

# V&V Reference Report

## L2 ASCDS Version : 10.4.3.1

Observation 18621 - L2 Version 1  
Chandra X-Ray Center

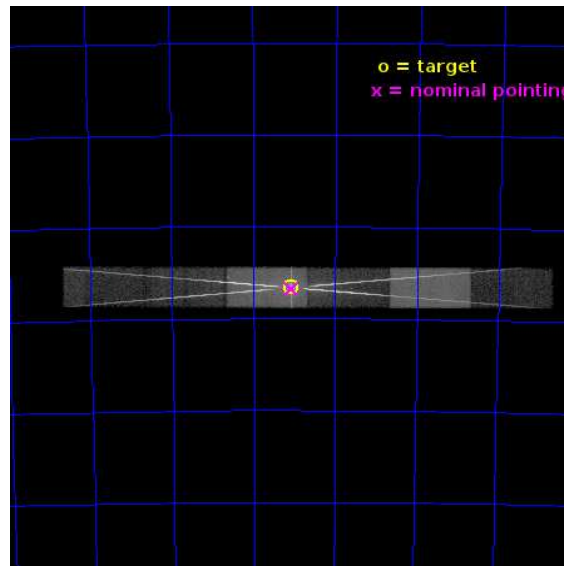
L2 Processing Date : Apr 2 2016

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# 1 Front

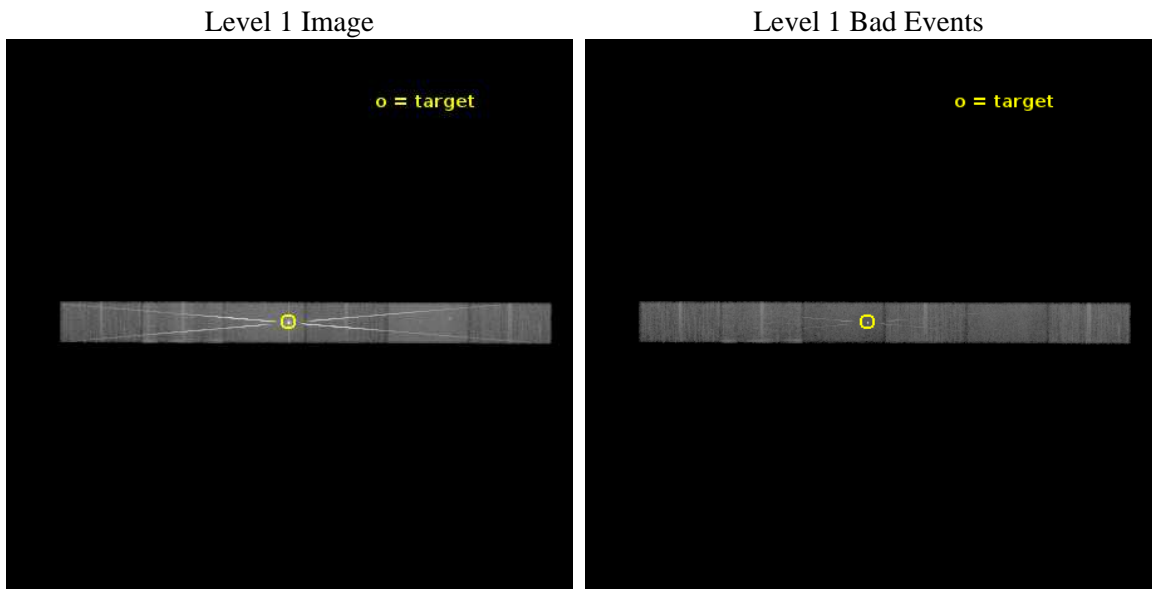
seq_num	401813	Sequence number
obs_id	18621	Observation id
title	Ionization and Reflection Physics in SMC X-1	Proposal title
observer	Claude Canizares	Principal investigator
object	SMC X-1	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	19.27125	Observer's specified target RA [deg]
dec_targ	-73.443333	Observer's specified target Dec [deg]
ra_nom	19.26834856429	Nominal RA [deg]
dec_nom	-73.445924778891	Nominal Dec [deg]
roll_nom	180.15384886655	Nominal Roll [deg]
revision	1	Processing version of data
ontime	32359.50090766	Sum of GTIs [s]
livetime	31596.718939841	Livetime [s]
ontime4	32359.50090766	Sum of GTIs [s]
ontime5	32359.50090766	Sum of GTIs [s]
ontime6	32359.50090766	Sum of GTIs [s]
ontime7	32359.50090766	Sum of GTIs [s]
ontime8	32359.47821784	Sum of GTIs [s]
ontime9	32359.437177896	Sum of GTIs [s]
l2events	574897	Number of level 2 events



## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



### 2.1.2 Parameters

obi_num	2	Obi number	sched_exp_time	32326.171000	[s] Scheduled observation exposure time
ascdsver	10.4.3.1	Processing system revision	ontime	32359.50090766	Sum of GTIs [s]
caldbver	4.7.1	&#160	ontime4	32359.50090766	Sum of GTIs [s]
date	2016-04-02T19:36:53	Date and time of file creation	ontime5	32359.50090766	Sum of GTIs [s]
revision	1	Processing version of data	ontime6	32359.50090766	Sum of GTIs [s]
			ontime7	32359.50090766	Sum of GTIs [s]
			ontime8	32359.47821784	Sum of GTIs [s]
			ontime9	32359.437177896	Sum of GTIs [s]
			l1events	1188932	Number of level 1 events
			tgmethod	FINDZO	Method used to create src1a file
			z0_pos	(4000.17, 4114.48)	src1a sky level position

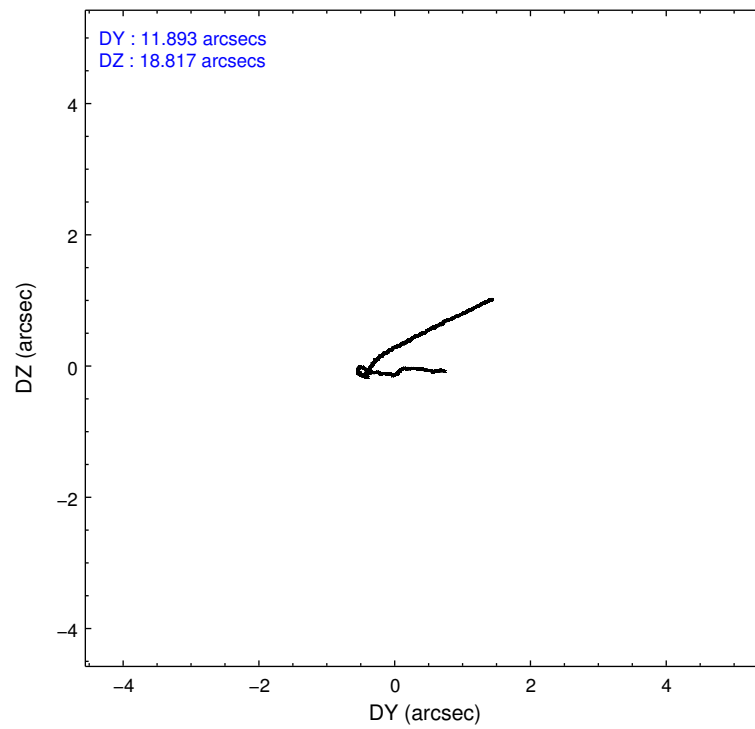
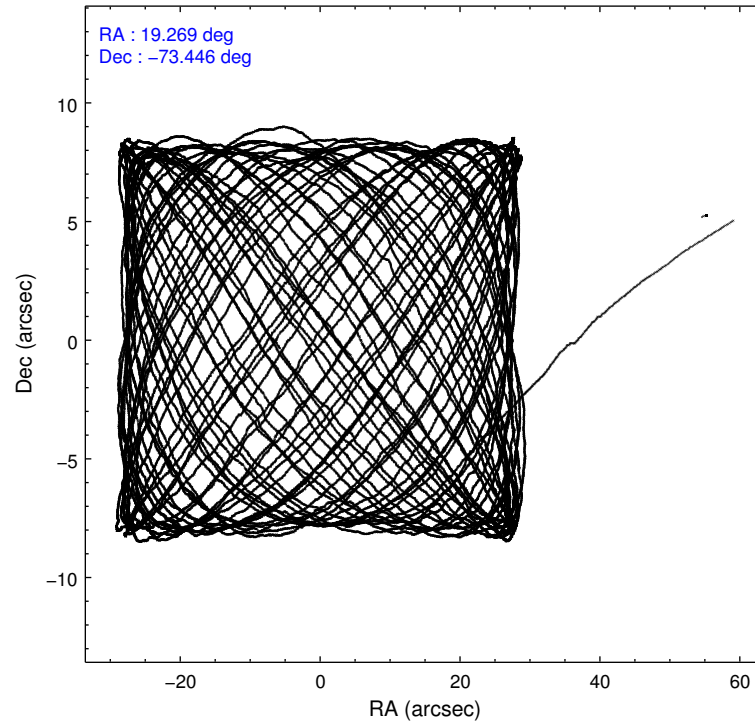
### 2.1.3 Events

