

# V&V Reference Report

## L2 ASCDS Version : 10.2.1

Observation 16540 - L2 Version 2  
Chandra X-Ray Center

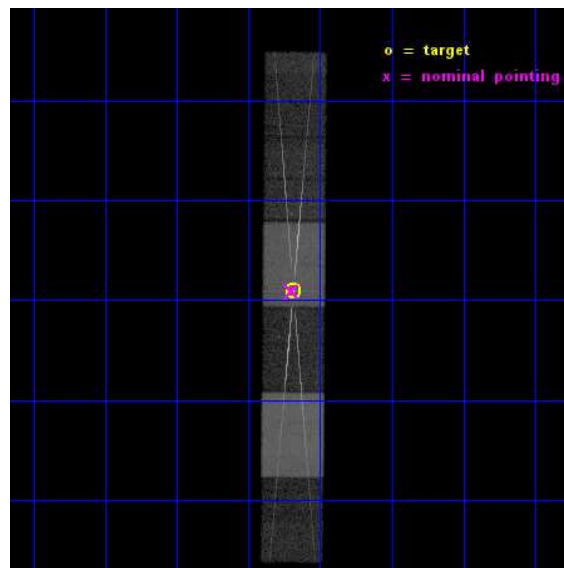
L2 Processing Date : Dec 10 2014

## Contents

<b>1</b>	<b>Front</b>	<b>2</b>
<b>2</b>	<b>OBI</b>	<b>3</b>
2.1	OBI . . . . .	3
2.1.1	Images . . . . .	3
2.1.2	Bias . . . . .	3
2.1.3	Parameters . . . . .	4
2.1.4	Events . . . . .	4
2.2	Compared Parameters . . . . .	5
2.3	Aspect . . . . .	6
2.4	Star Slots . . . . .	9
2.4.1	Slot 3 . . . . .	9
2.4.2	Slot 4 . . . . .	10
2.4.3	Slot 5 . . . . .	11
2.4.4	Slot 6 . . . . .	12
2.4.5	Slot 7 . . . . .	13
2.5	FID Slots . . . . .	14
2.5.1	Slot 0 . . . . .	14
2.5.2	Slot 1 . . . . .	15
2.5.3	Slot 2 . . . . .	16
<b>3</b>	<b>Gratings</b>	<b>17</b>
3.1	HEG Arm . . . . .	17
3.2	MEG Arm . . . . .	19
<b>A</b>	<b>Summary</b>	<b>21</b>
A.1	Status . . . . .	21
A.2	Comments . . . . .	21

# 1 Front

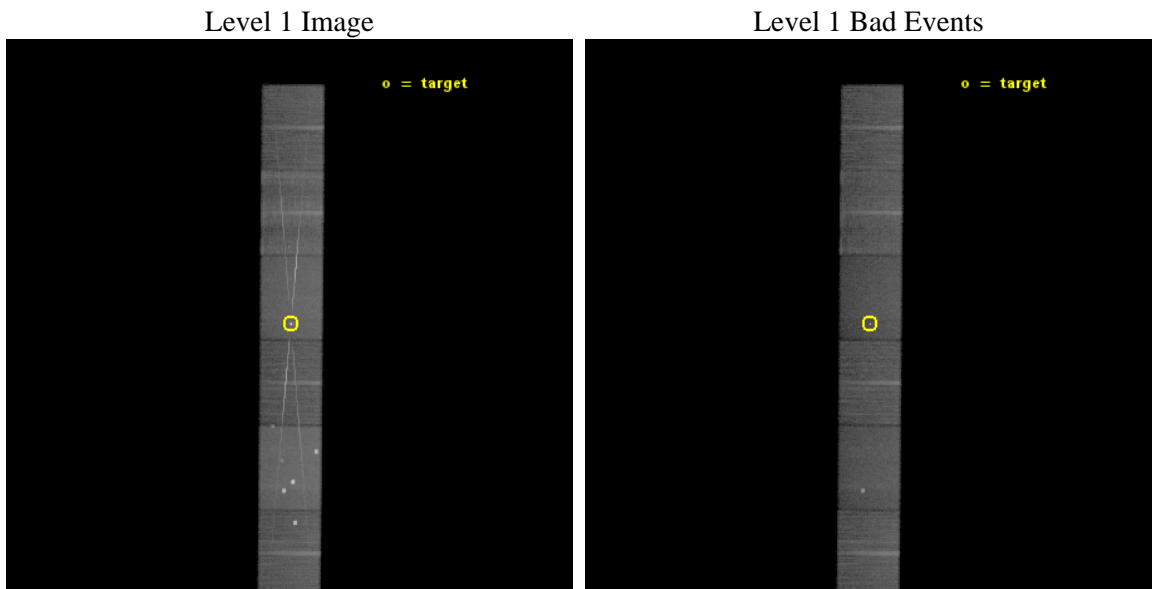
seq_num	702921	Sequence number
obs_id	16540	Observation id
title	Deep X-ray view of the bare nucleus Seyfert Ark120: unveiling the core of AGN	Proposal title
observer	Dr. Delphine Porquet	Principal investigator
object	Ark 120	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	79.0475	Observer's specified target RA [deg]
dec_targ	-0.149889	Observer's specified target Dec [deg]
ra_nom	79.050065117043	Nominal RA [deg]
dec_nom	-0.15149818551595	Nominal Dec [deg]
roll_nom	270.45663846697	Nominal Roll [deg]
revision	2	Processing version of data
ontime	48032.5	Sum of GTIs [s]
livetime	47256.733463464	Livetime [s]
ontime4	48032.5	Sum of GTIs [s]
ontime5	48032.5	Sum of GTIs [s]
ontime6	48032.5	Sum of GTIs [s]
ontime7	48032.5	Sum of GTIs [s]
ontime8	48032.5	Sum of GTIs [s]
ontime9	48032.5	Sum of GTIs [s]
l2events	394579	Number of level 2 events



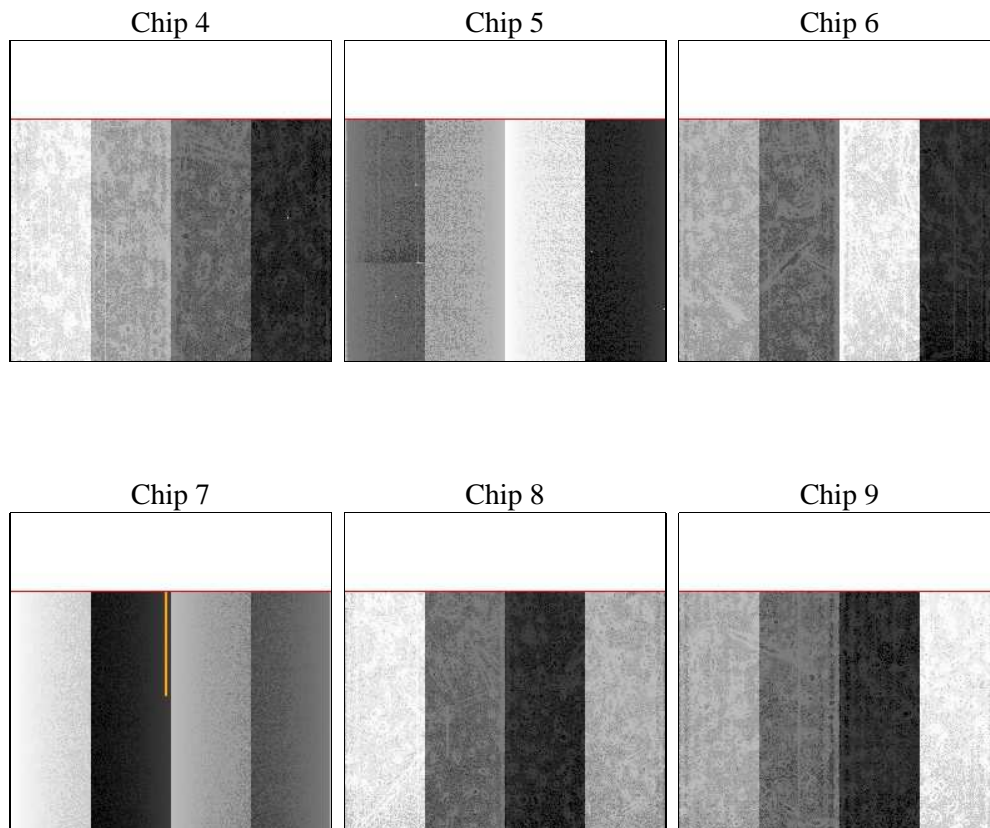
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	48000.000000	[s] Scheduled observation exposure time
ascdsver	10.3.1	Processing system revision	ontime	48032.5	Sum of GTIs [s]
caldbver	4.6.4	&#160	ontime4	48032.5	Sum of GTIs [s]
date	2014-12-10T22:09:44	Date and time of file creation	ontime5	48032.5	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	48032.5	Sum of GTIs [s]
			ontime7	48032.5	Sum of GTIs [s]
			ontime8	48032.5	Sum of GTIs [s]
			ontime9	48032.5	Sum of GTIs [s]
			l1events	1421543	Number of level 1 events
			tgmetho	FINDZO	Method used to create src1a file
				411475	

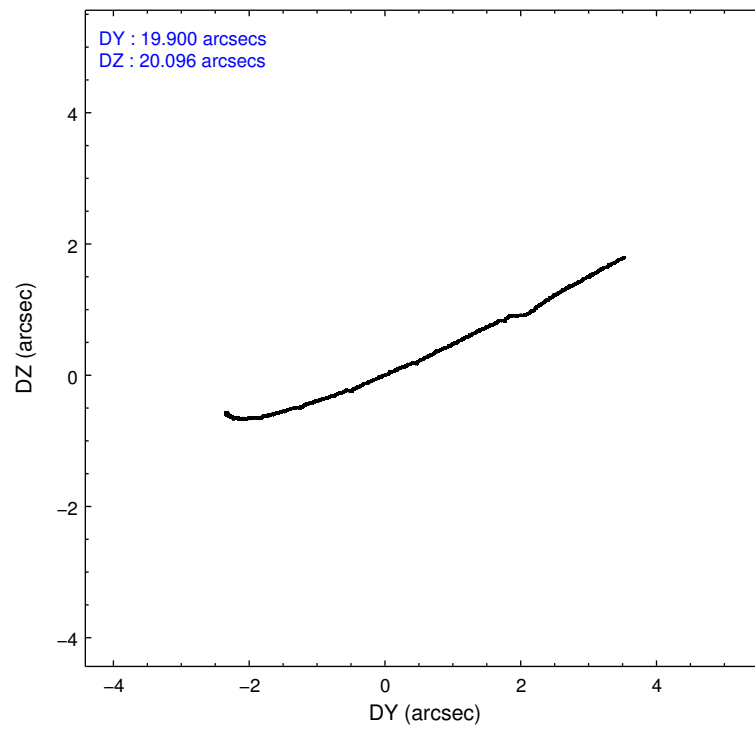
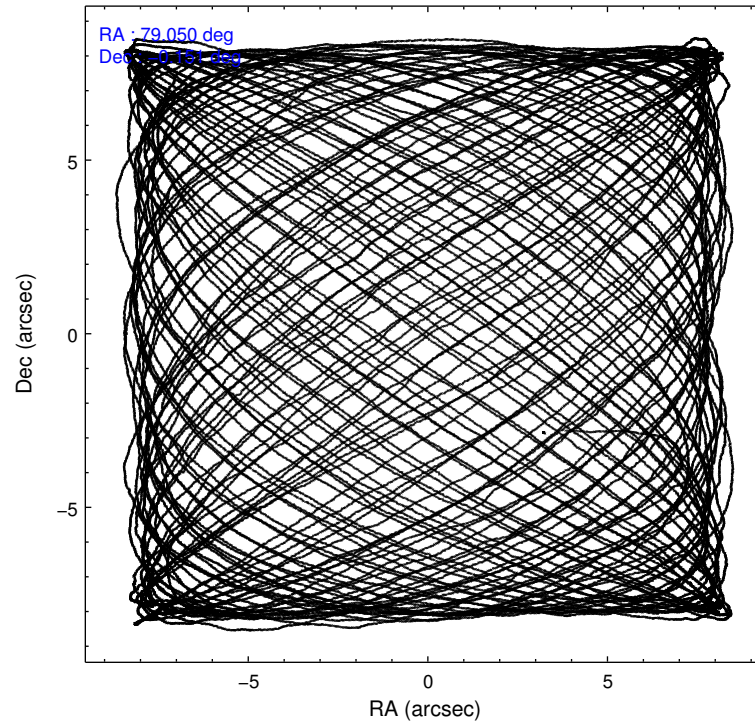
### 2.1.4 Events

