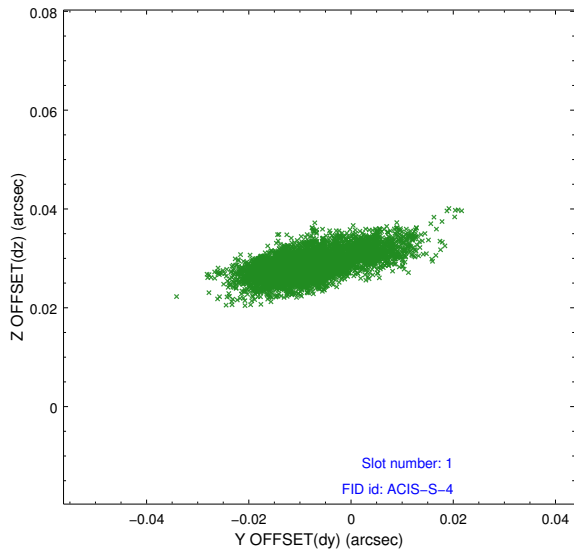


## 2.5 FID Slots

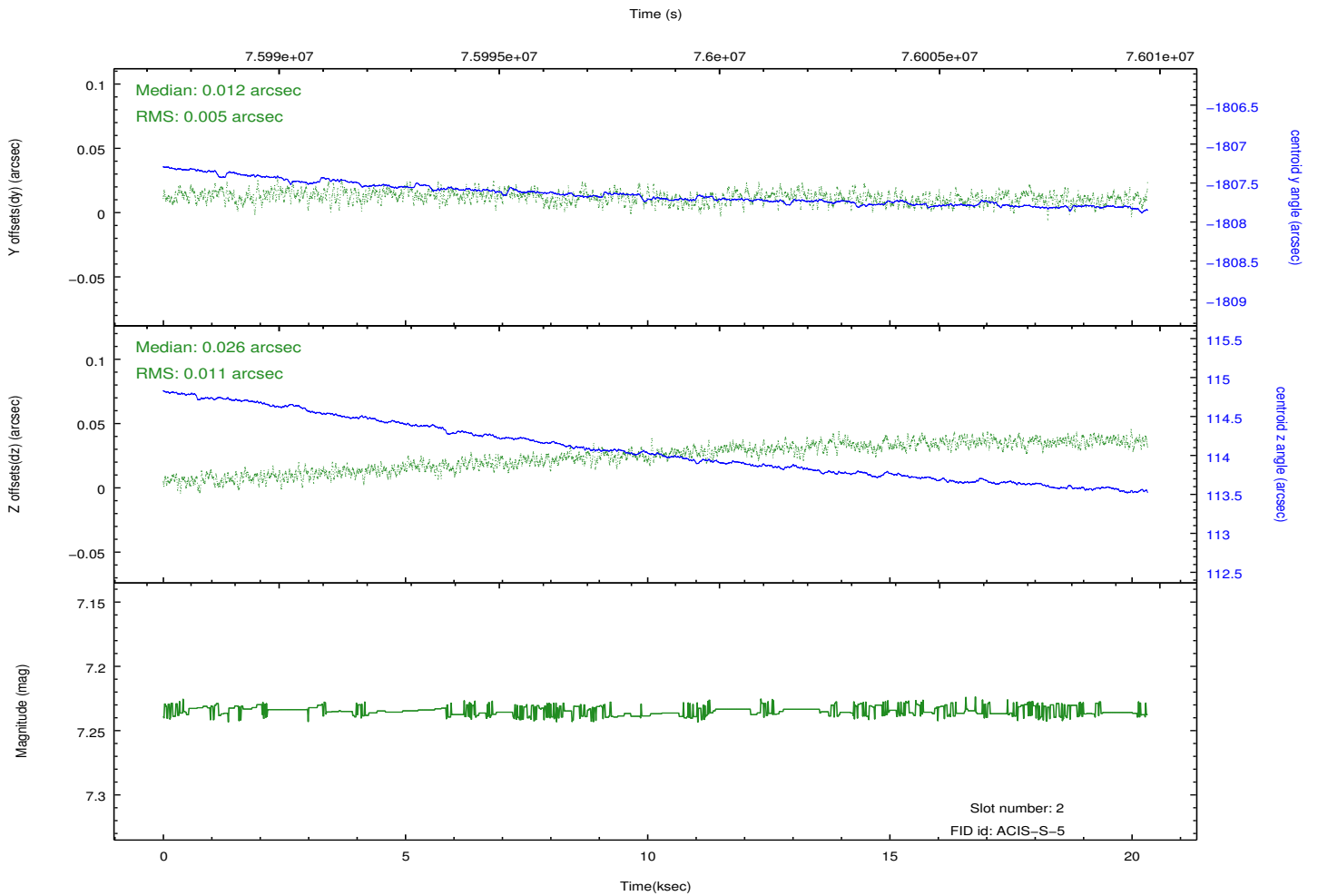