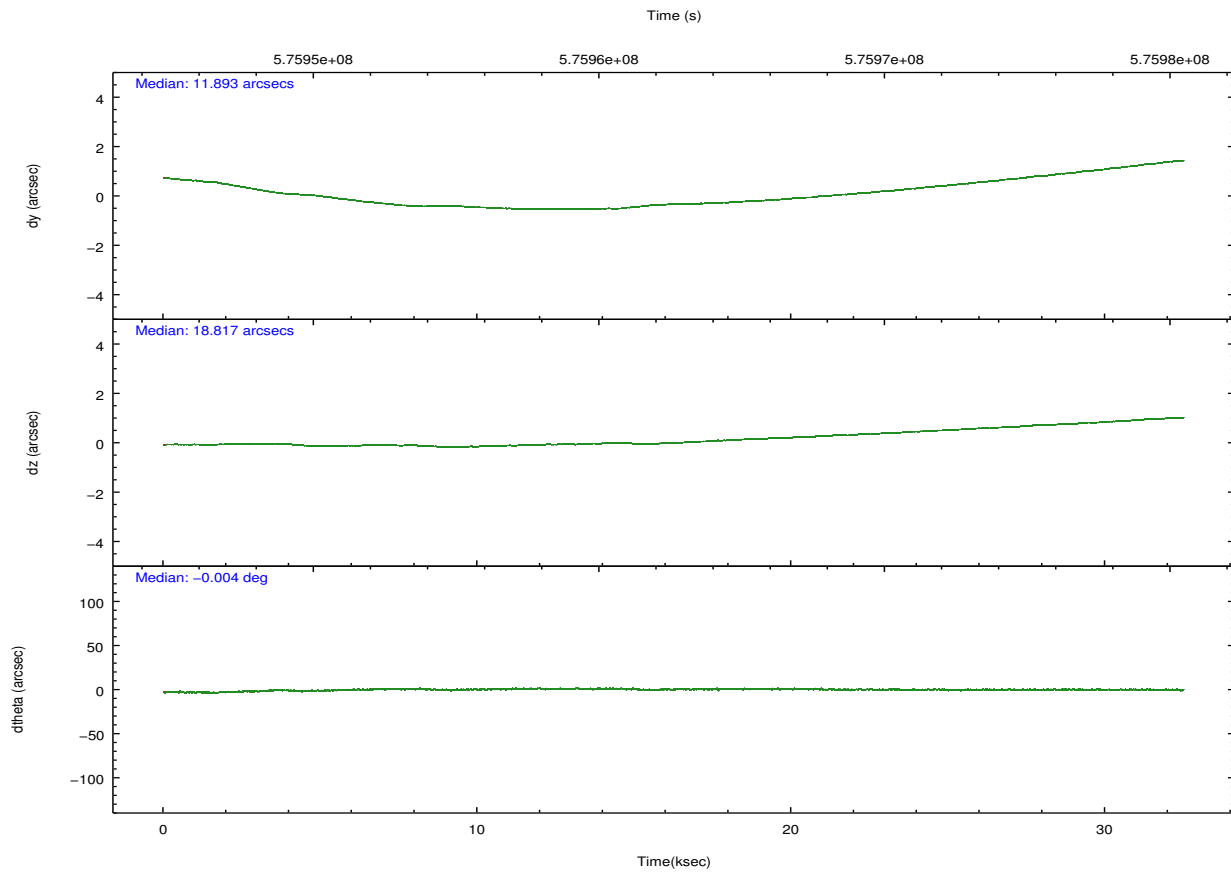
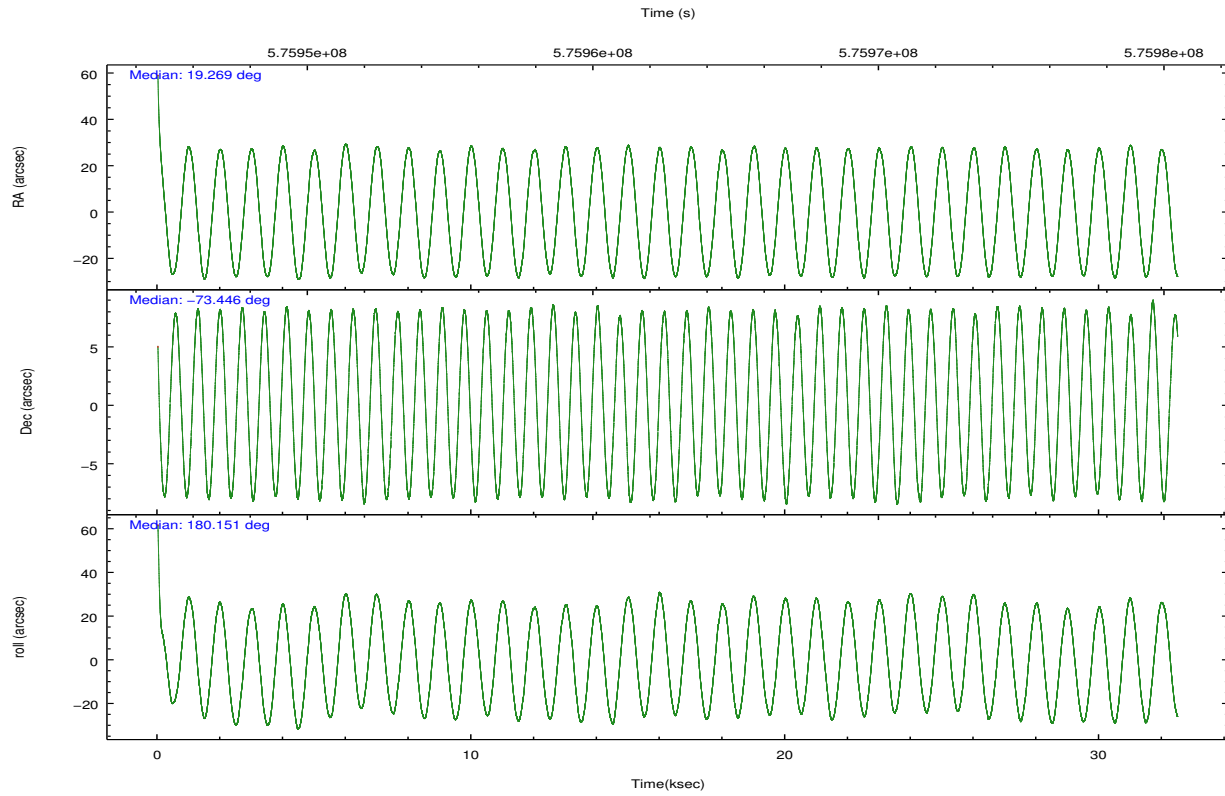
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	122903	189061	258261	318073	191744	108890	grade 0 events	7814	11862	112035	36299	50800	10965
rejected events	104550	86144	96480	84985	103537	86762		6%	6%	43%	11%	26%	10%
rejected %	85%	45%	37%	26%	53%	79%	grade 1 events	47	226	614	630	175	56
								0%	0%	0%	0%	0%	0%
							grade 2 events	4682	33304	23606	63653	14190	4440
								3%	17%	9%	20%	7%	4%
							grade 3 events	1419	4610	7412	20032	5871	1678
								1%	2%	2%	6%	3%	1%
							grade 4 events	1346	4446	7350	19786	5633	1651
								1%	2%	2%	6%	2%	1%
							grade 5 events	3898	9561	5141	13558	6860	4800
								3%	5%	1%	4%	3%	4%
							grade 6 events	3094	48699	11384	93329	11721	3399
								2%	25%	4%	29%	6%	3%
							grade 7 events	100603	76353	90719	70786	96494	81901
								81%	40%	35%	22%	50%	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	GRADED	GRADED	CCD I0 on	N	N
Observation mode	POINTING	POINTING	CCD I1 on	N	N
[deg] Pointing RA	19.350931	19.26834856429	CCD I2 on	N	N
[deg] Pointing Dec	-73.431803	-73.44592477889053	CCD I3 on	N	N
[deg] Pointing Roll	180.076381	180.1538488665487	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	-183.9900508222561	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-6.14	-6.142471760751675	CCD S4 on	Y	Y
Phase constraints	Y	Y	CCD S5 on	Y	Y
[d] Phase period	3.891782	3.891782	Number of optional ACIS chips dropped	0	0
[d] Phase epoch (MJD)	57092.711423	57092.711423	On-chip summing requested	N	N
Phase start	0.170000	0.170000	Subarray requested	CUSTOM	1/2
Phase end	0.830000	0.830000	Subarray start row	1	1
Phase start error	0.020000	0.020000	Subarray row count	512	512
Phase end error	0.020000	0.020000	Alternating exposures requested	N	N
[s] Observation start time (MET)	575946564.184000	575944989.76548	[s] Primary exposure time	0.000000	1.7
Observation start date	2016-04-02T01:08:16	2016-04-02T00:43:09			
[s] Observation end time (MET)	575978890.184000	575979106.8924201			
Observation end date	2016-04-02T10:07:02	2016-04-02T10:11:46			
Read mode	TIMED	TIMED			

## 2.3 Aspect





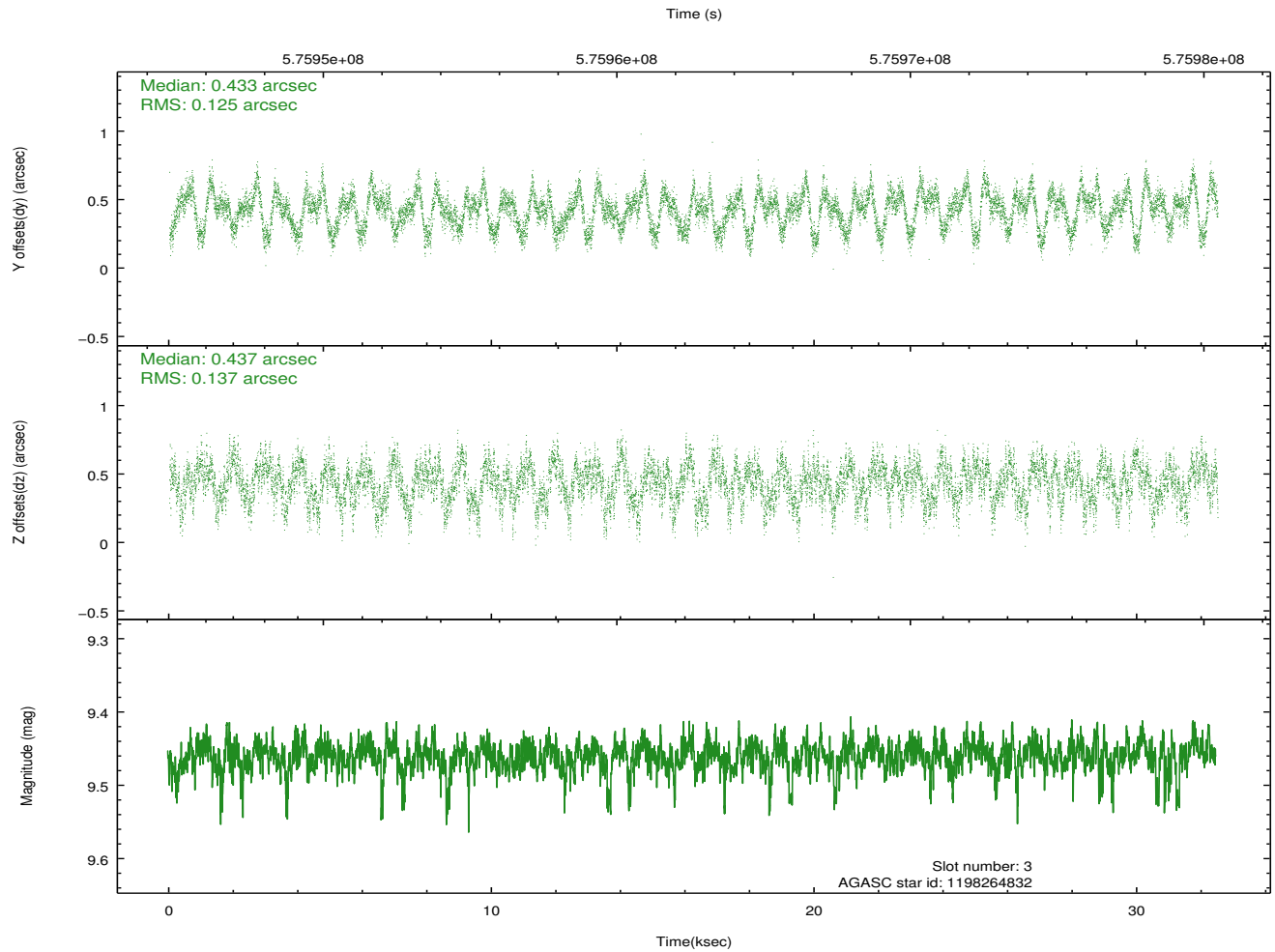
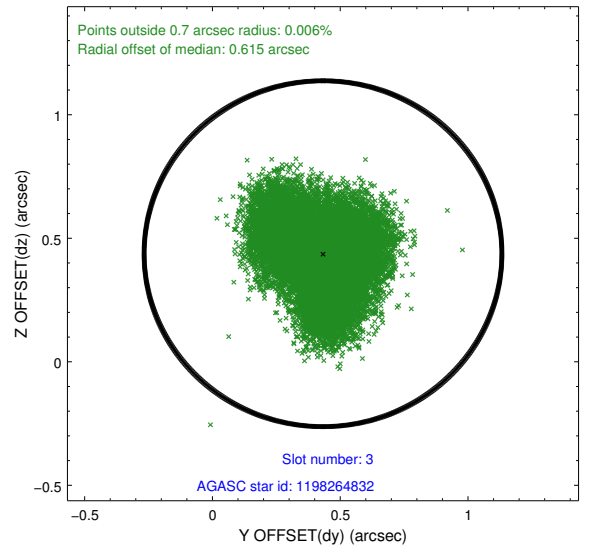
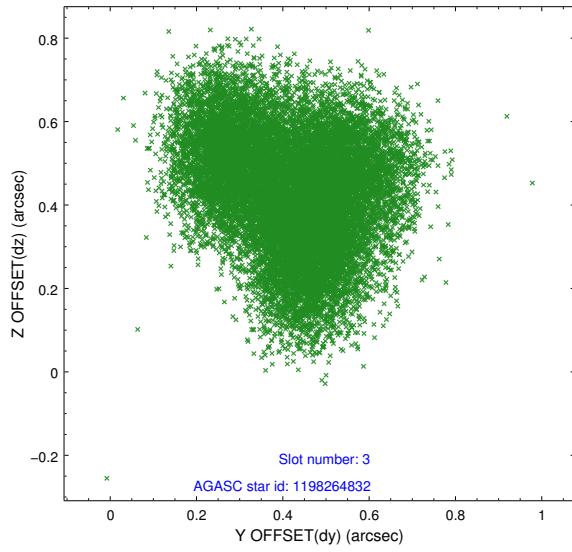
### Slot Statistics

slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	7.09	7925	-0.205	-0.131	0.016	0.048	0.000000	0.000000	-764.68	-1867.24
1	FID		ACIS-S-4	7.19	7925	0.391	0.133	0.009	0.016	0.000000	0.000000	2149.17	41.41
2	FID		ACIS-S-5	7.23	7923	-0.218	0.004	0.015	0.052	0.000000	0.000000	-1817.46	35.04
3	GUIDE	used	1198264832	9.46	15830	0.433	0.437	0.203	0.306	20.353668	-72.974637	-1058.82	-1635.51
4	GUIDE	used	1198269920	8.23	15846	0.177	0.272	0.087	0.140	20.316466	-73.033728	-1015.84	-1423.39
5	GUIDE	used	1198272400	9.14	15839	-0.039	-0.039	0.133	0.239	20.411923	-73.620598	-1075.68	690.61
6	GUIDE	used	1198273408	9.29	15831	-0.180	-0.330	0.135	0.214	17.532323	-73.621495	1846.81	708.34
7	GUIDE	used	1198282824	7.28	15849	-0.365	-0.336	0.100	0.163	18.044095	-73.907062	1305.01	1722.85

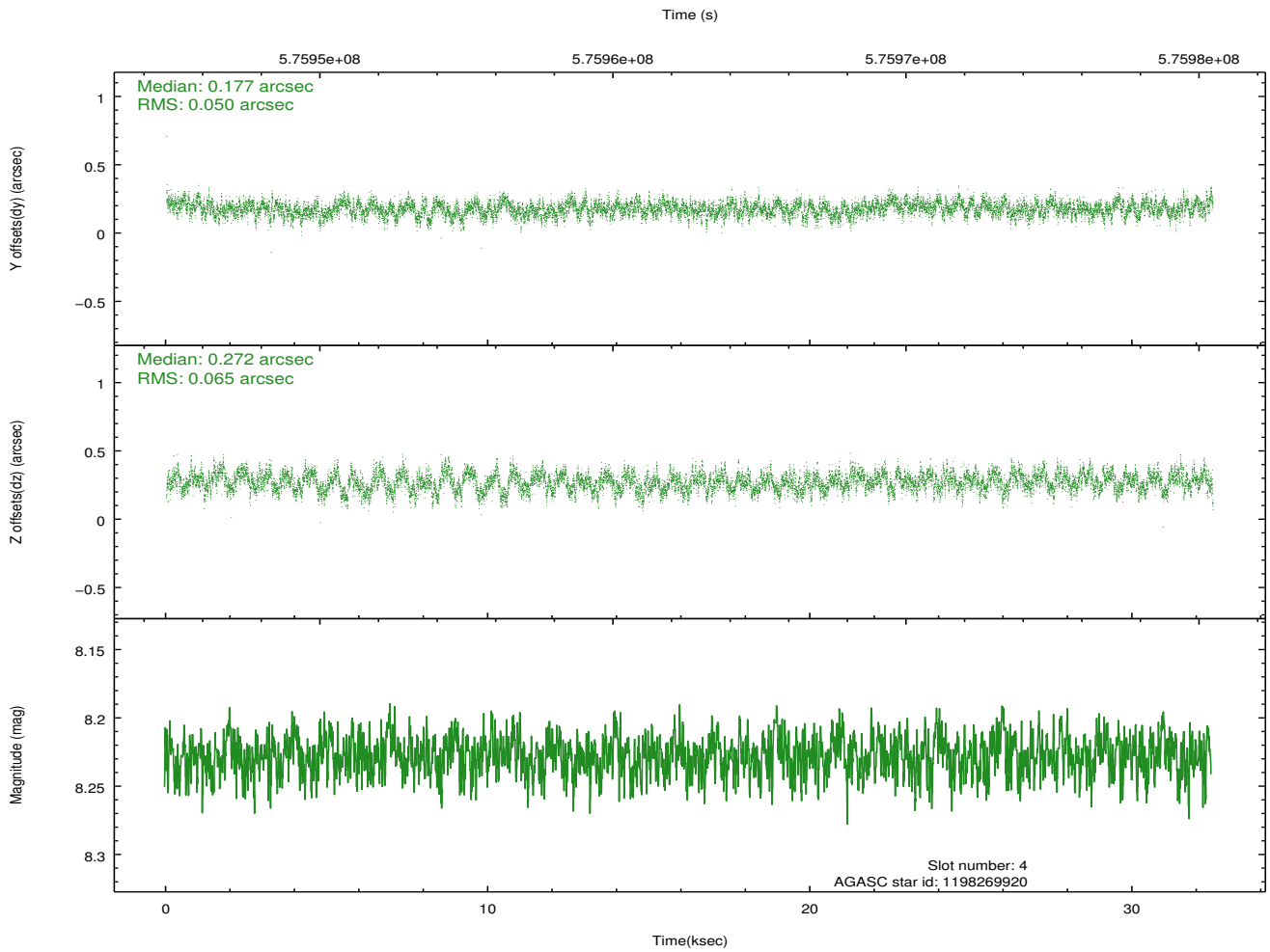
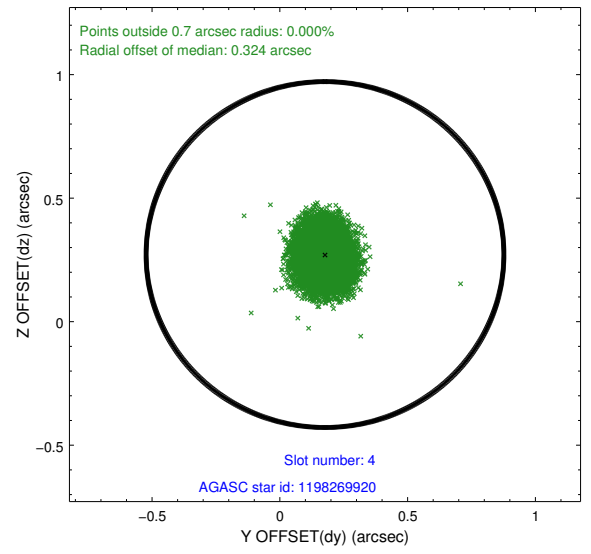
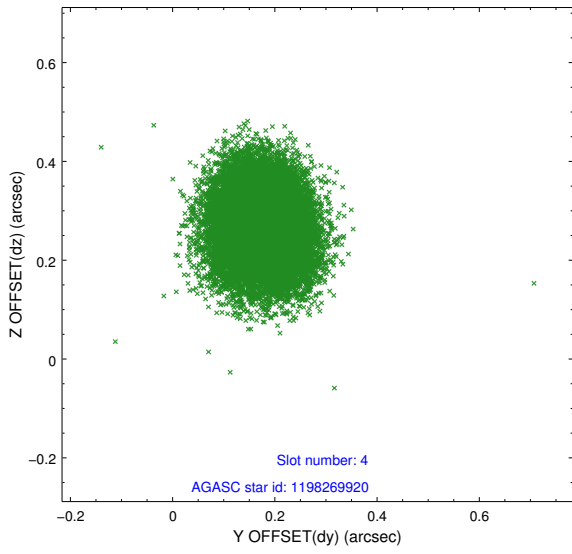
∞