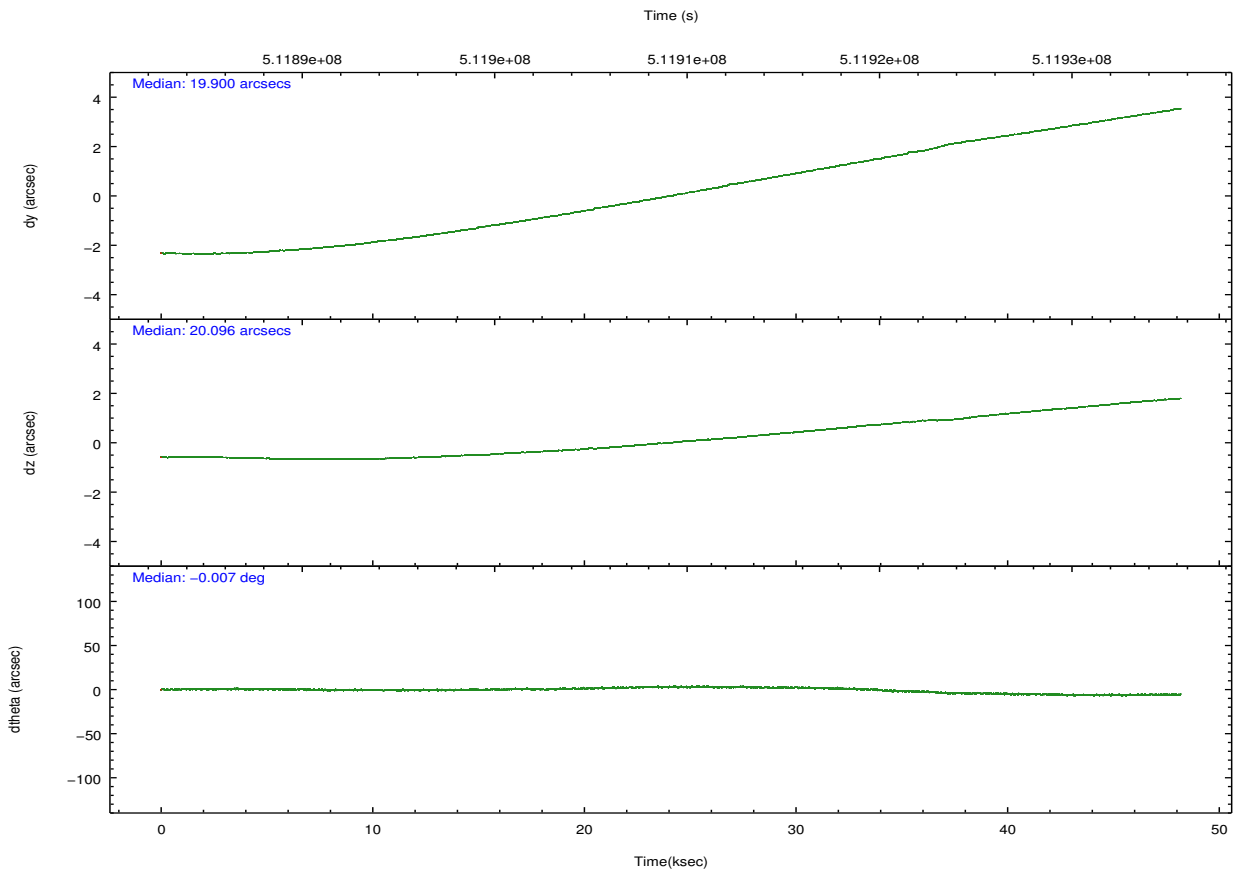
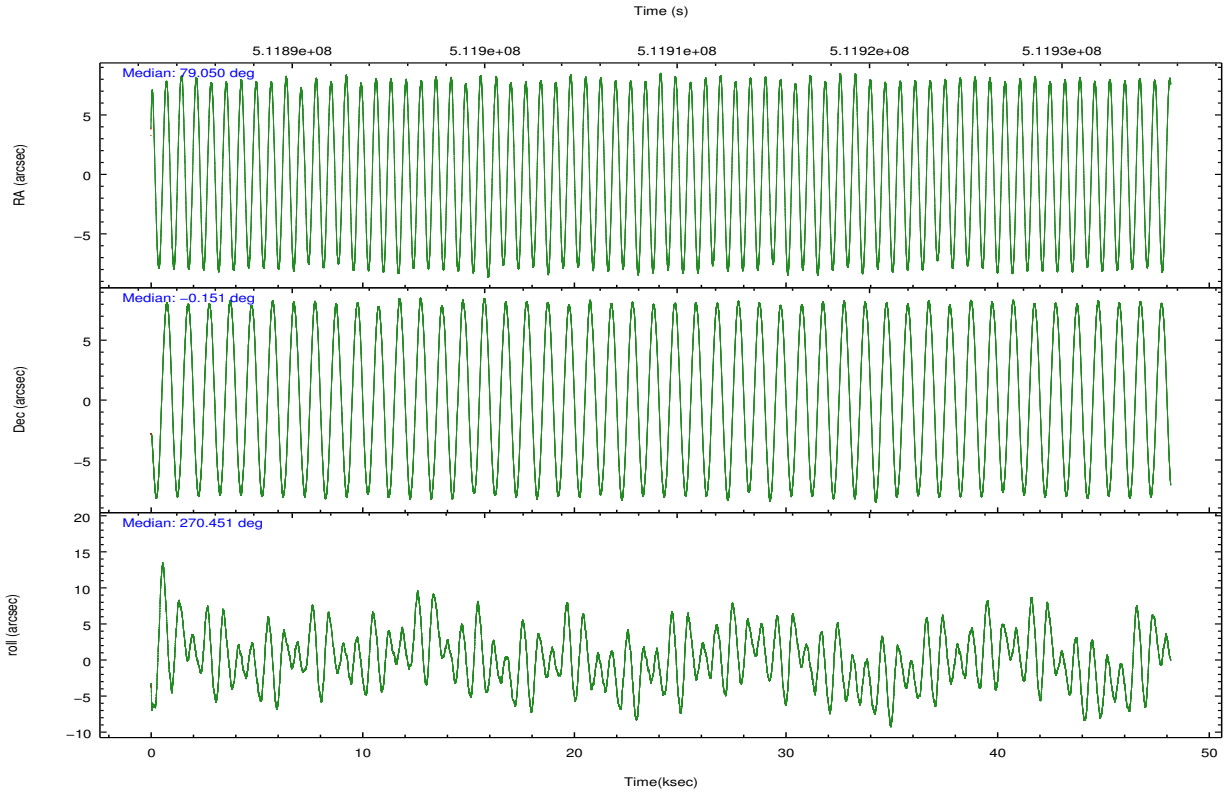
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	206223	324008	196423	278001	243251	173637	grade 0 events	22564	47456	27770	17299	29191	9696
rejected events	168925	147389	148755	136393	166512	148976		10%	14%	14%	6%	12%	5%
rejected %	81%	45%	75%	49%	68%	85%	grade 1 events	192	2923	130	620	176	86
								0%	0%	0%	0%	0%	0%
							grade 2 events	5915	43033	7904	30438	16404	5225
								2%	13%	4%	10%	6%	3%
							grade 3 events	2445	6560	3129	13339	6705	2427
								1%	2%	1%	4%	2%	1%
							grade 4 events	2349	6391	3199	13071	6517	2389
								1%	1%	1%	4%	2%	1%
							grade 5 events	8857	22568	8742	26344	12684	9768
								4%	6%	4%	9%	5%	5%
							grade 6 events	4027	73191	5670	67487	17928	4925
								1%	22%	2%	24%	7%	2%
							grade 7 events	159874	121886	139879	109403	153646	139121
								77%	37%	71%	39%	63%	80%

## 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	79.035886	79.05006511704278	CCD I2 on	N	N
[deg] Pointing Dec	-0.128120	-0.1514981855159507	CCD I3 on	N	N
[deg] Pointing Roll	270.299980	270.4566384669728	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	-187.132523	-187.1254020033014	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-3	-3.007120579706367	CCD S4 on	Y	Y
[s] Observation start time (MET)	511885233.184000	511883779.00209	CCD S5 on	O2	Y
Observation start date	2014-03-22T14:19:26	2014-03-22T13:56:19	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	511933233.184000	511934477.55489	On-chip summing requested	N	N
Observation end date	2014-03-23T03:39:26	2014-03-23T04:01:17	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	2.5