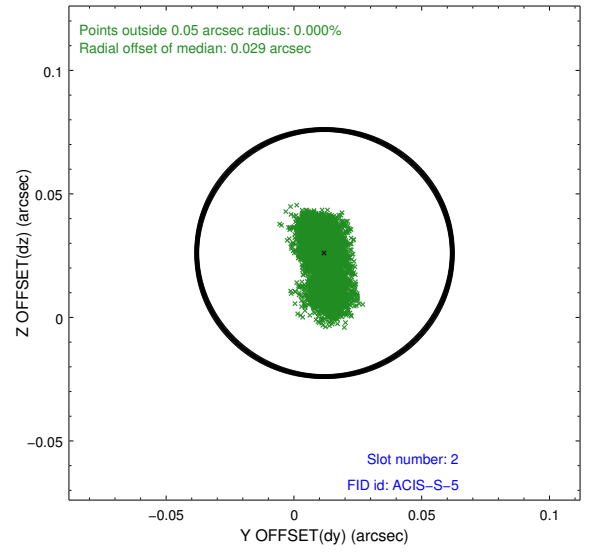
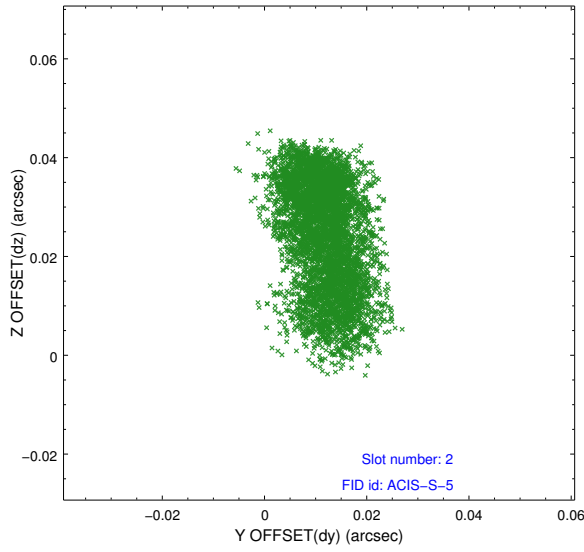
### 2.5.1 Slot 0