## 2.4 Star Slots

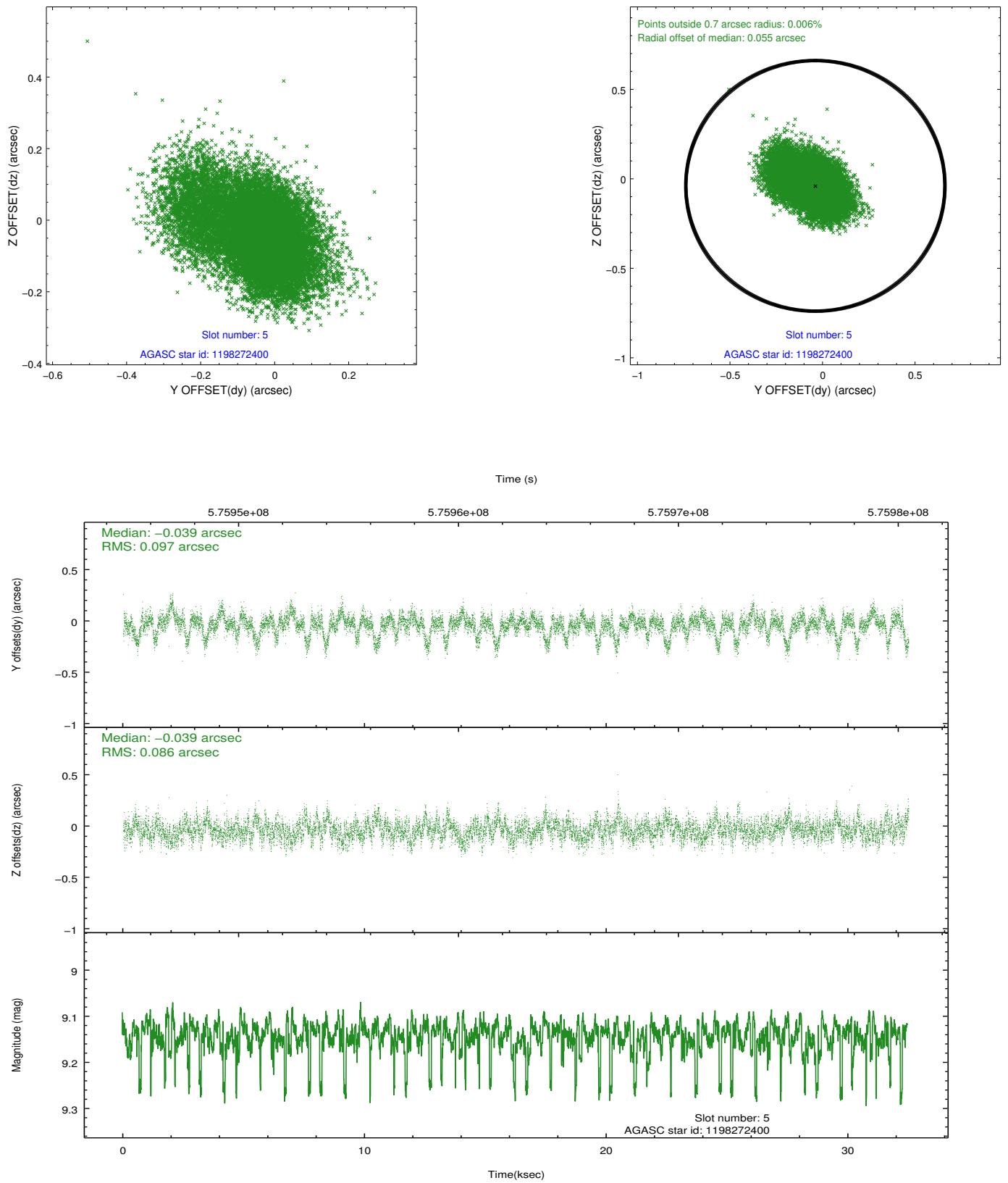
### 2.4.1 Slot 3



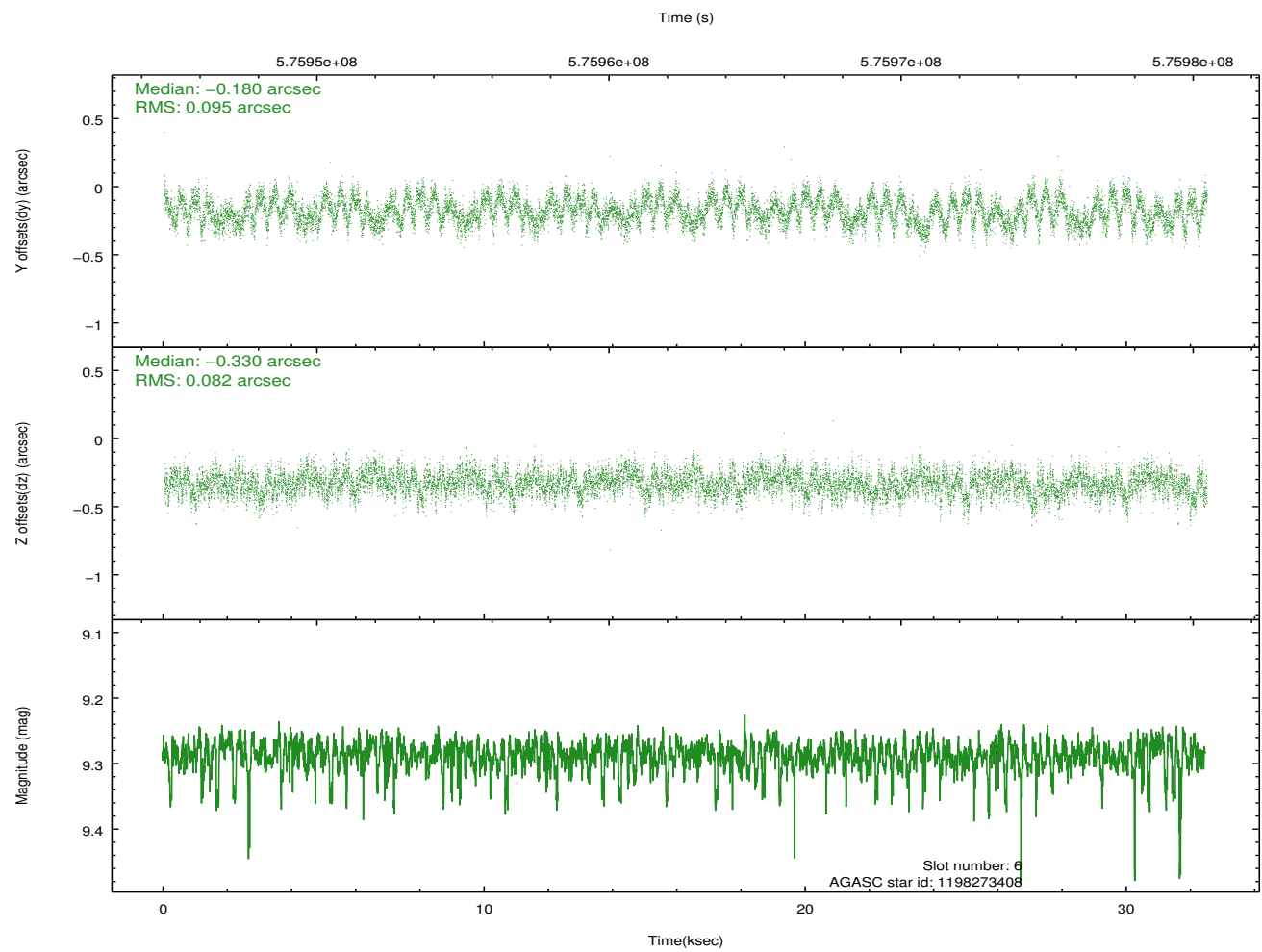
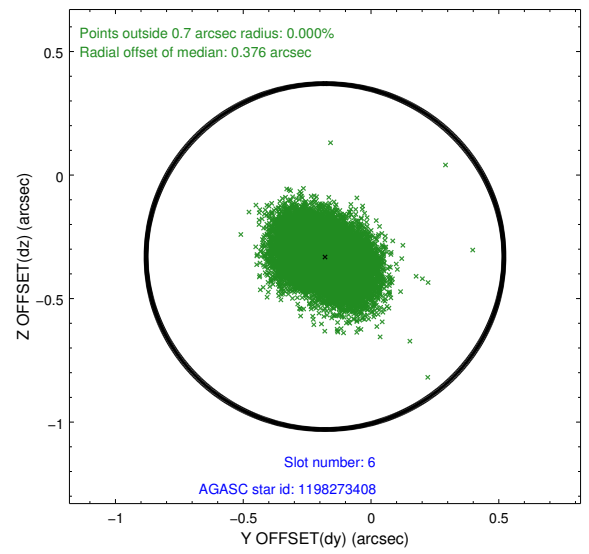
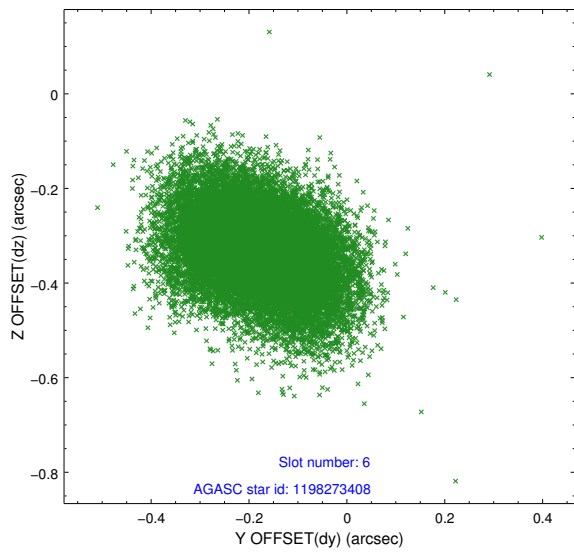
## 2.4.2 Slot 4



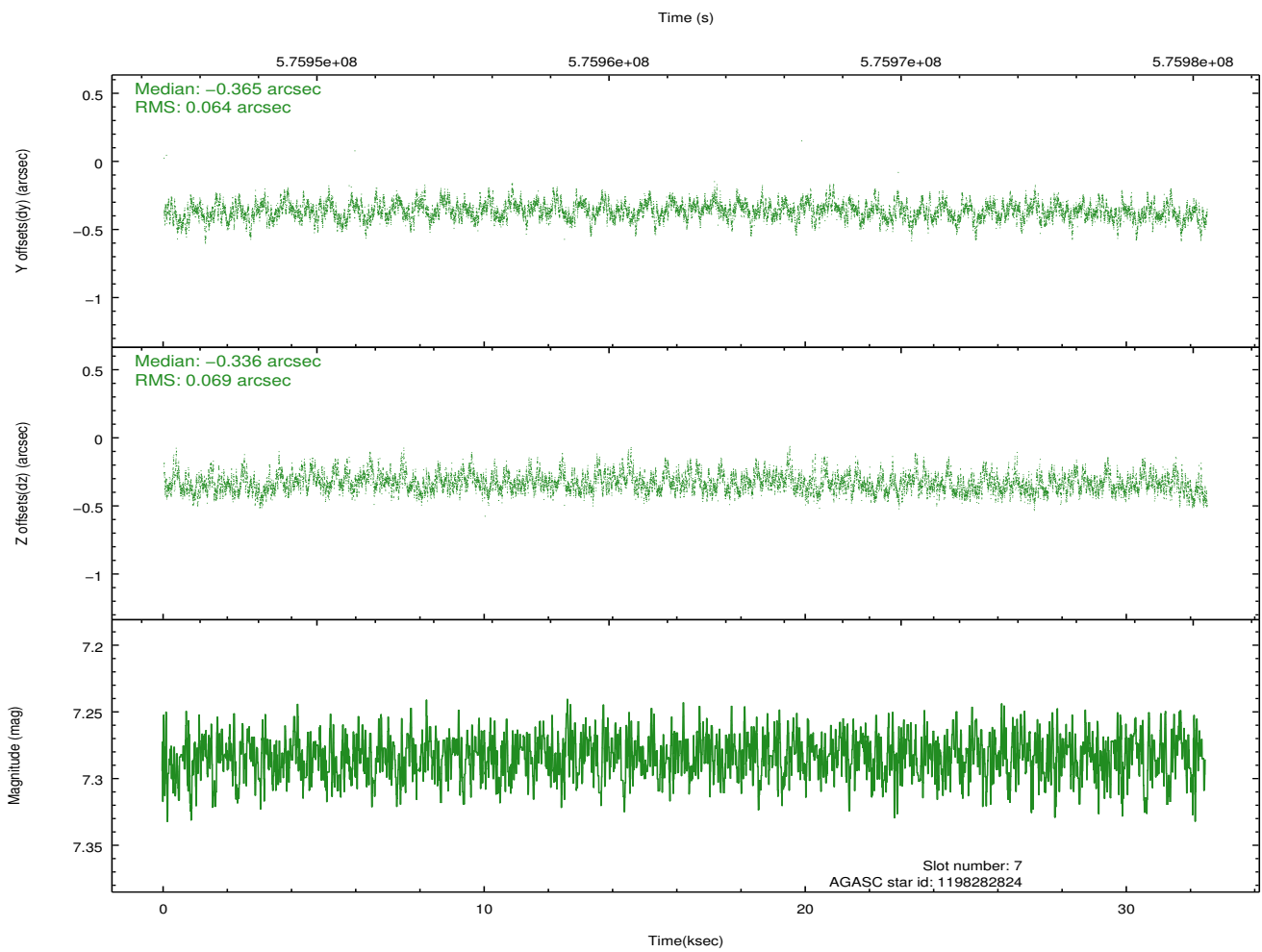
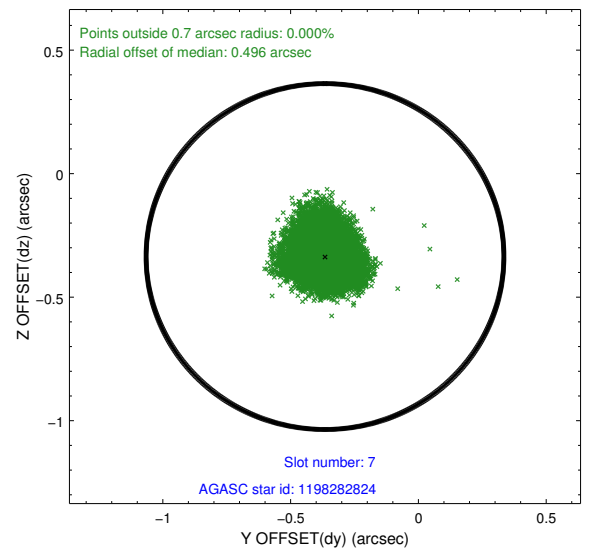
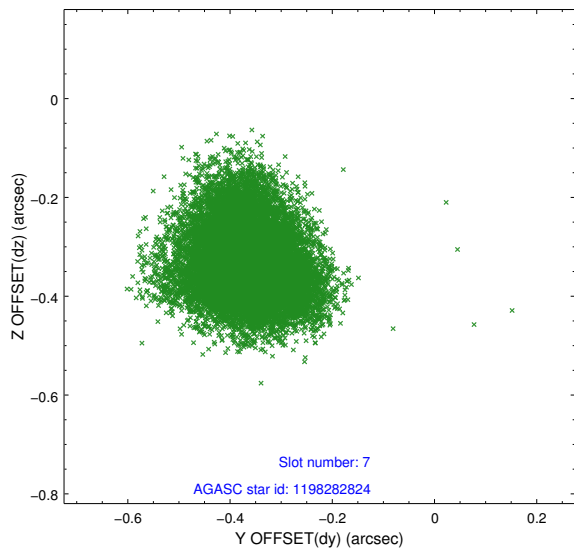
### 2.4.3 Slot 5