## 2.3 Aspect





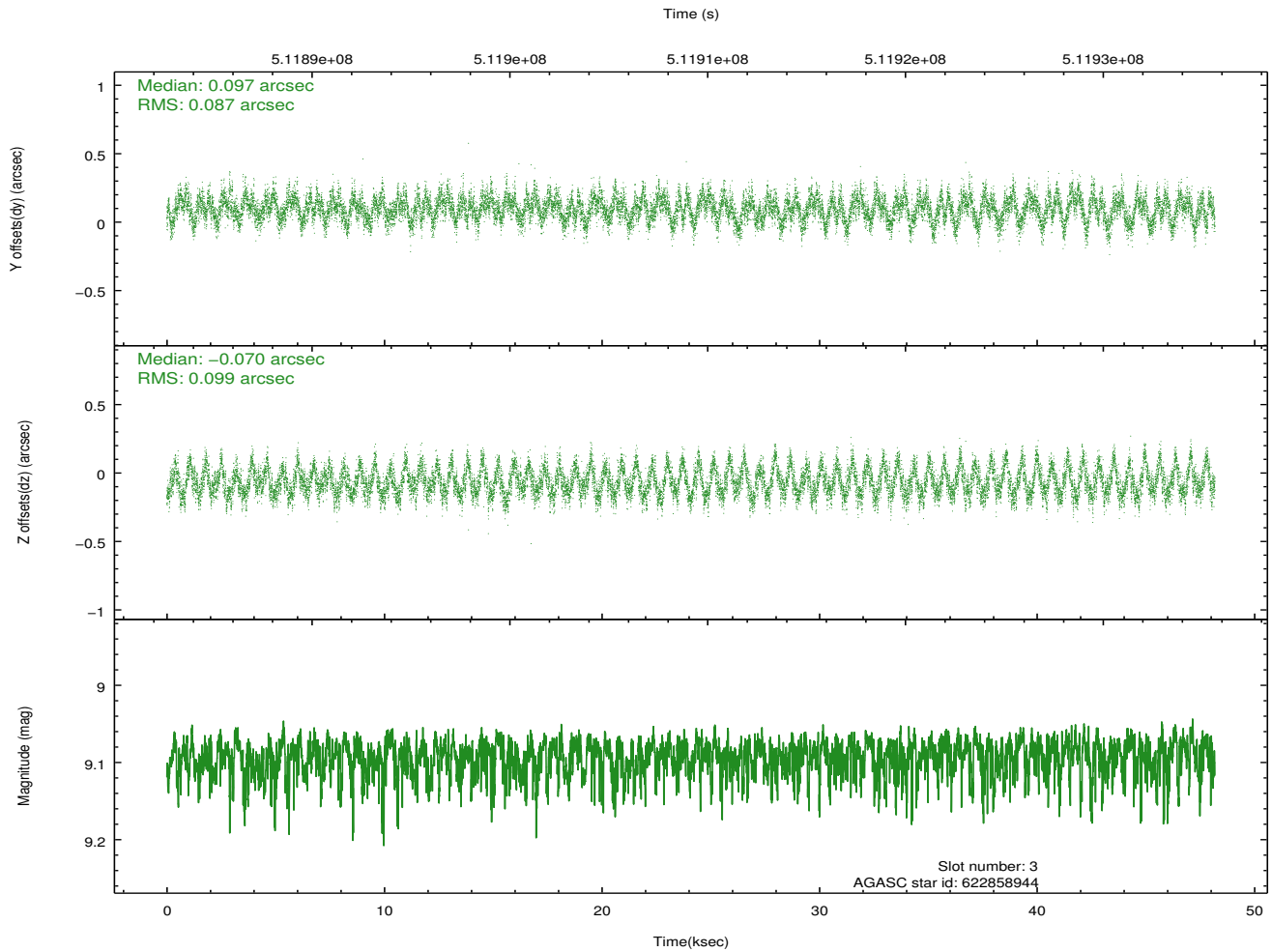
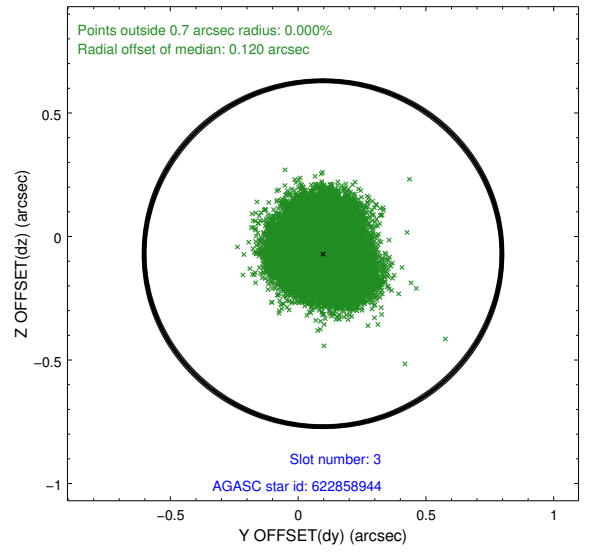
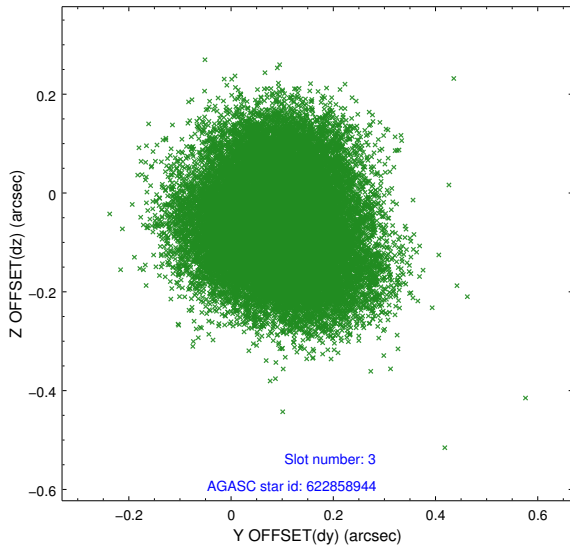
### Slot Statistics

slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-1	7.01	11753	0.042	0.044	0.055	0.069	0.000000	0.000000	923.15	-1799.48
1	FID		ACIS-S-5	7.05	11754	-0.154	0.021	0.031	0.042	0.000000	0.000000	-1826.09	98.00
2	FID		ACIS-S-6	7.18	11752	0.104	-0.051	0.037	0.076	0.000000	0.000000	388.72	741.93
3	GUIDE	used	622858944	9.09	23497	0.097	-0.070	0.143	0.216	79.047245	-0.768681	2305.25	30.83
4	GUIDE	used	622865136	9.37	23492	0.041	-0.021	0.134	0.212	78.757490	-0.306389	637.15	-1005.45
5	GUIDE	used	622865280	9.36	23478	0.001	-0.040	0.136	0.218	79.432455	-0.370100	878.89	1423.12
6	GUIDE	used	622865680	8.44	23500	-0.246	-0.006	0.106	0.163	79.366255	-0.345462	789.85	1185.66
7	GUIDE	used	12981512	9.60	23479	0.108	0.121	0.182	0.274	78.741819	0.436531	-2037.65	-1047.96

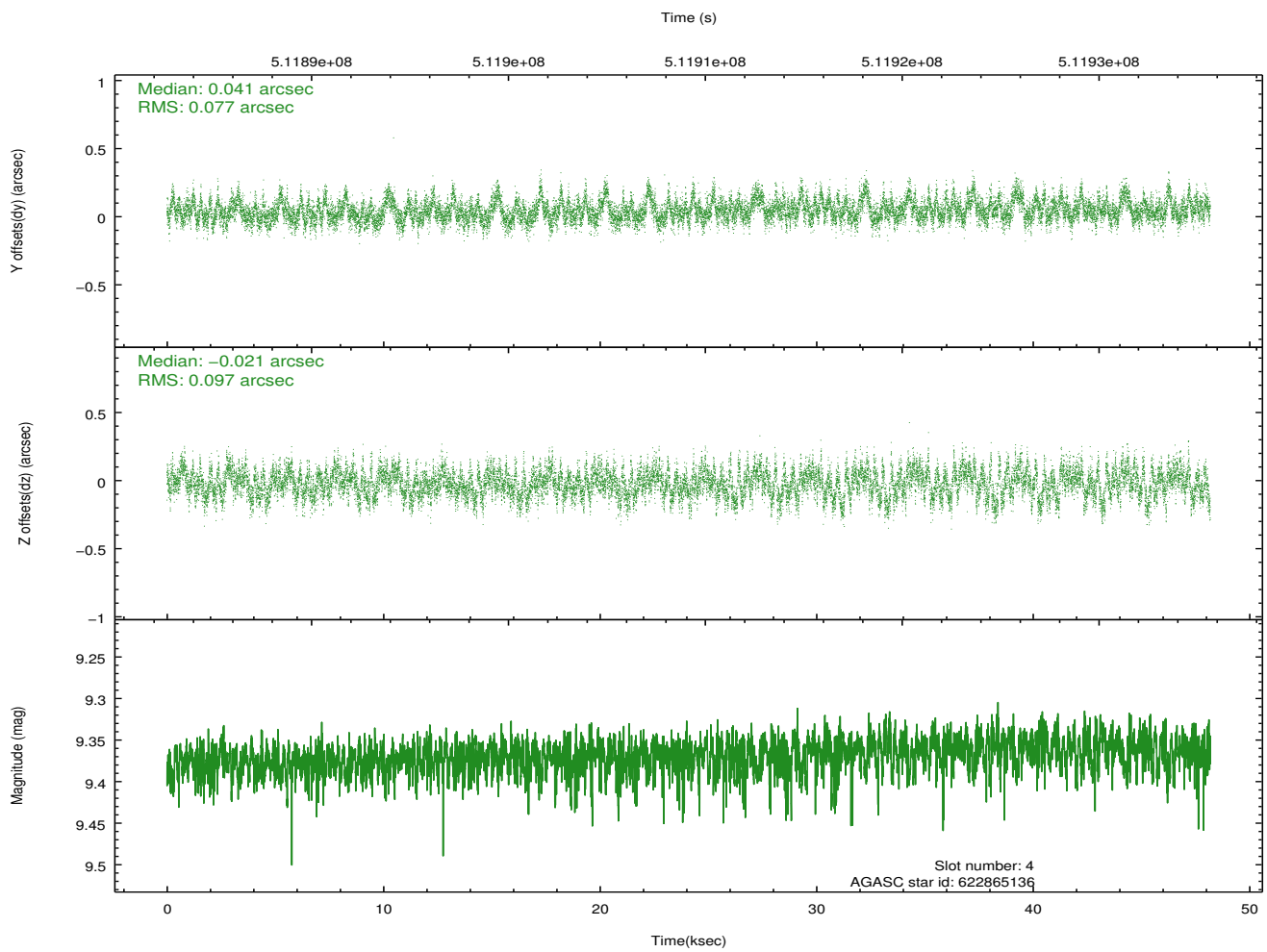
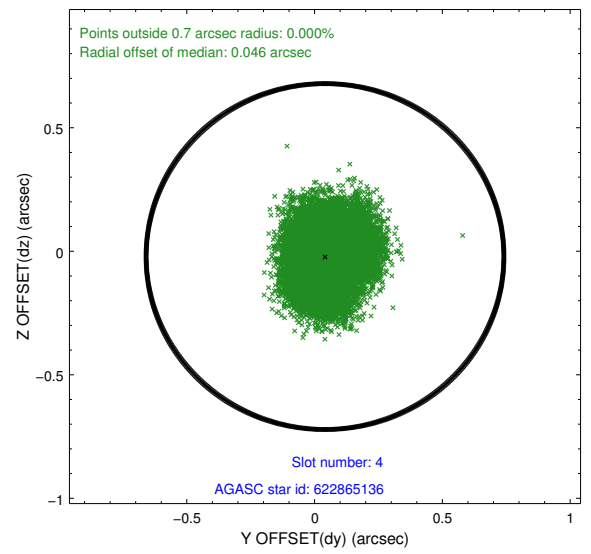
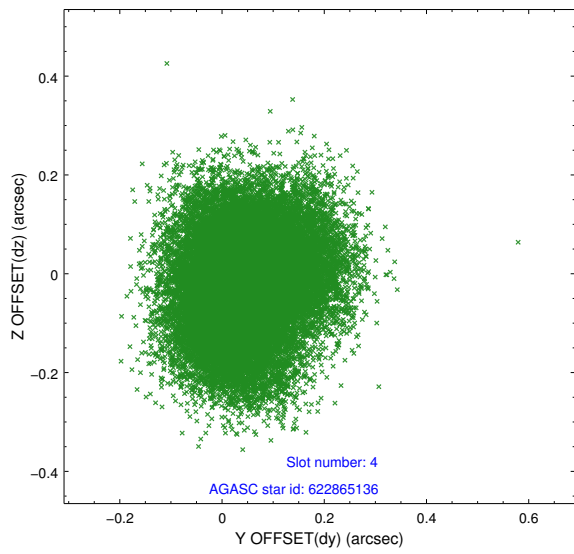
∞