## 2.5.2 Slot 1

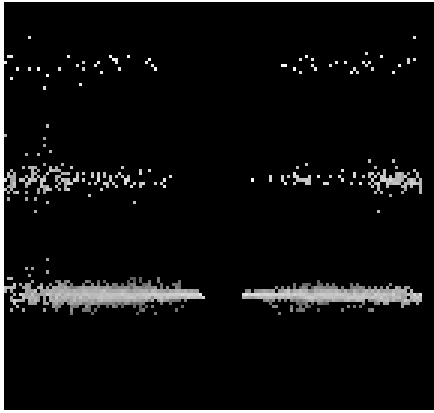


### 2.5.3 Slot 2

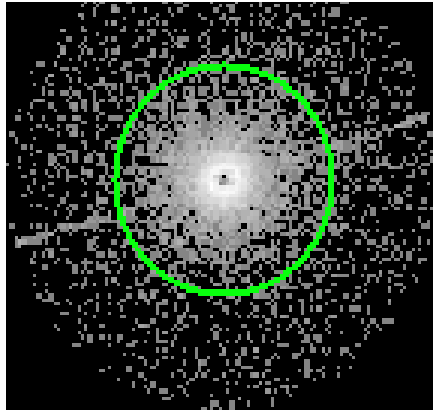


# 3 Gratings

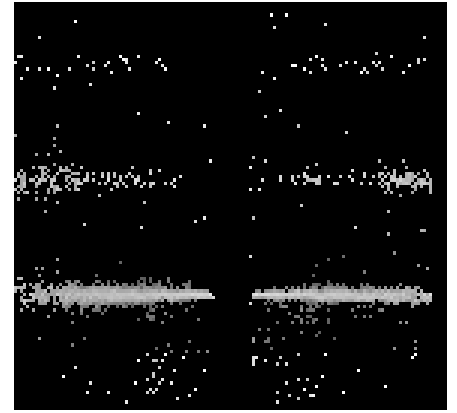