## 2.4.4 Slot 6

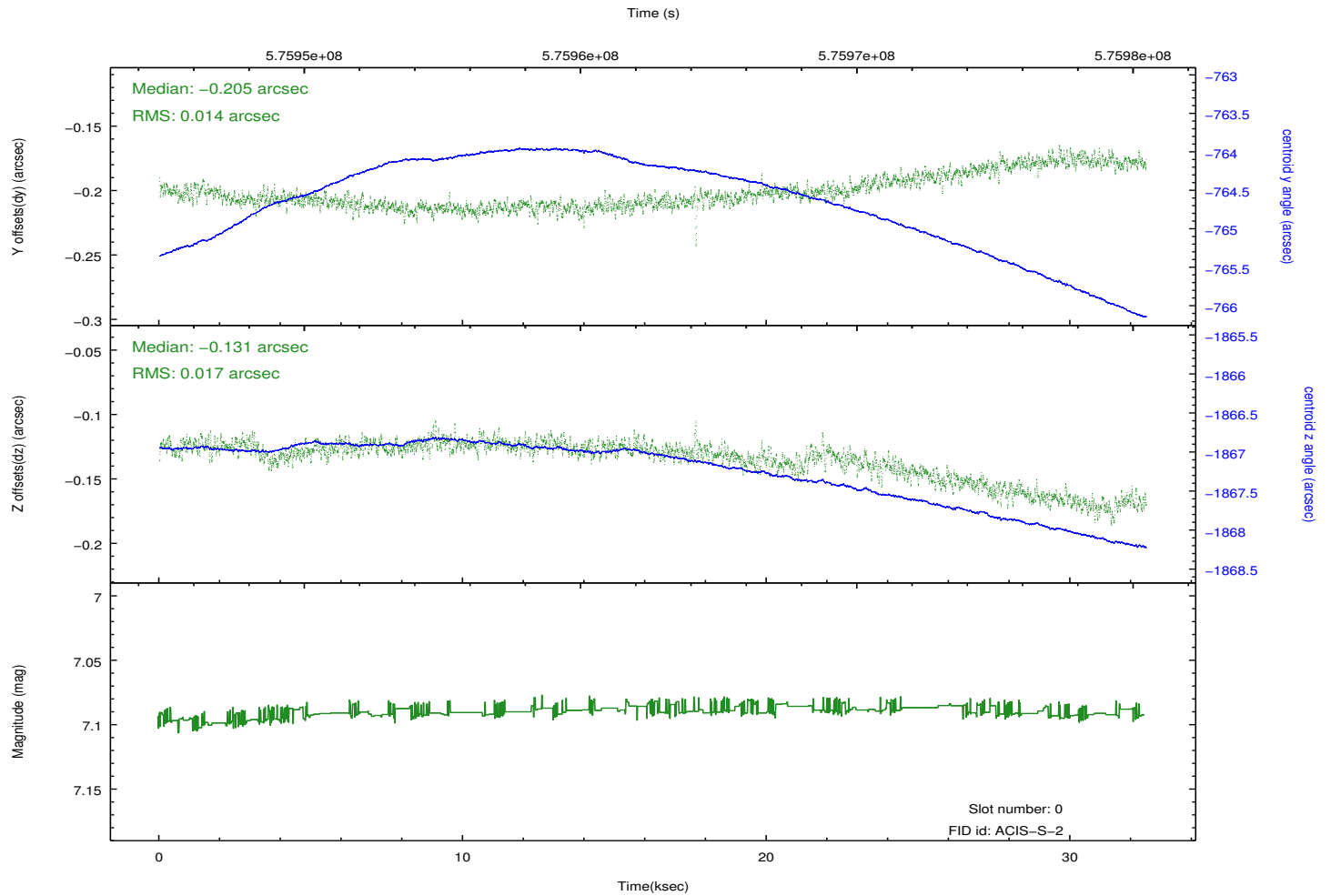
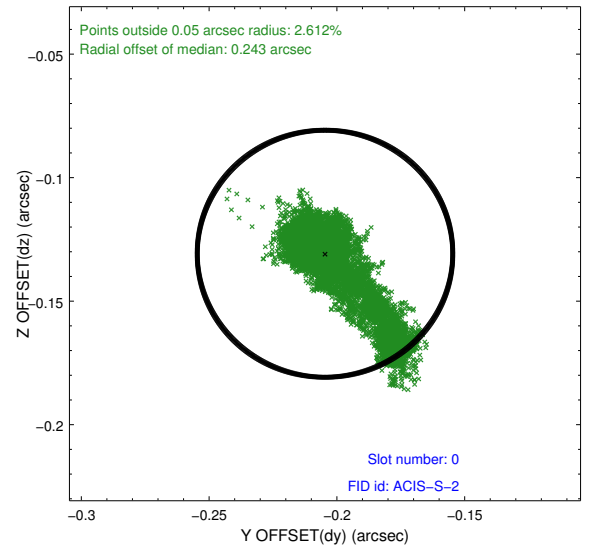
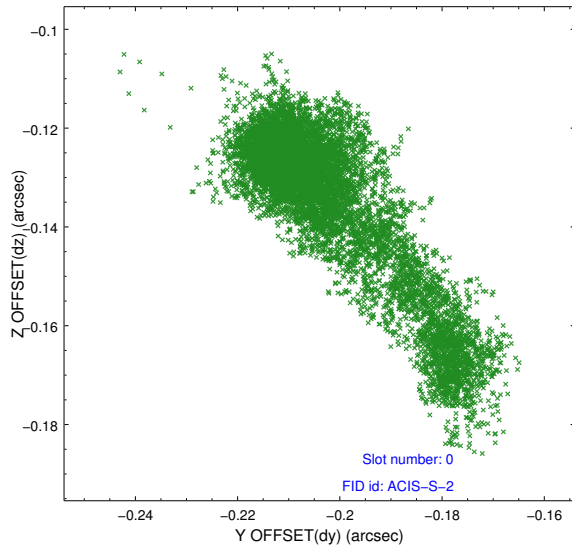


## 2.4.5 Slot 7

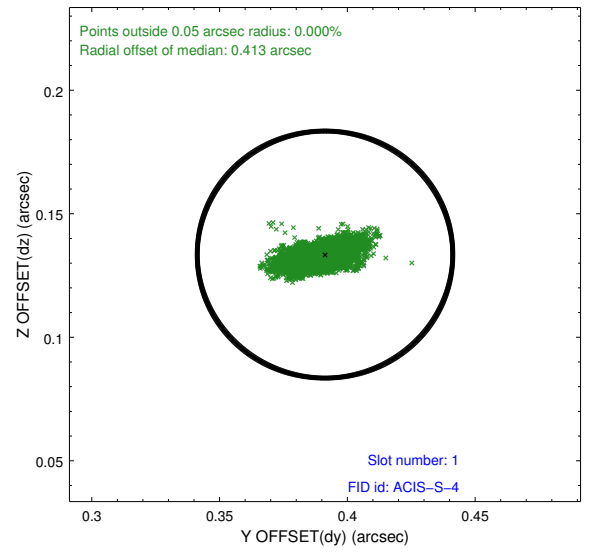
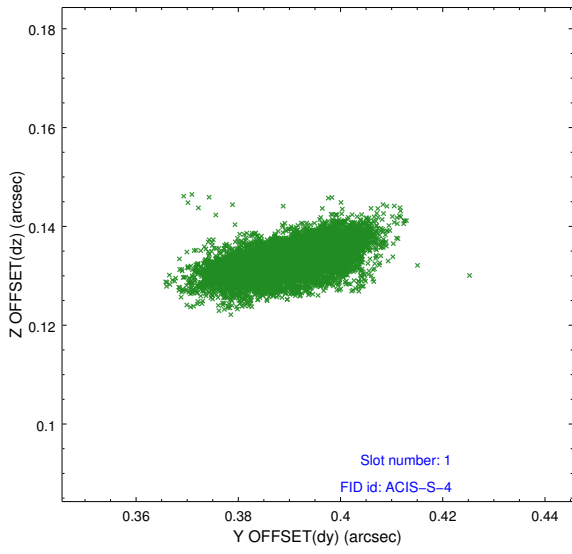