## 2.4 Star Slots

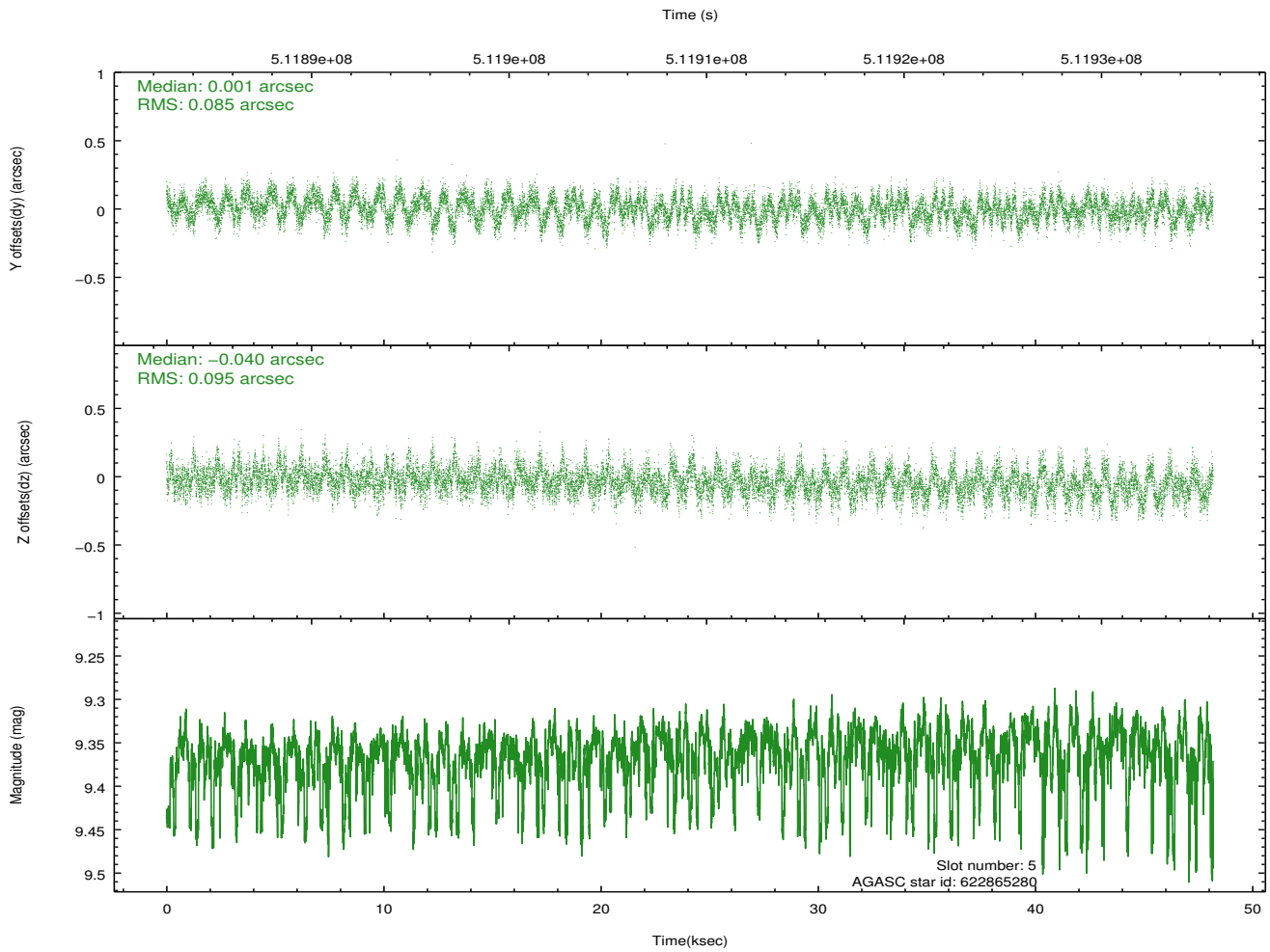
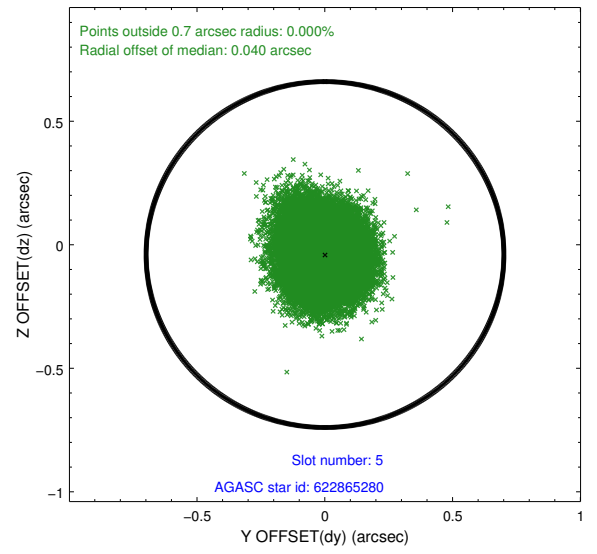
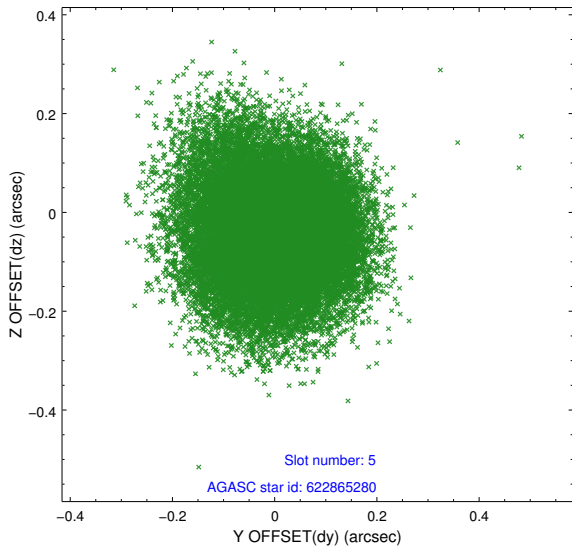
### 2.4.1 Slot 3



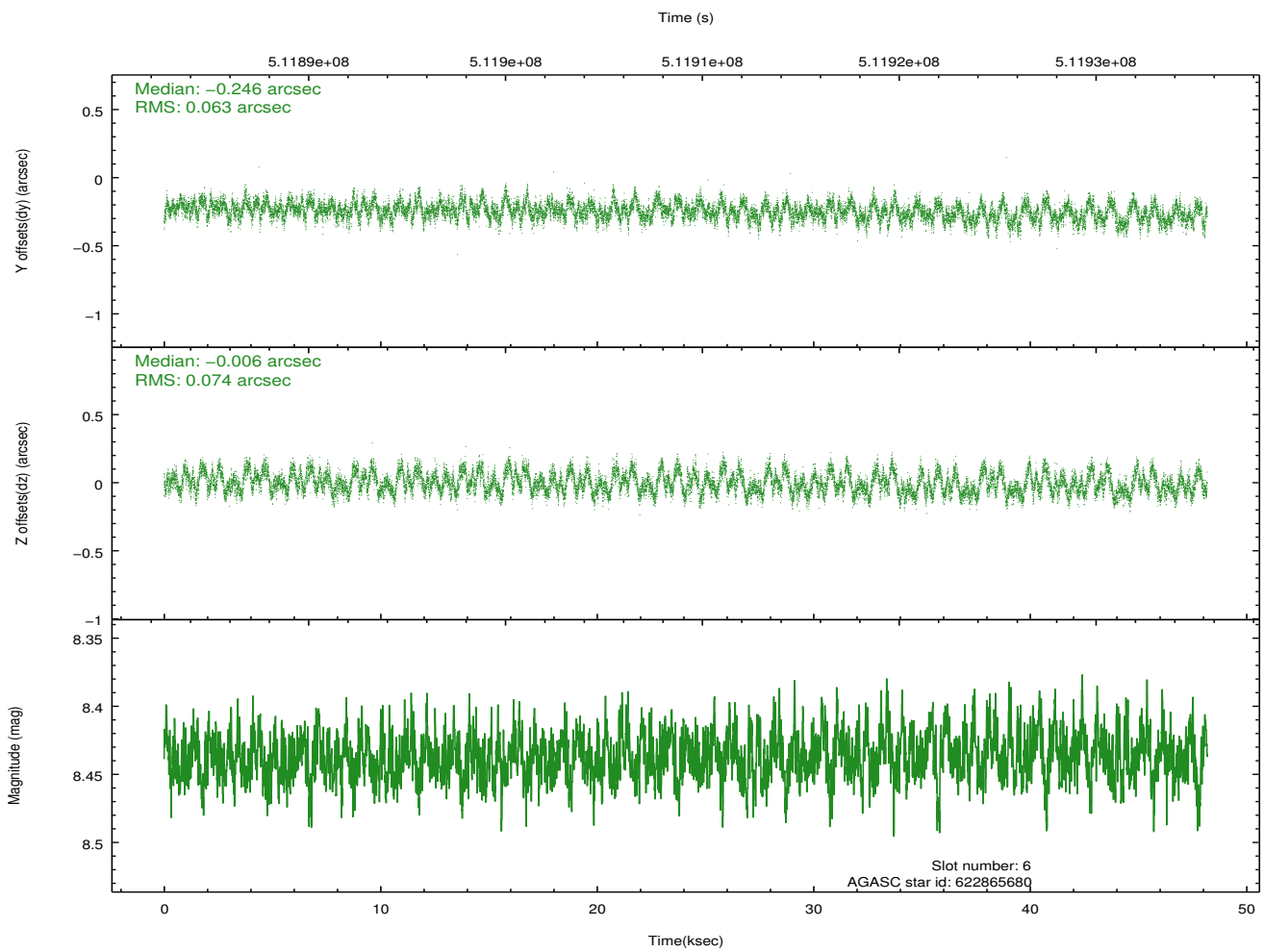
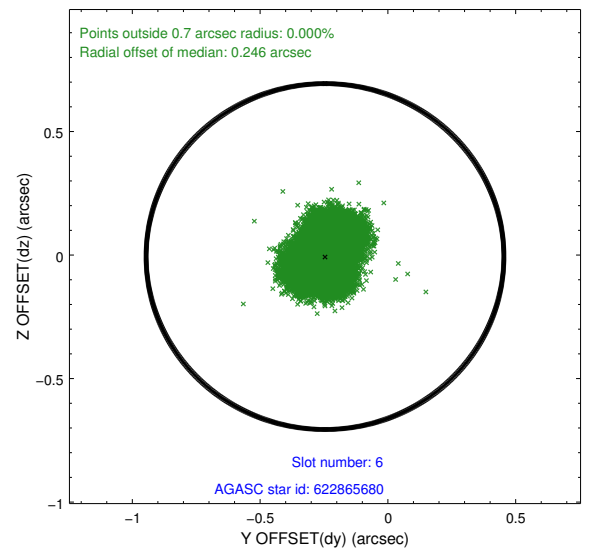
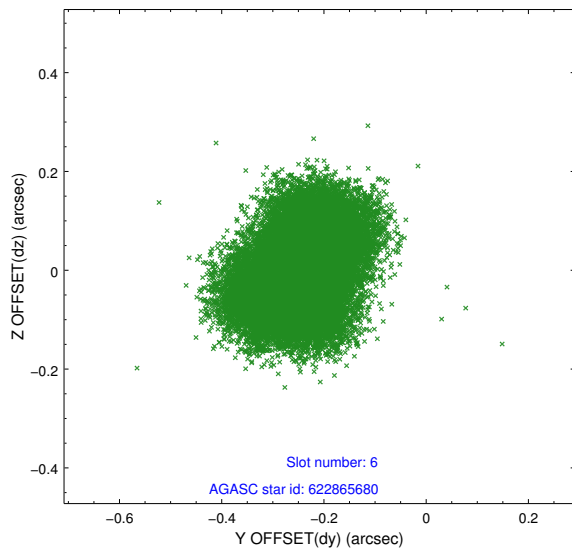
## 2.4.2 Slot 4