## 3.1 HEG Arm



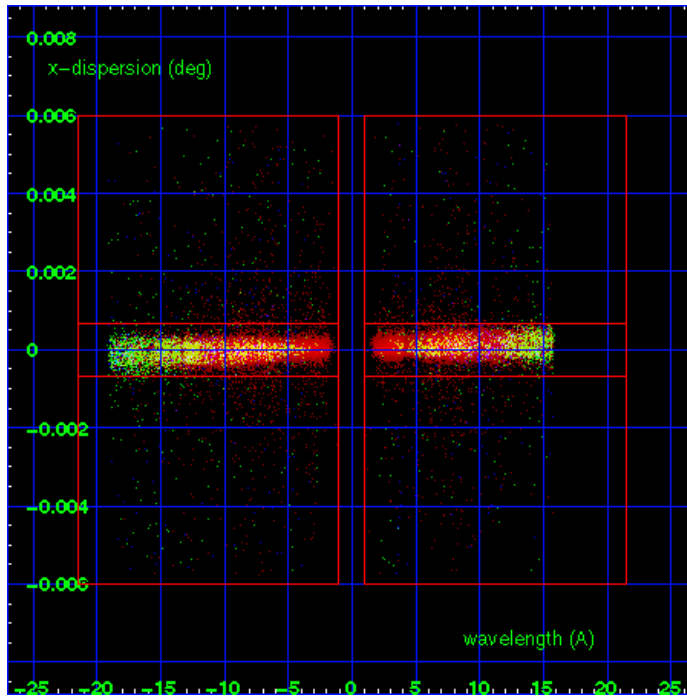
HEG Order Sort 123



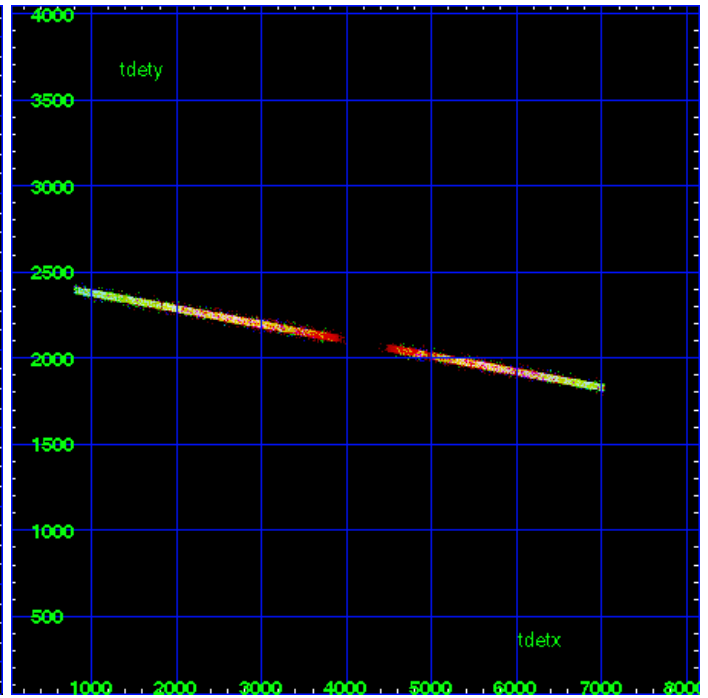
HEG Zero Order



HEG Order Sort ALL

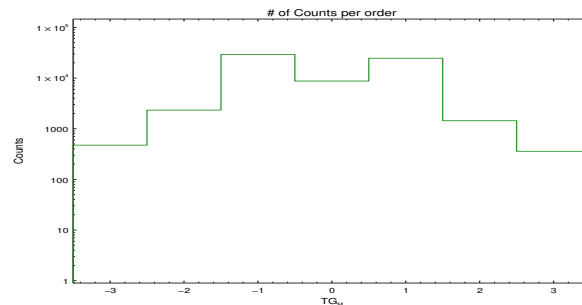


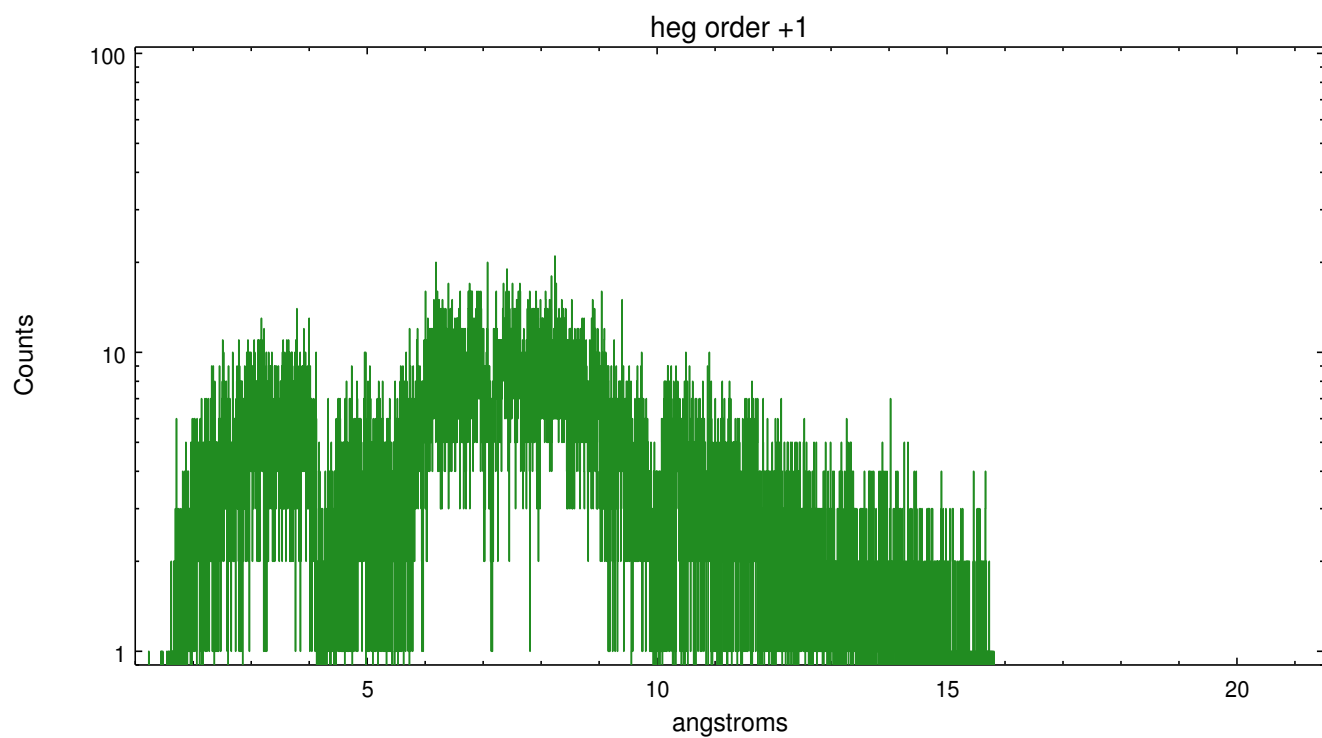