## 2.5 FID Slots

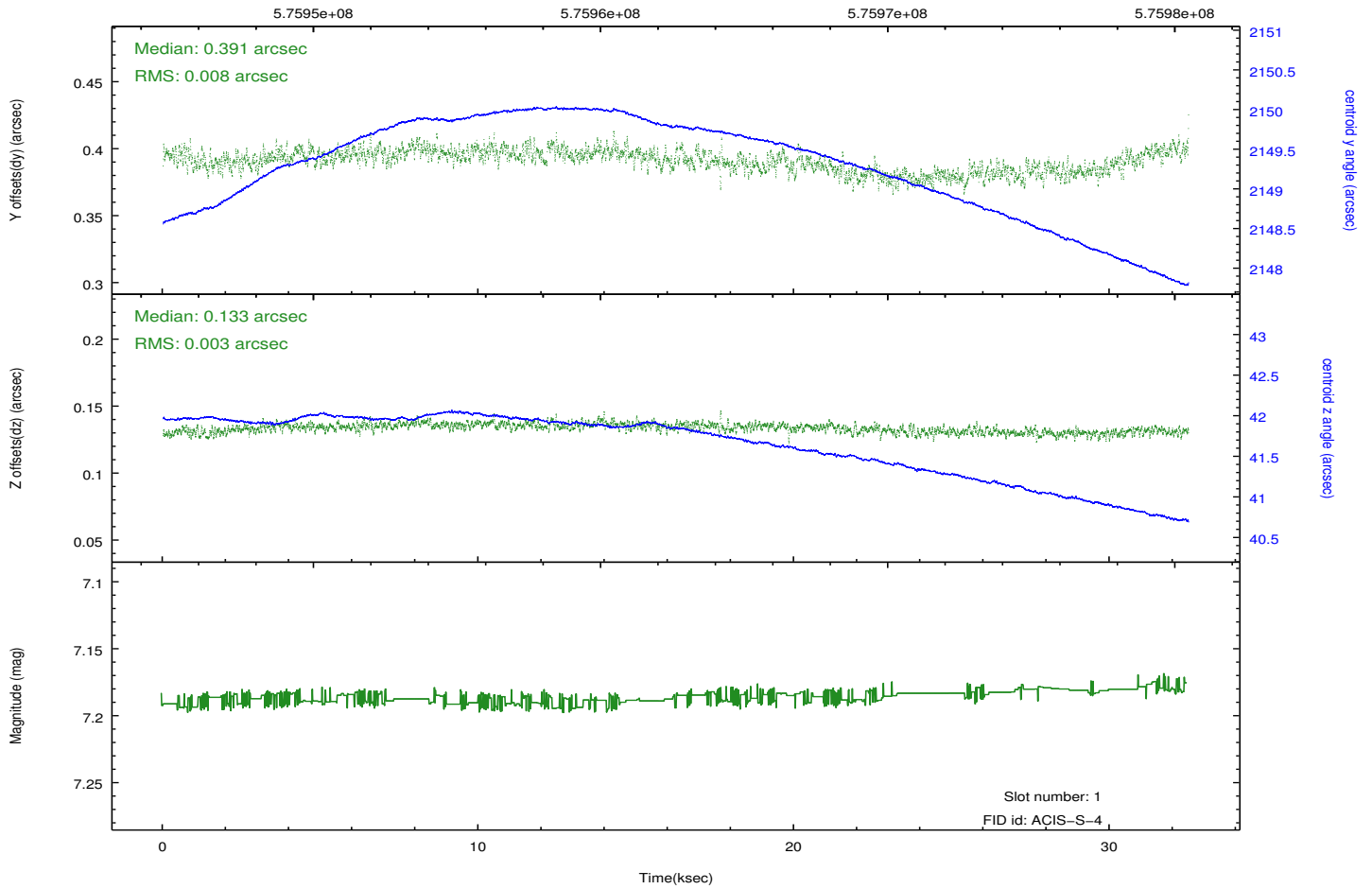
### 2.5.1 Slot 0



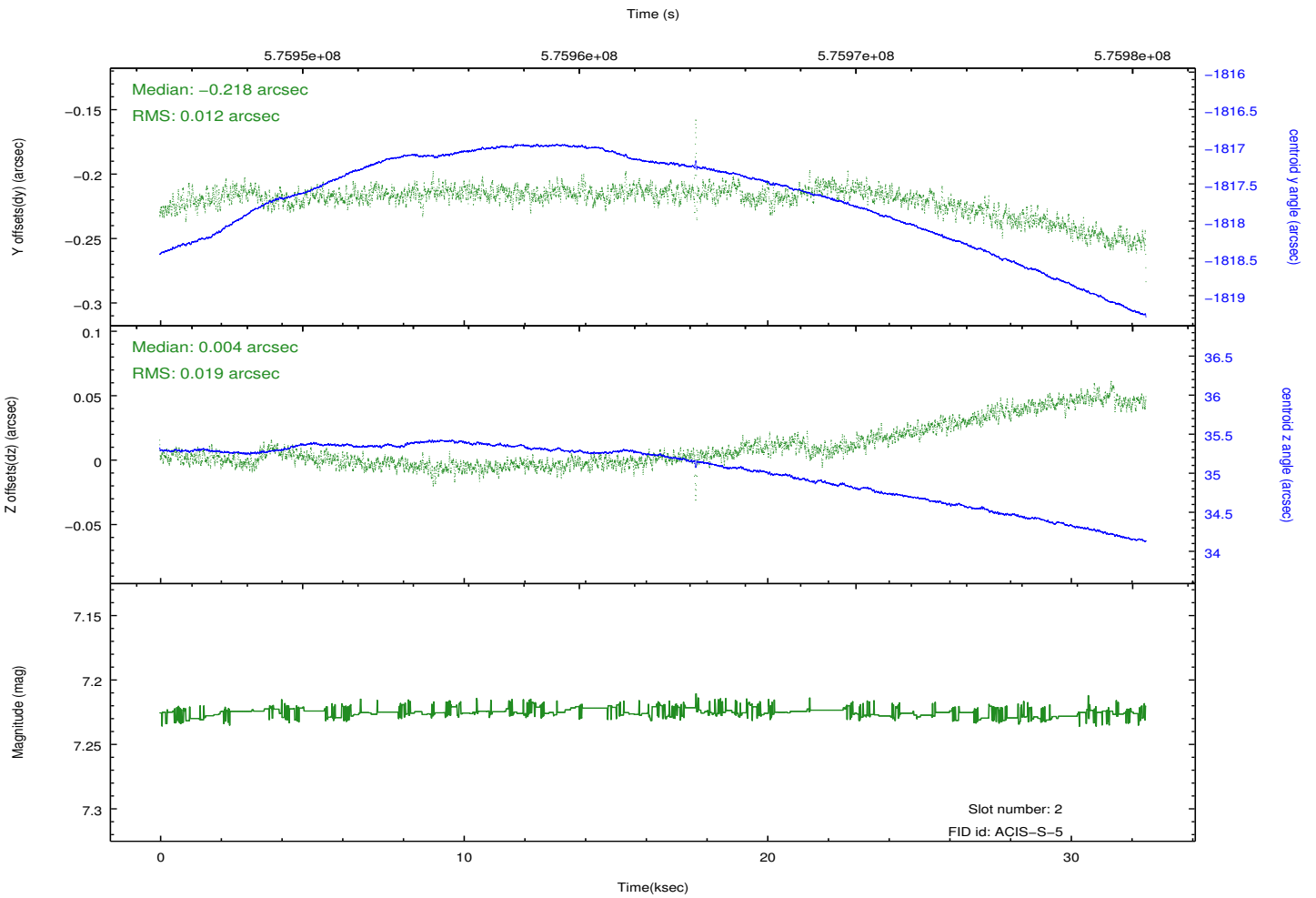
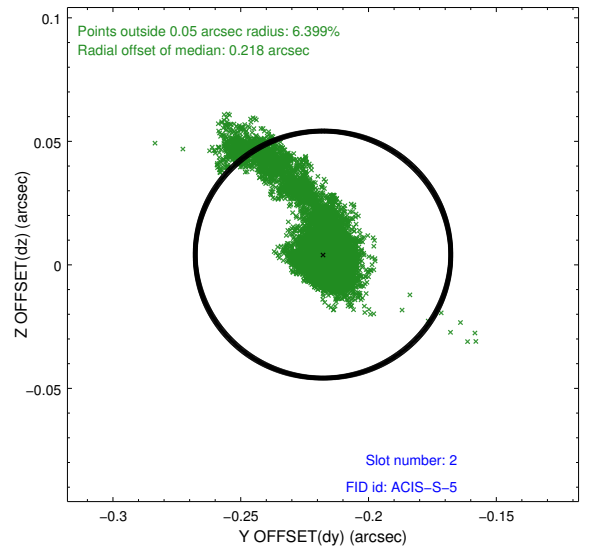
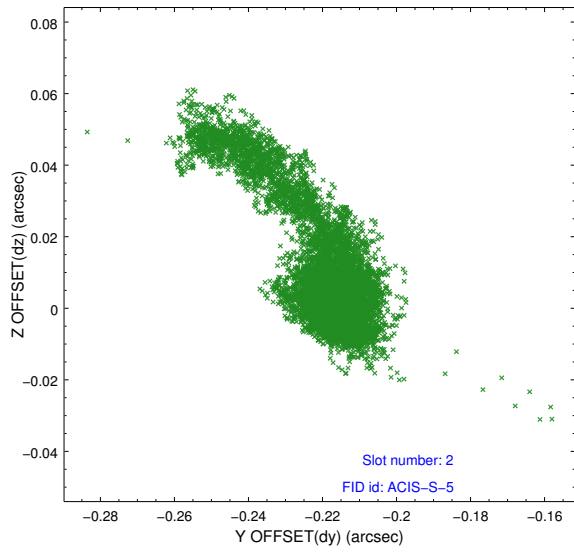
## 2.5.2 Slot 1



Time (s)