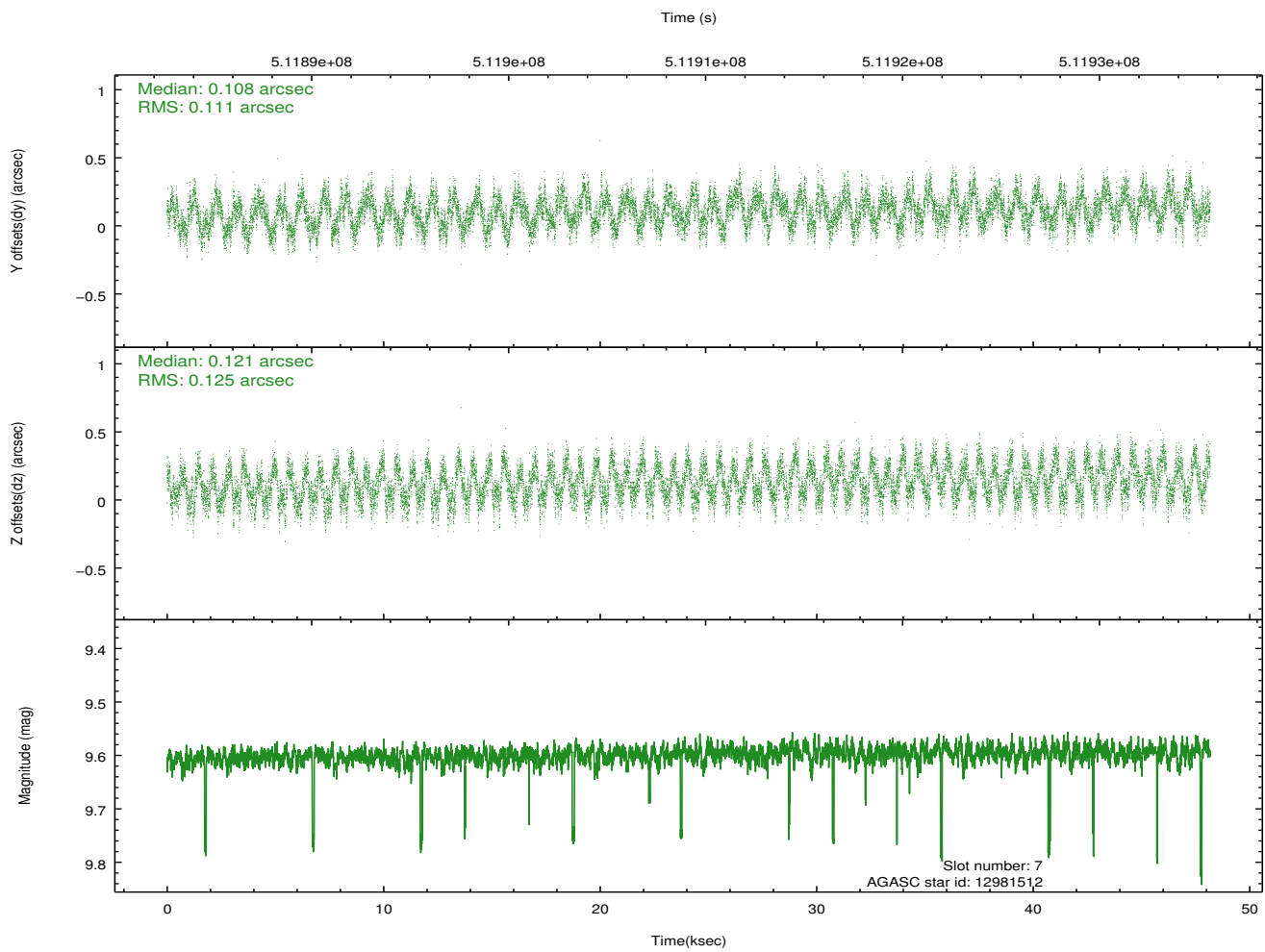
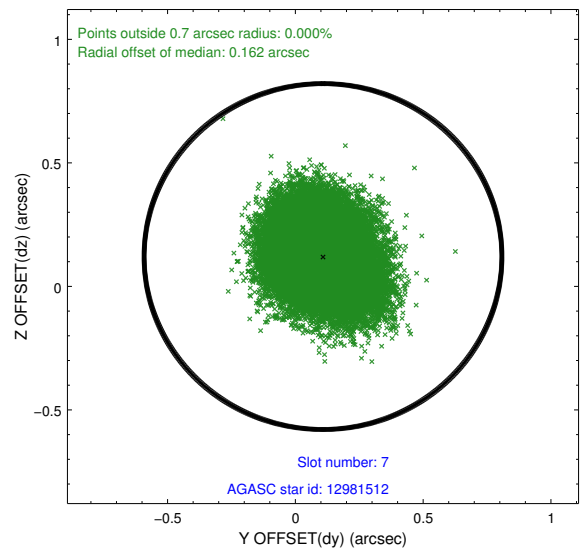
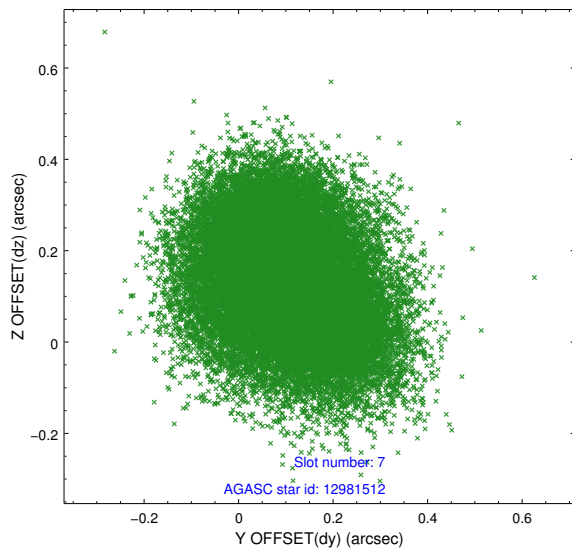
### 2.4.3 Slot 5



## 2.4.4 Slot 6

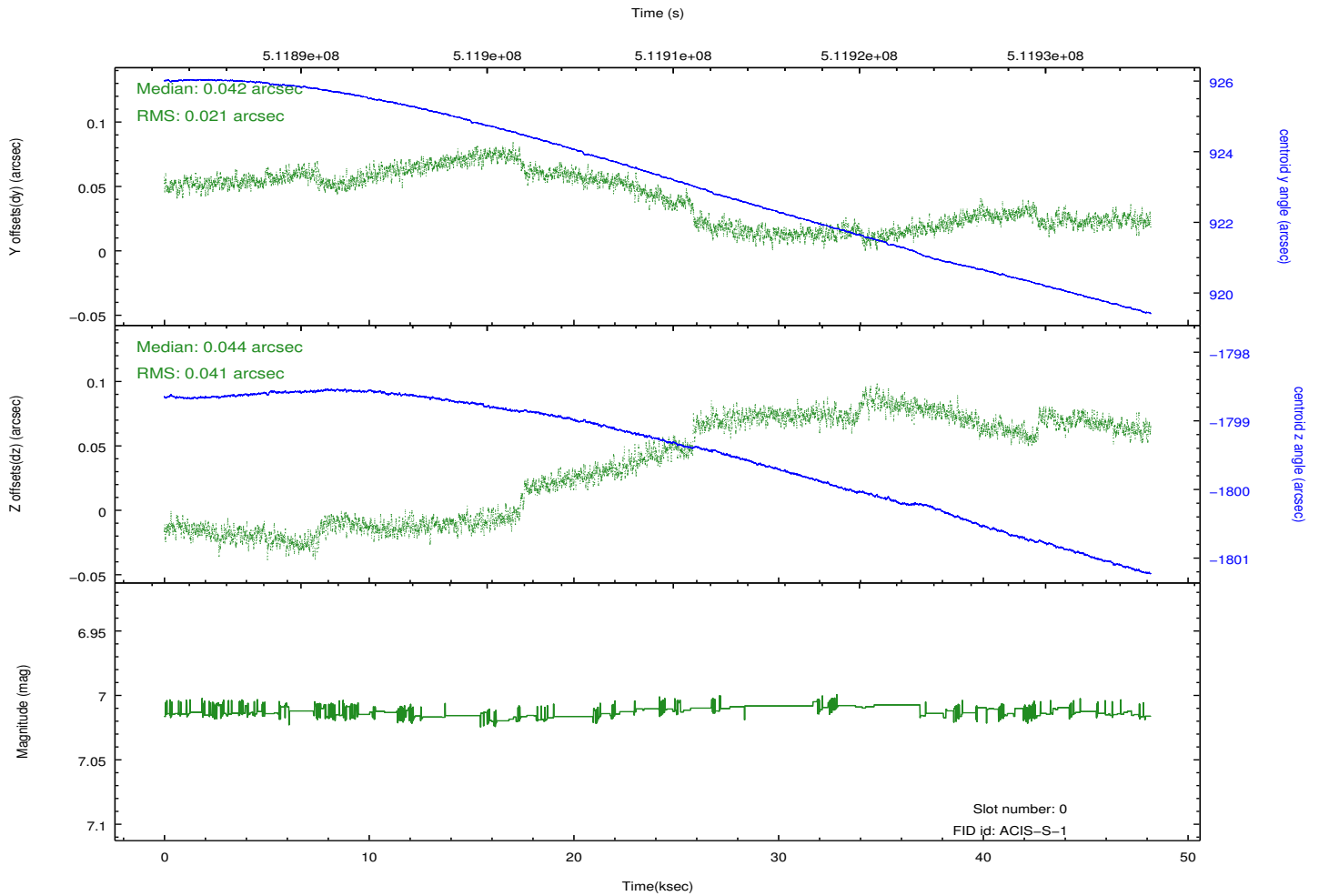
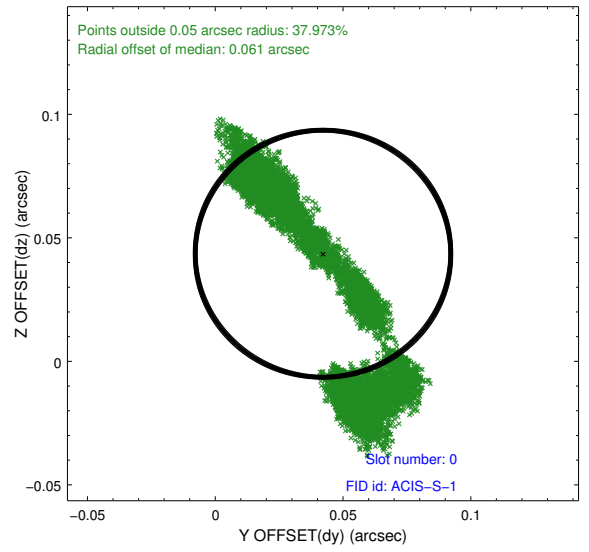
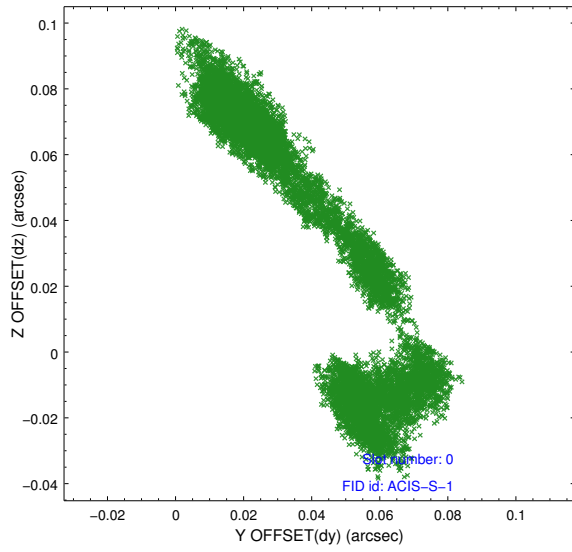