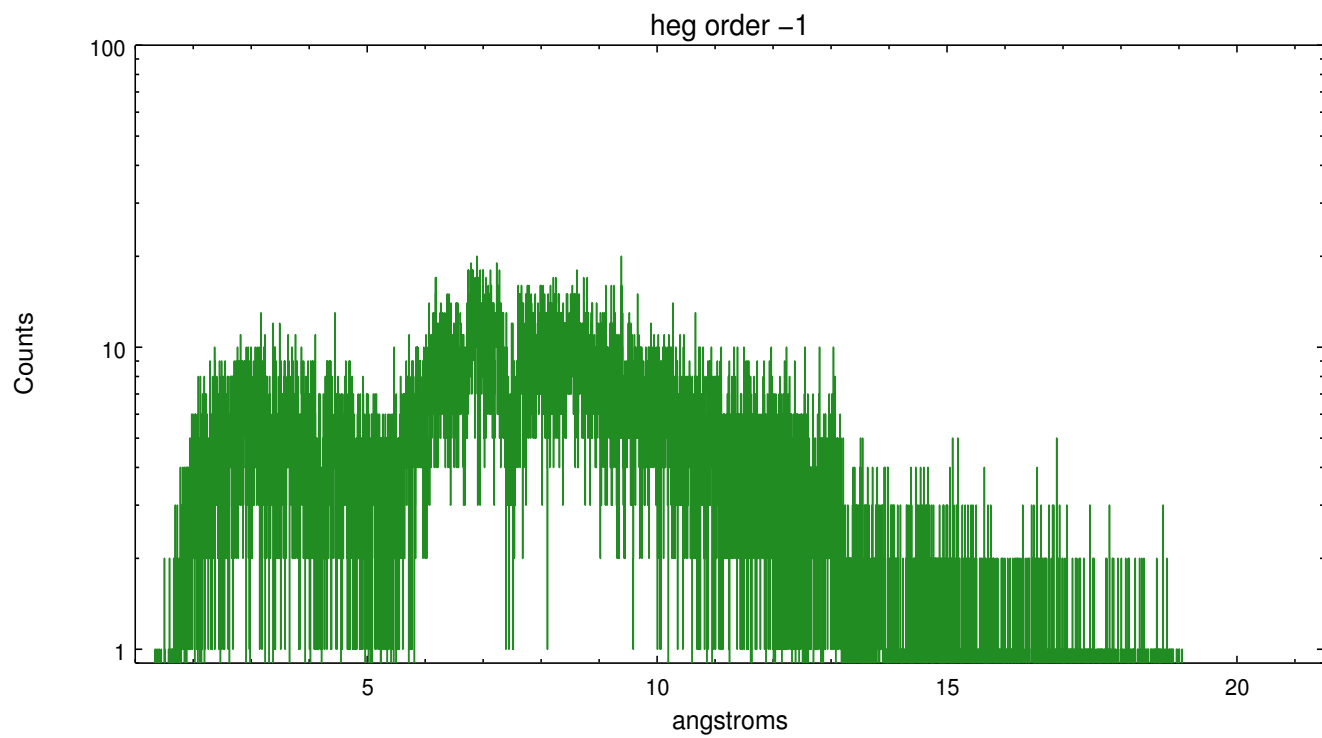
Spot Image HEG



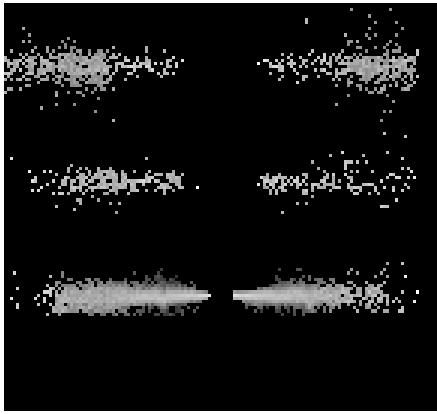
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	474	2331	29266	8751	24668	1440	359