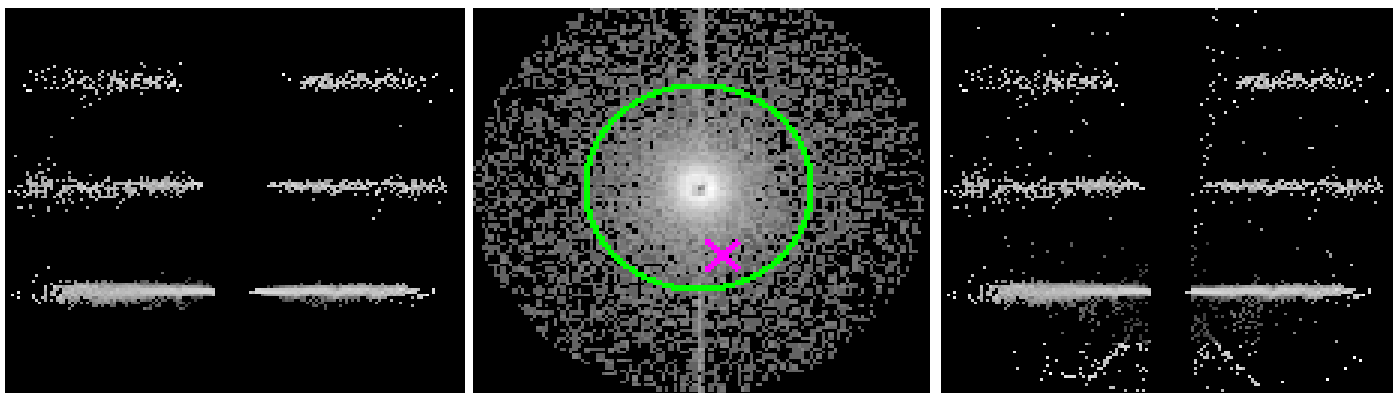


### 2.5.3 Slot 2



### 3 Gratings

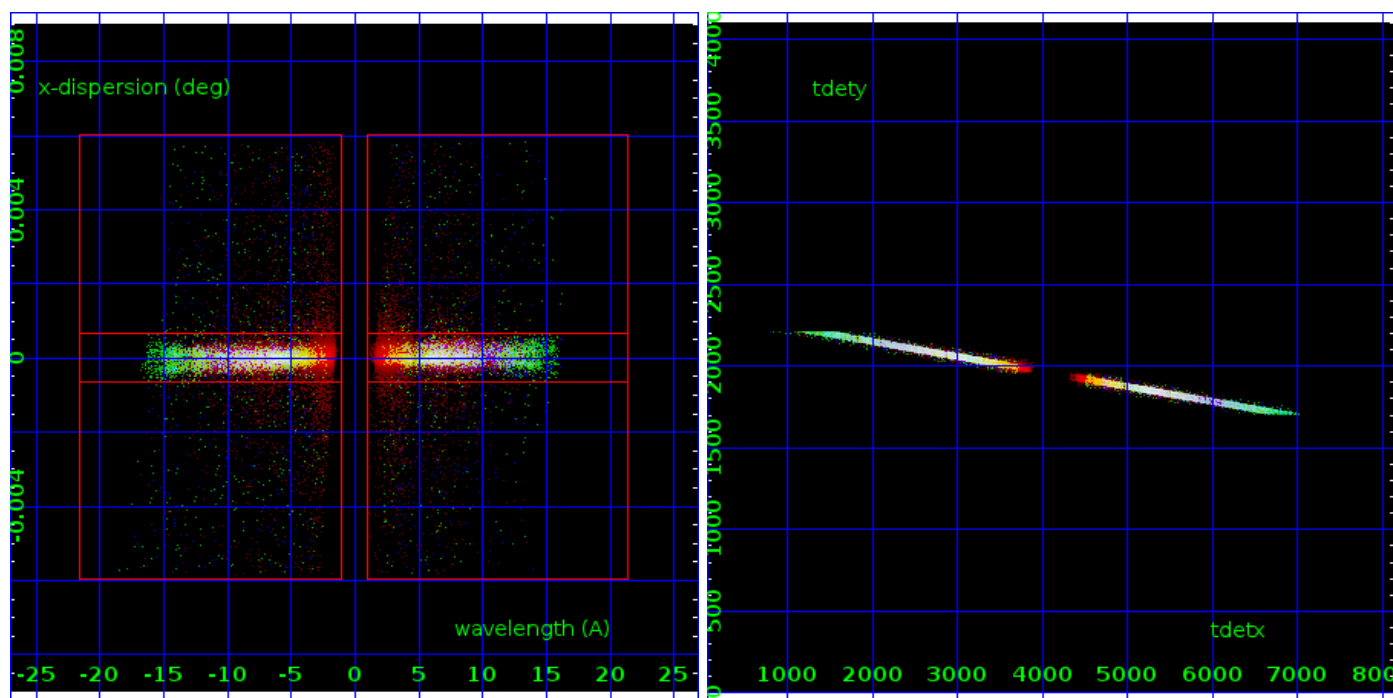
#### 3.1 HEG Arm



HEG Order Sort 123

HEG Zero Order

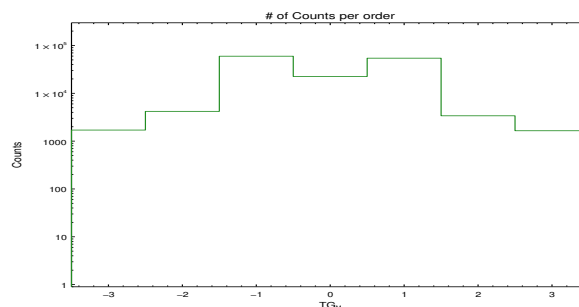
HEG Order Sort ALL



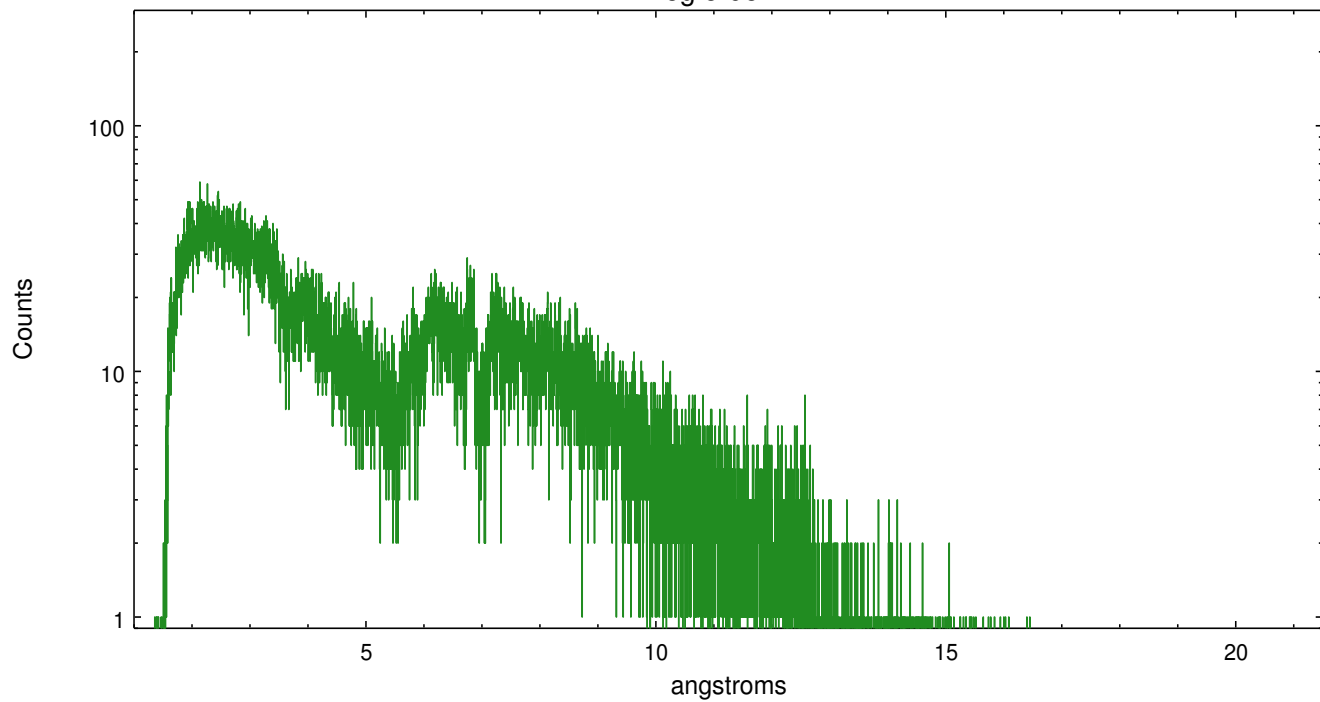
Spot Image HEG

Full Detector HEG

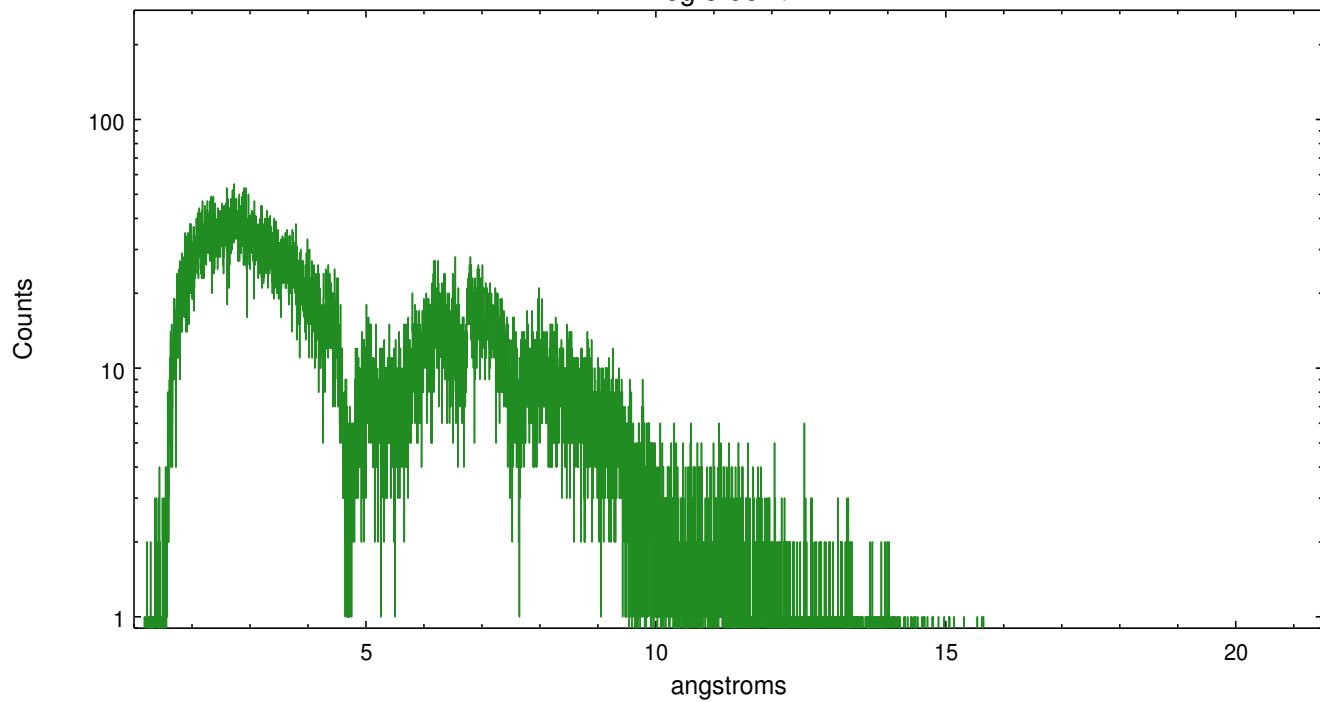
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	1704	4193	59689	22495	54274	3389	1650