## 2.4.5 Slot 7

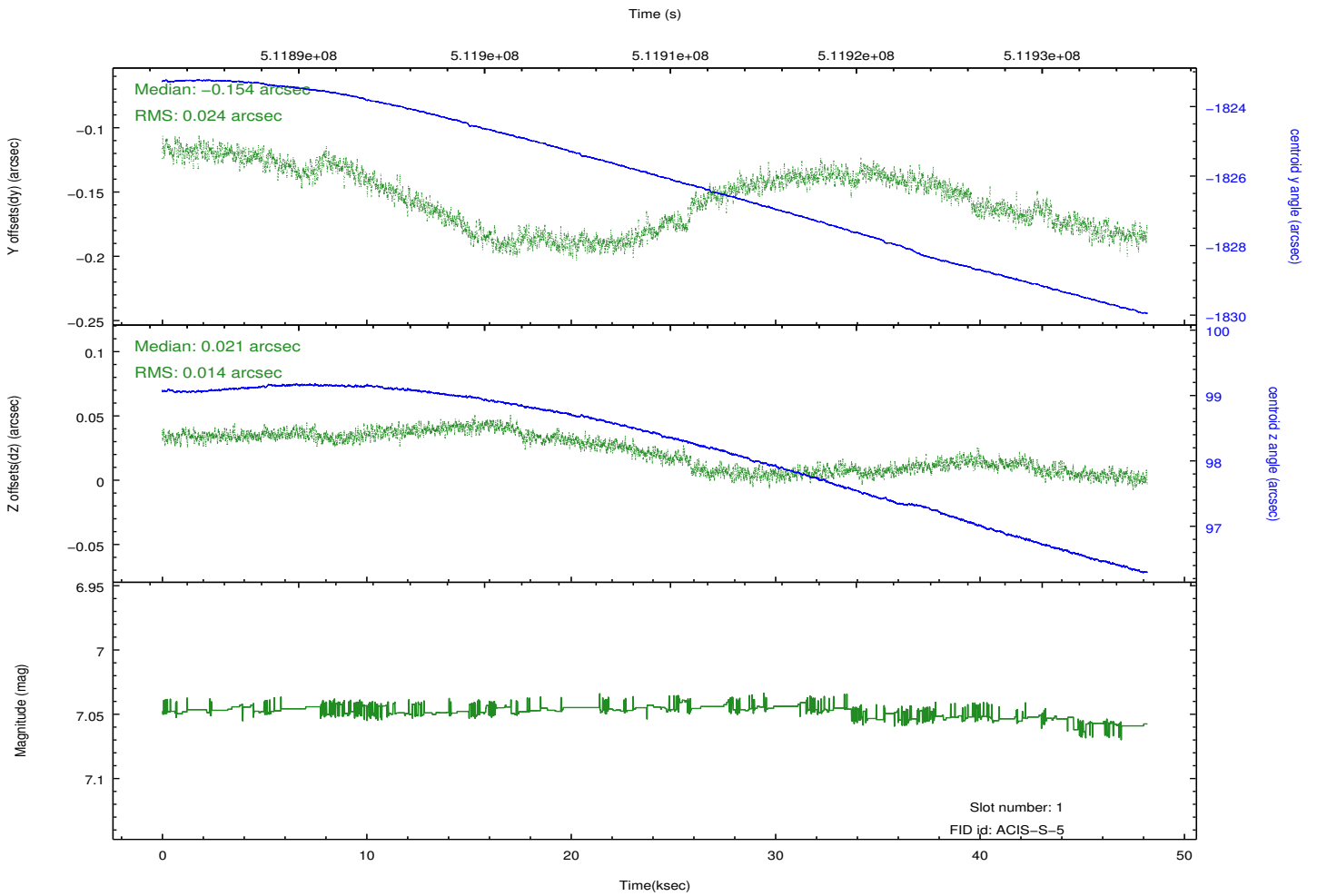
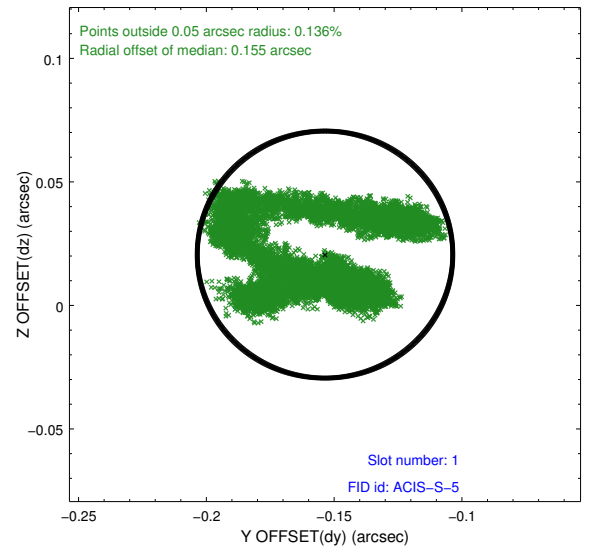
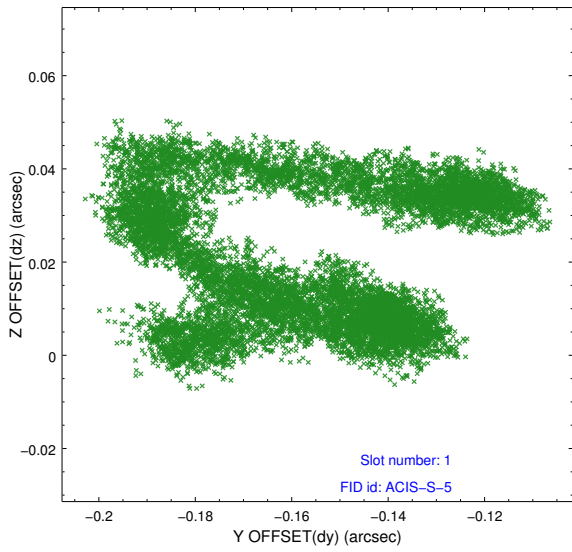


## 2.5 FID Slots

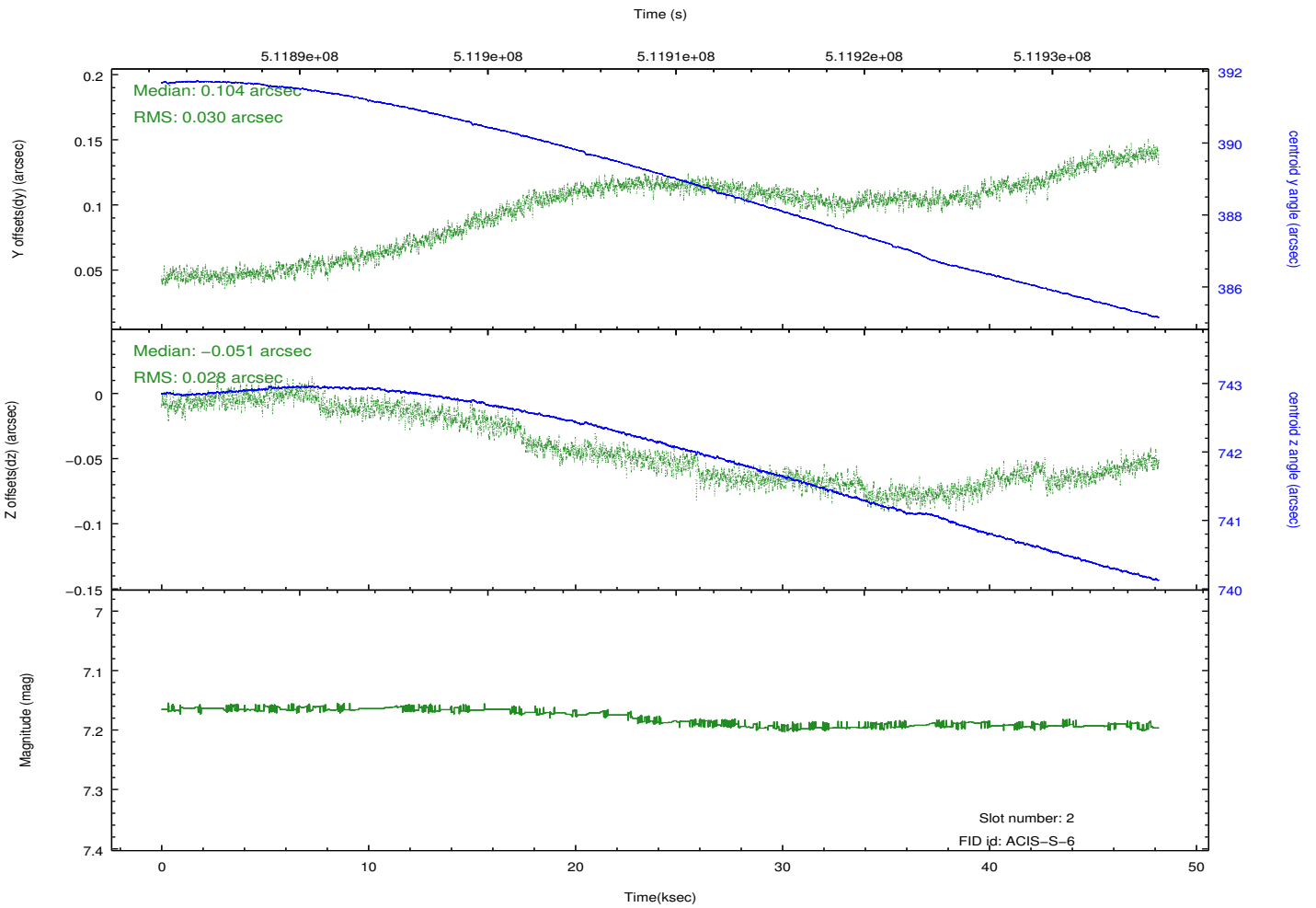
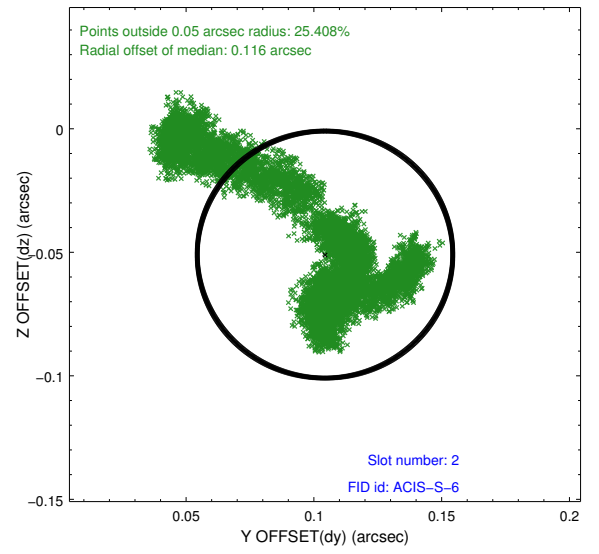
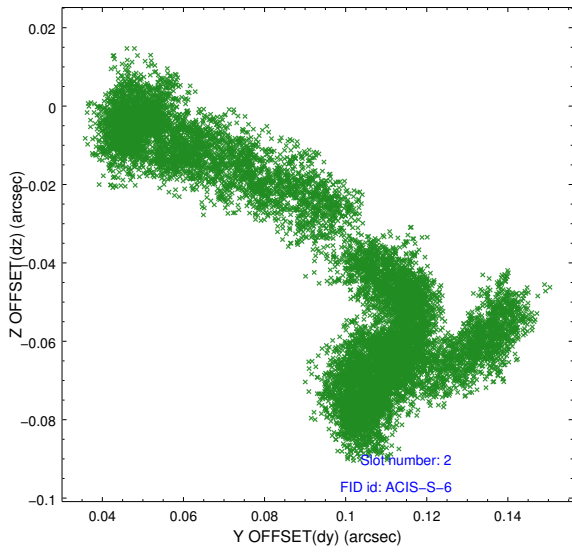
### 2.5.1 Slot 0