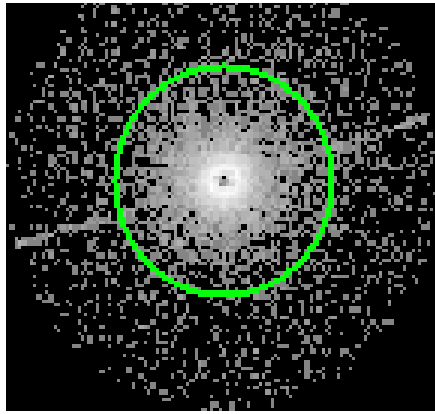




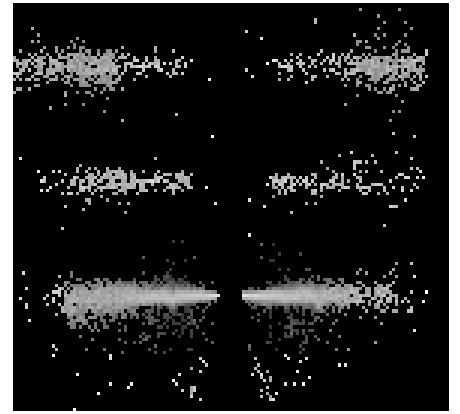
### 3.2 MEG Arm



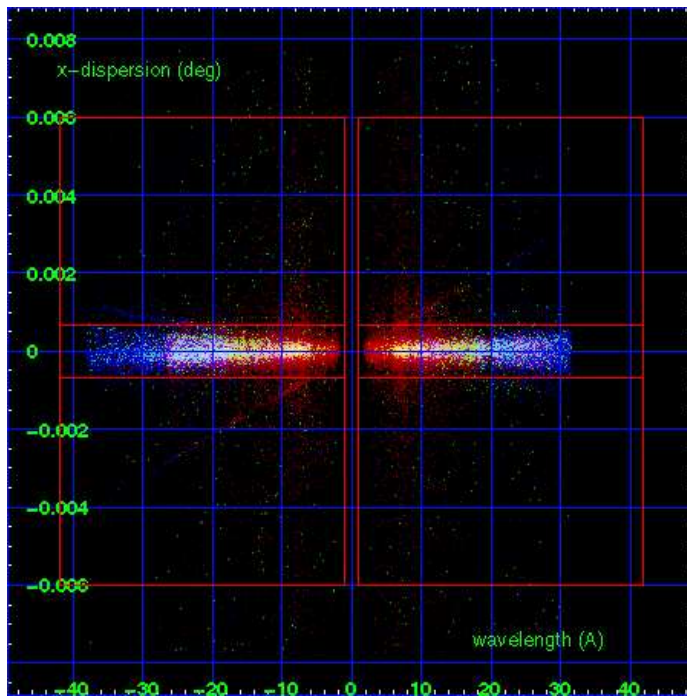
MEG Order Sort 123



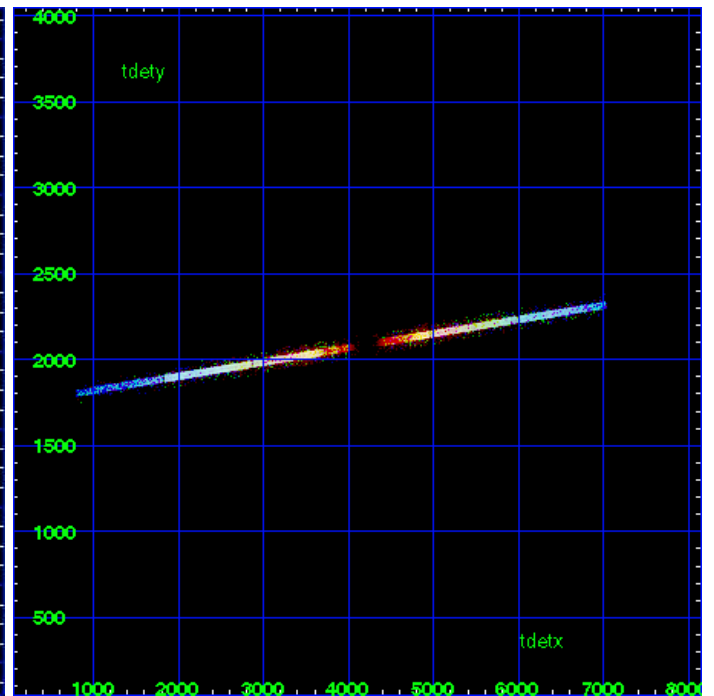
MEG Zero Order



MEG Order Sort ALL

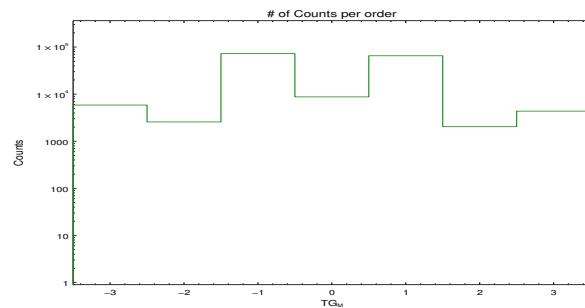


Spot Image MEG