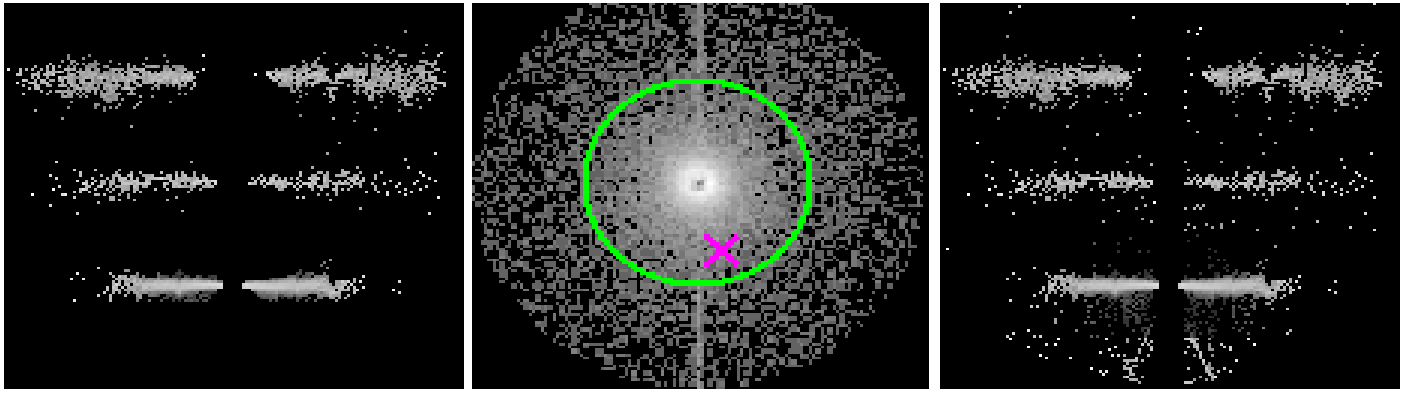
heg order -1



heg order +1



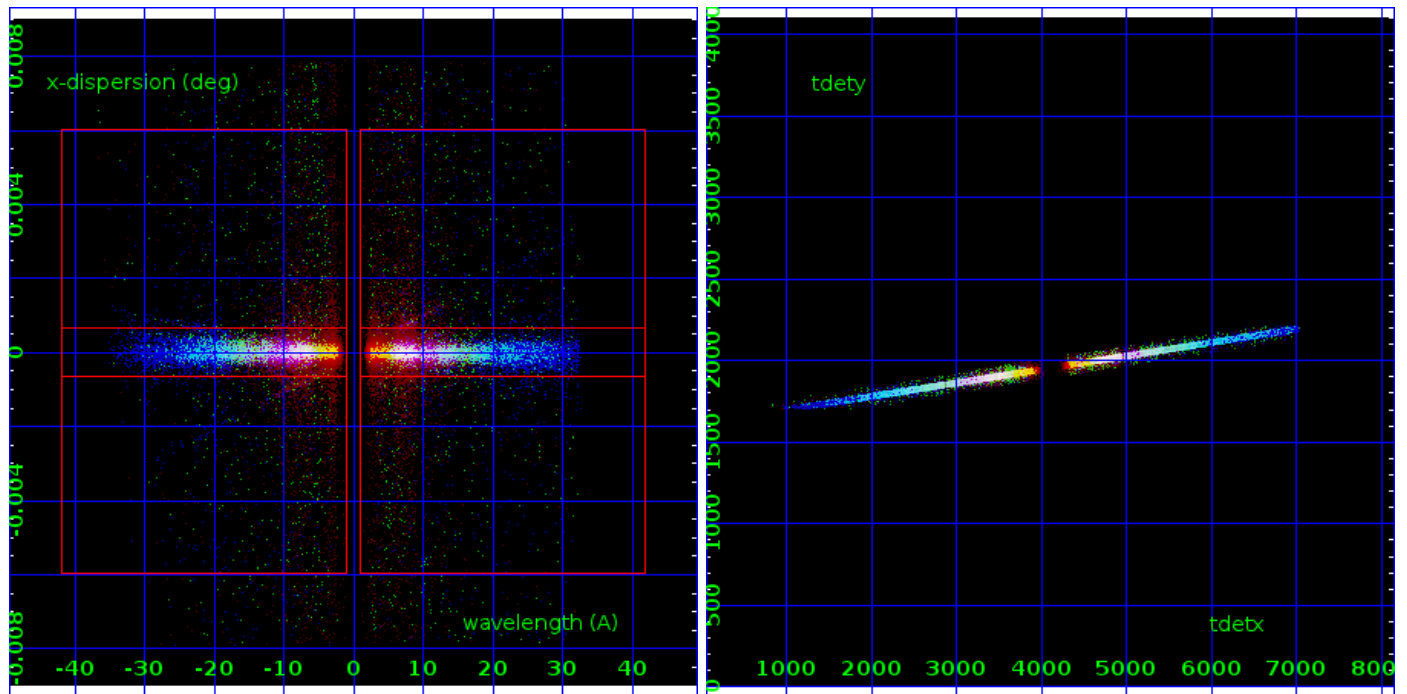
### 3.2 MEG Arm



MEG Order Sort 123

MEG Zero Order

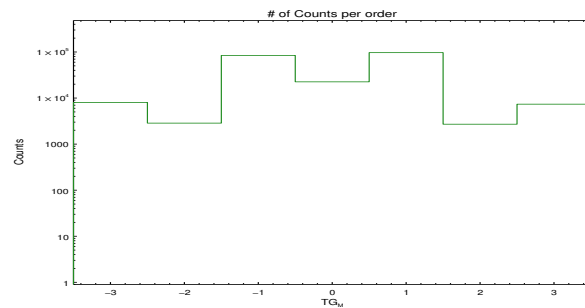
MEG Order Sort ALL



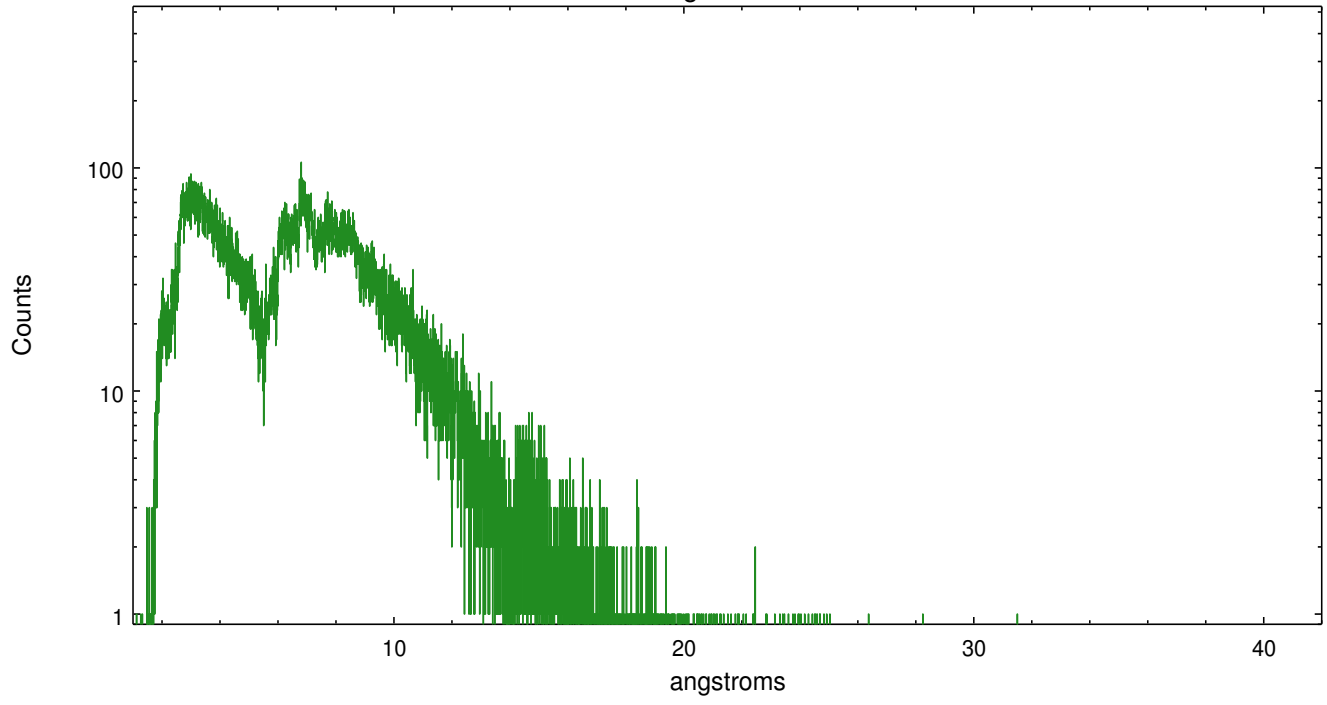
Spot Image MEG

Full Detector MEG

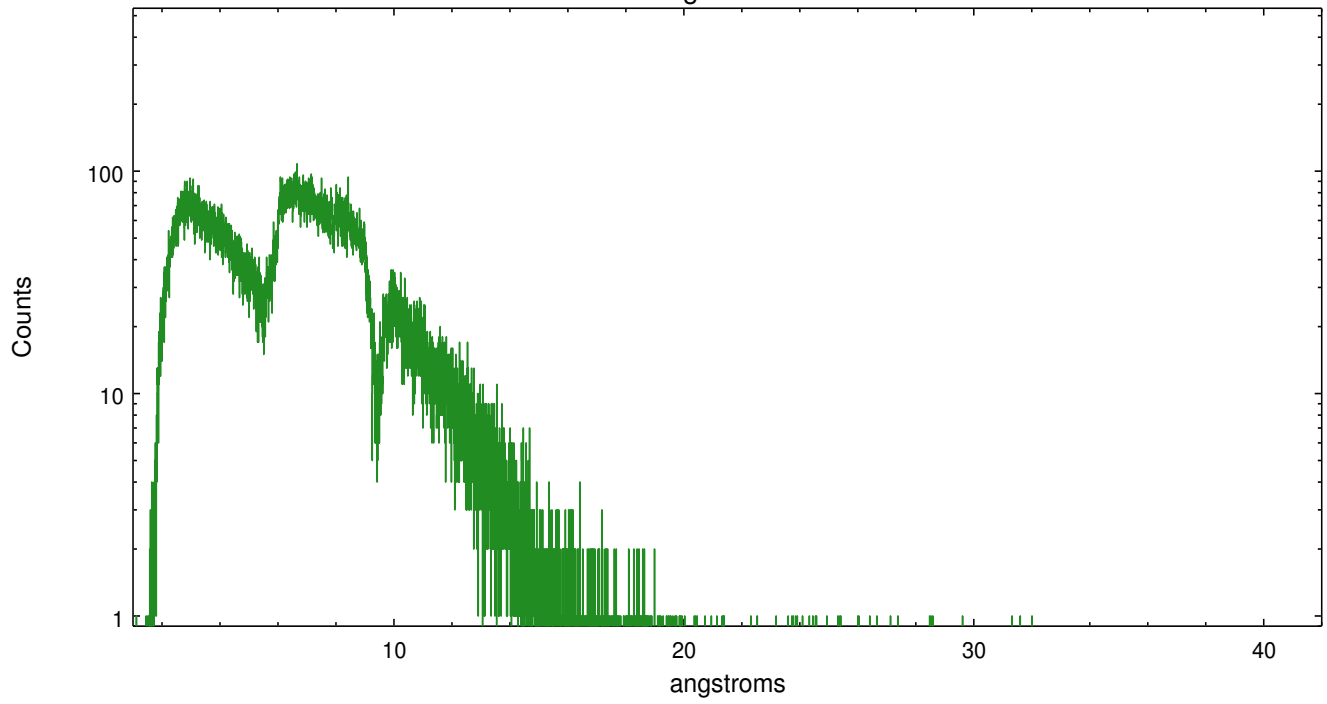
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	8042	2855	84276	22495	96870	2704	7362



meg order -1



meg order +1



# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2016.04.04
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	32.35950090766

## A.2 Comments

Phase constraint met.== 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 or leg dispersed spectral arm, rather than using a centroid position of the source. The findzero results are more accurate than source centroid in this case. === Faint grating spectra can be seen in an image of bad events. This is probably due to pileup in the spectrum, causing migration to bad grades. This should be considered in analysis.