## 2.5.2 Slot 1

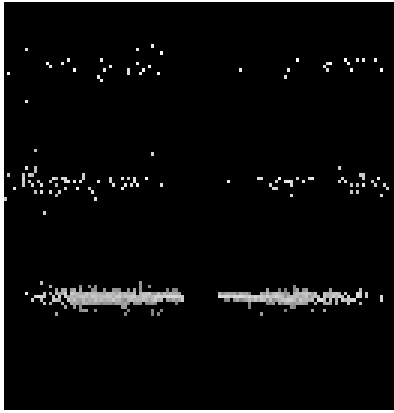


### 2.5.3 Slot 2

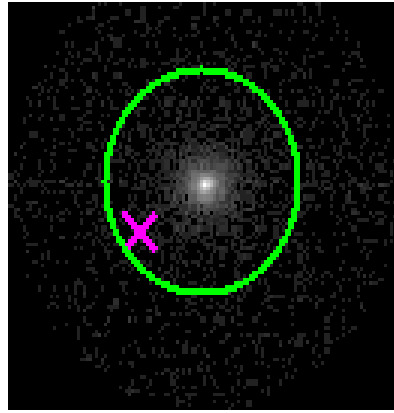


### 3 Gratings

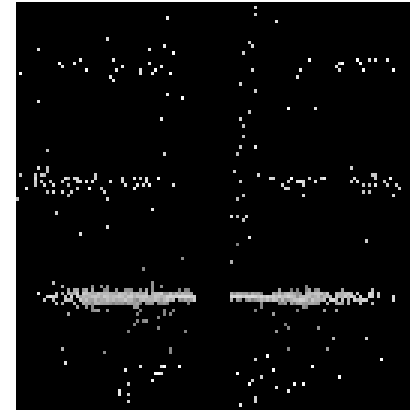
#### 3.1 HEG Arm



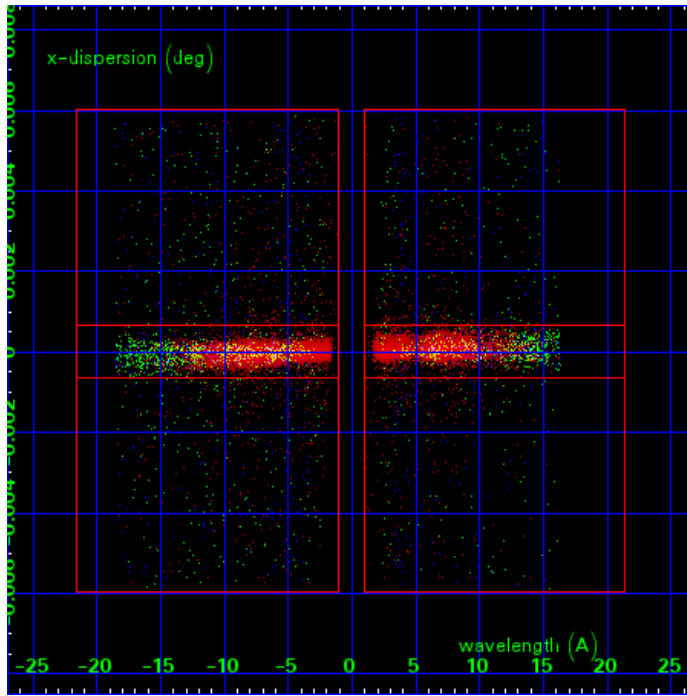
HEG Order Sort 123



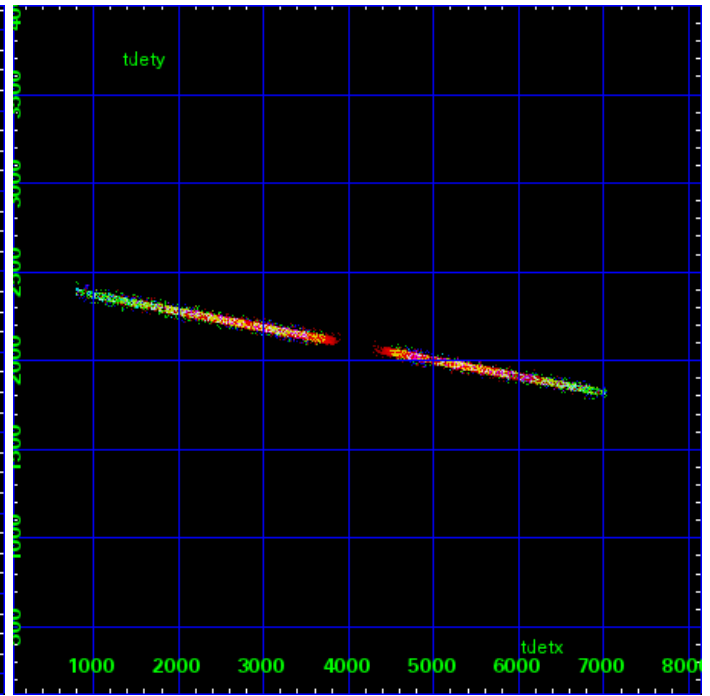
HEG Zero Order



HEG Order Sort ALL

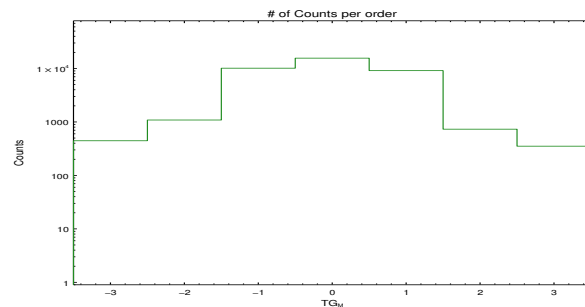


Spot Image HEG

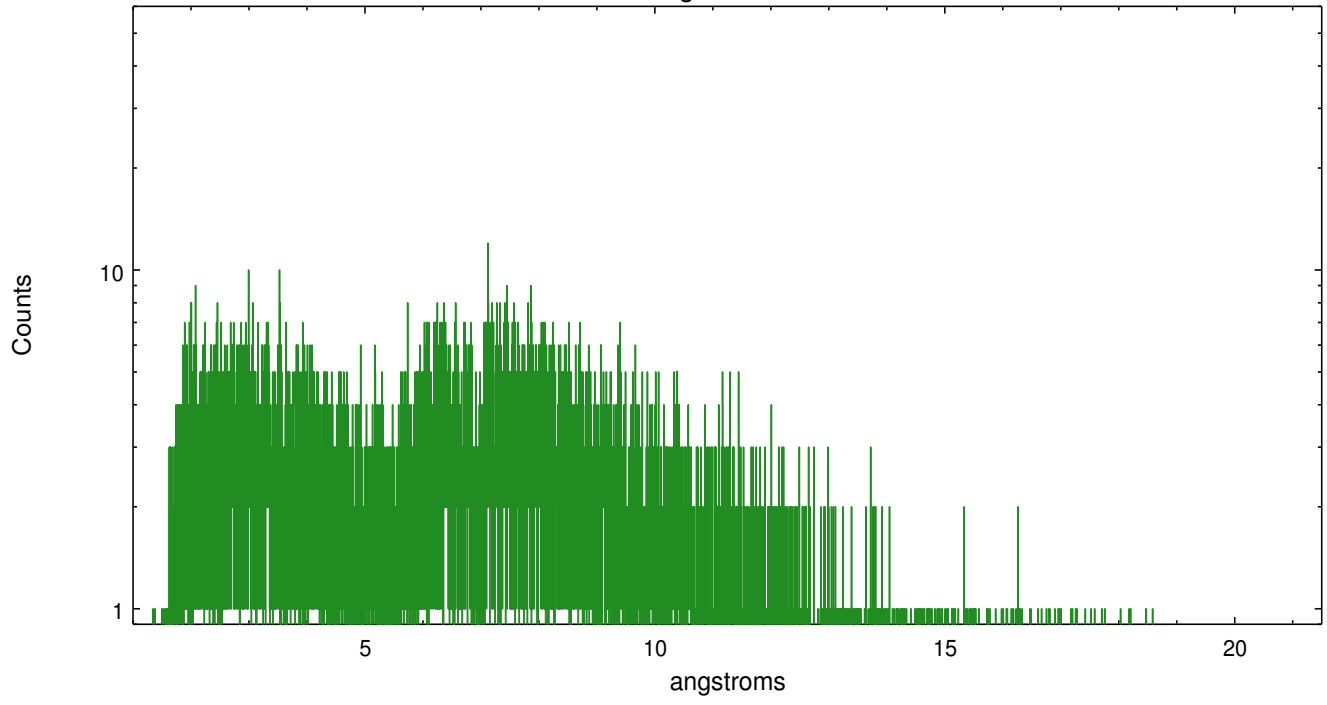


Full Detector HEG

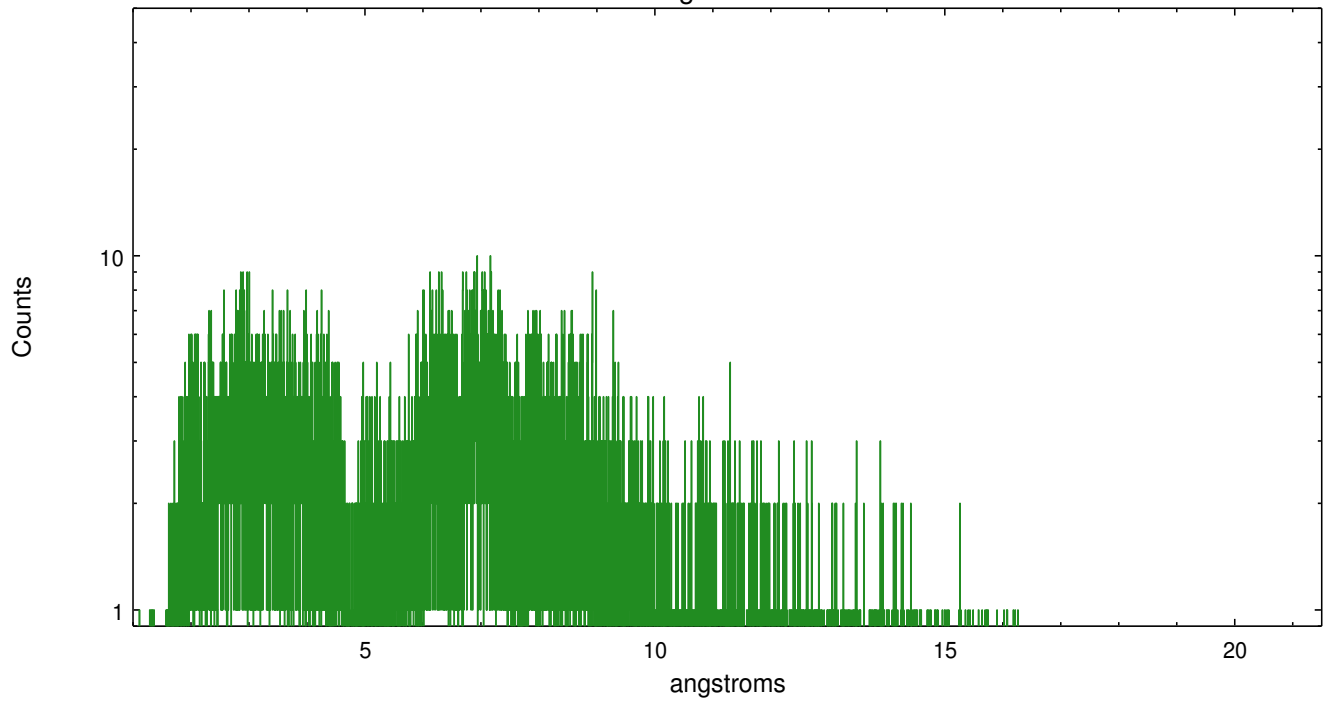
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	445	1087	10123	15602	9119	732	352