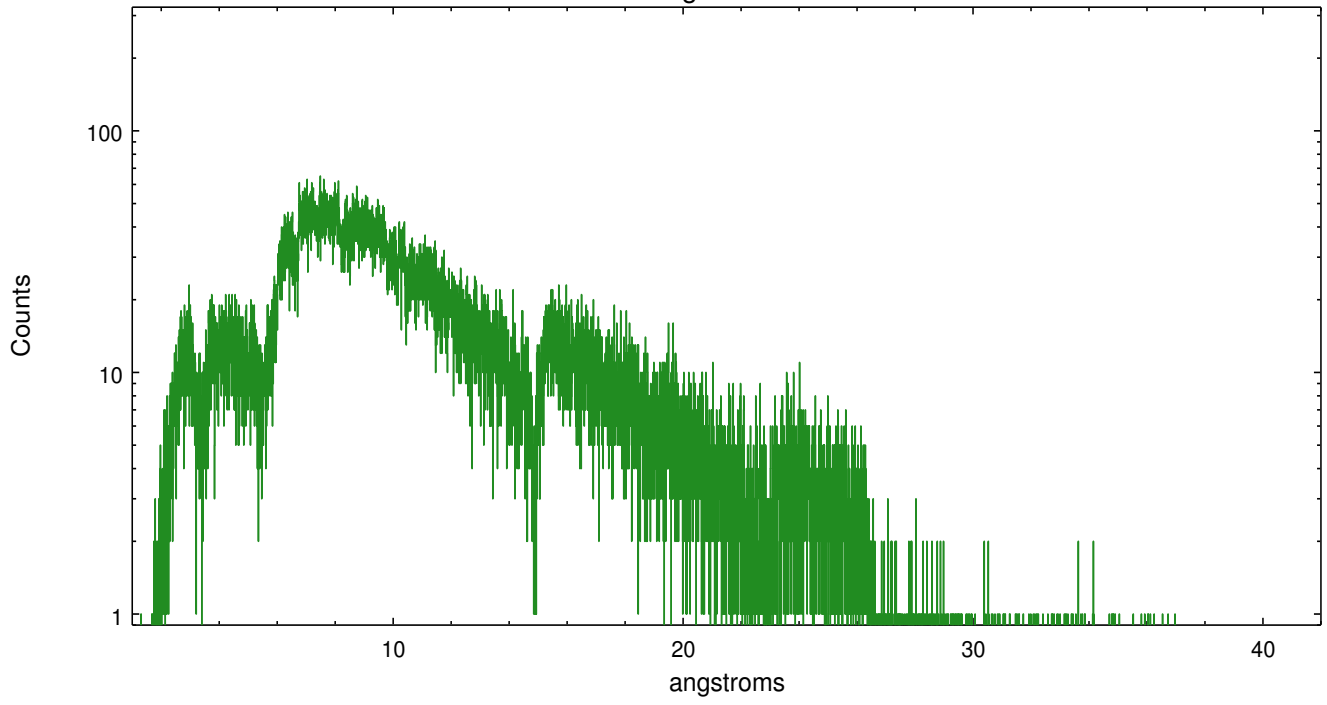


Full Detector MEG

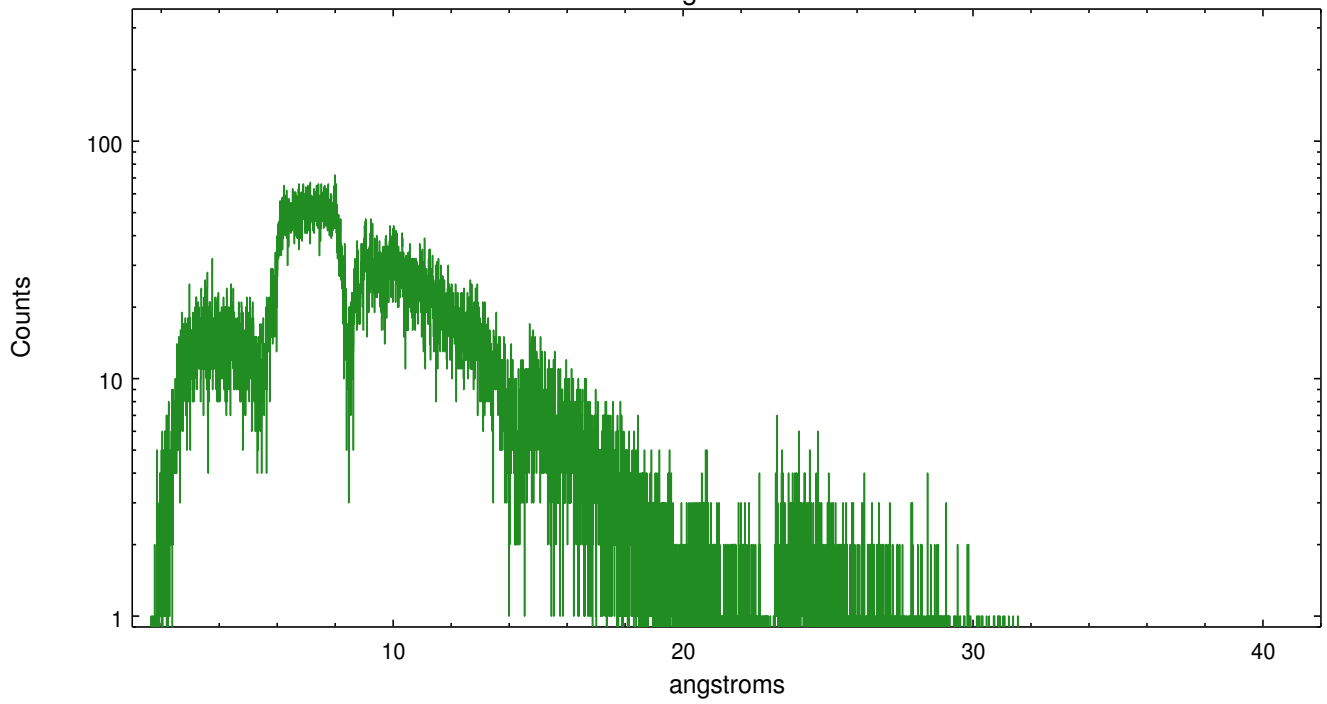
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	5866	2567	72585	8751	65343	2037	4355



meg order -1



meg order +1



# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.08.31
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	19.83

## 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 ( $x=4063.23$ ,  $y=4161.57$ ) 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 as `tg_findzo` (currently in ISIS as `findzo`). The tool calculates the point of intersection of the readout streak and the meg 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.