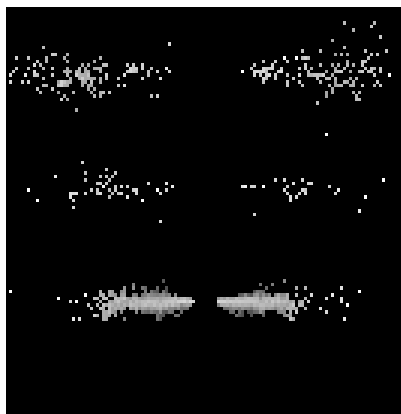
heg order -1



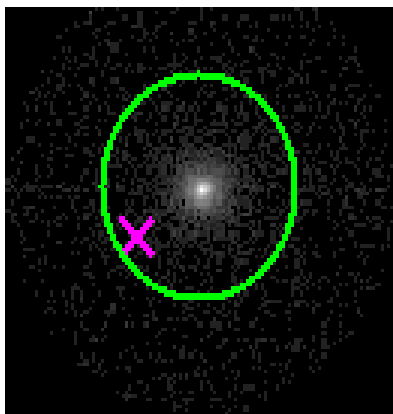
heg order +1



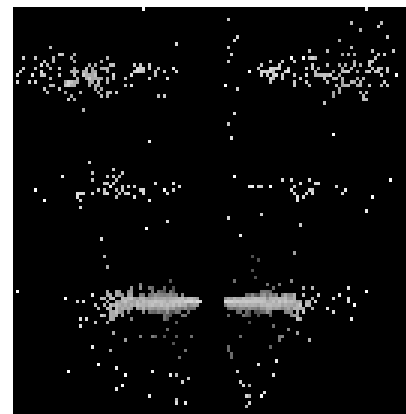
### 3.2 MEG Arm



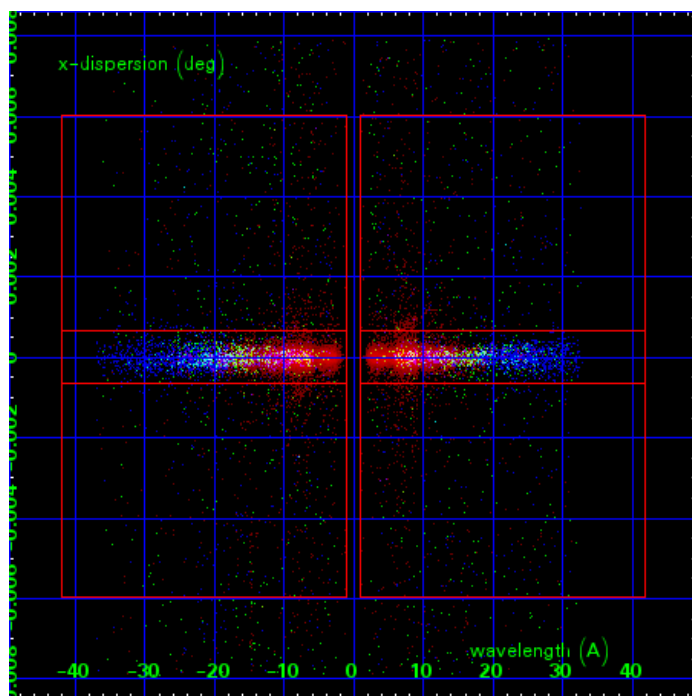
MEG Order Sort 123



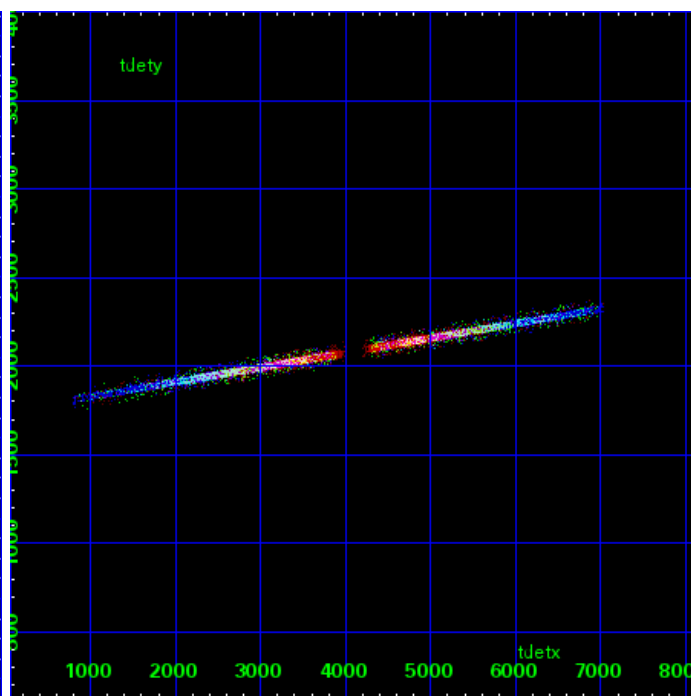
MEG Zero Order



MEG Order Sort ALL

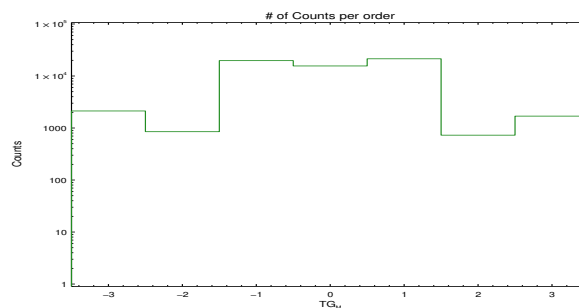


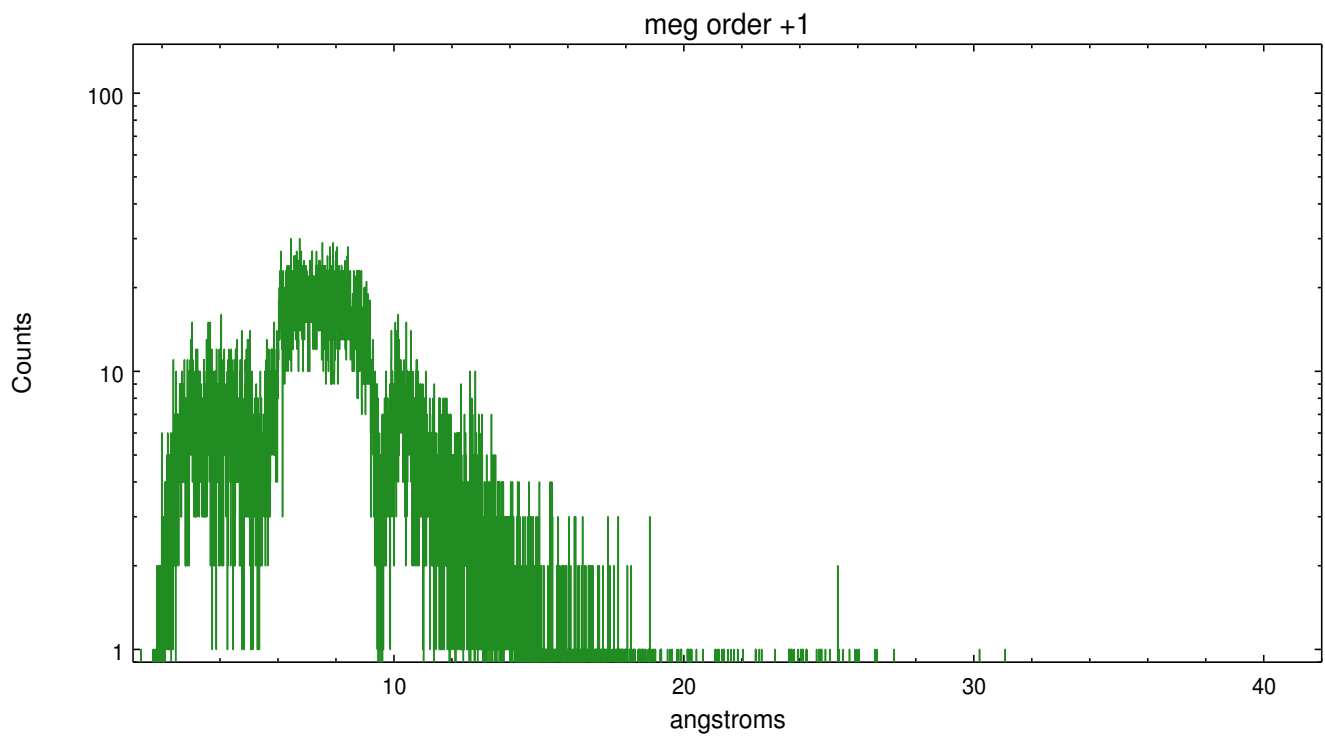
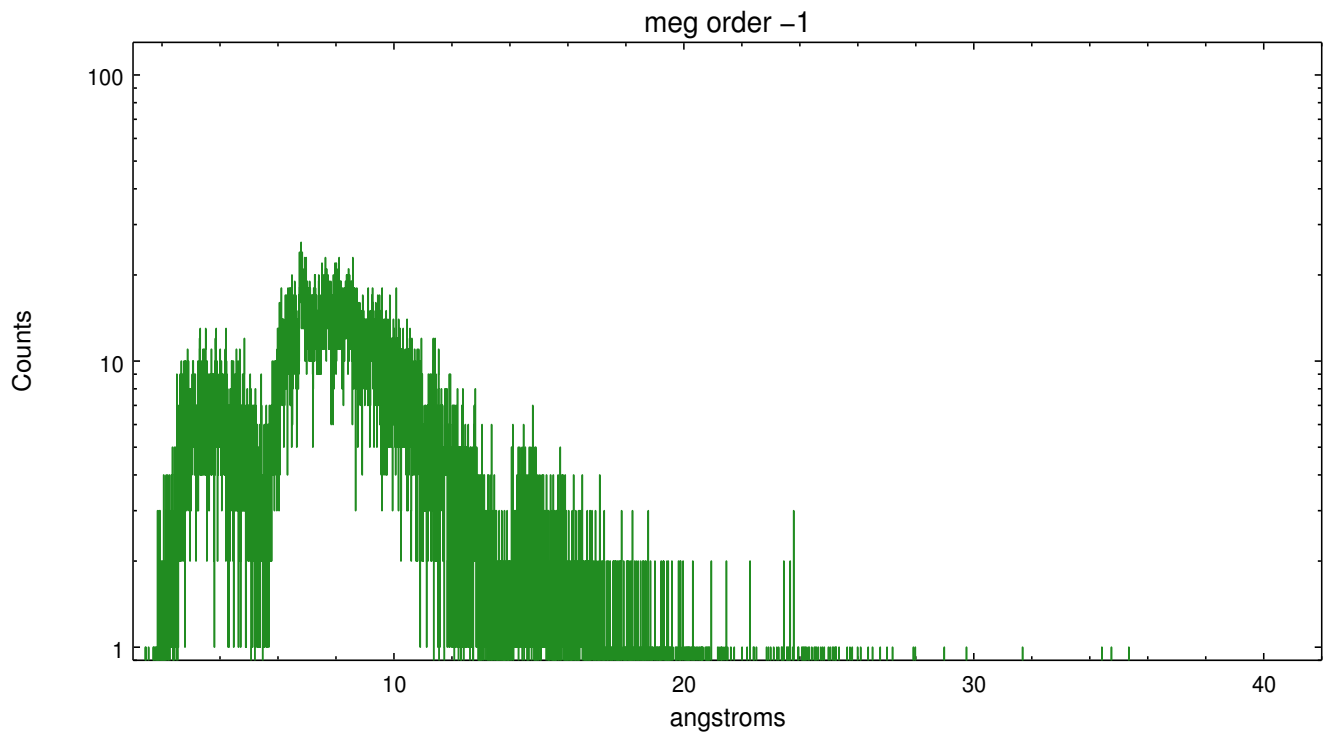
Spot Image MEG



Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	2127	850	19752	15602	21428	728	1692





# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2015.10.16
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	48.0325

## A.2 Comments

These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.

====

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 dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case.