

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 1016 - L2 Version 5  
Chandra X-Ray Center

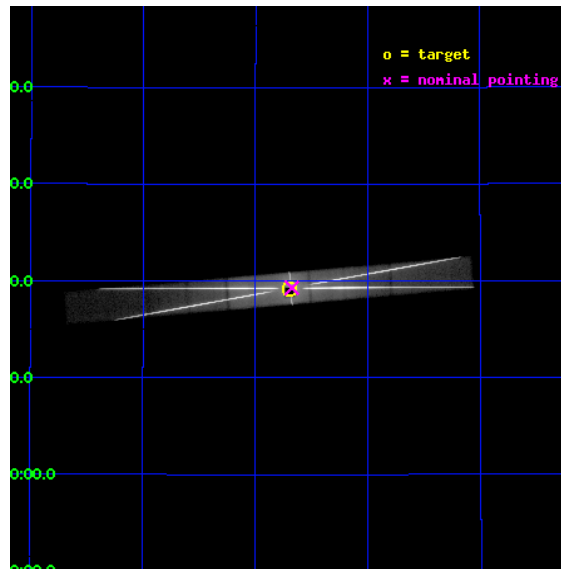
L2 Processing Date : Oct 12 2012

## 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	Parameters . . . . .	4
2.1.3	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	400094	Sequence number
obs_id	1016	Observation id
title	PHOTOIONIZED X-RAY EMISSION IN CYG X-2	Proposal title
observer	Prof Claude Canizares	Principal investigator
object	CYG X-2	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	326.17375	Observer's specified target RA [deg]
dec_targ	38.319611	Observer's specified target Dec [deg]
ra_nom	326.16876672372	Nominal RA [deg]
dec_nom	38.321698449974	Nominal Dec [deg]
roll_nom	174.99446463021	Nominal Roll [deg]
revision	5	Processing version of data
ontime	15126.799965337	Sum of GTIs [s]
livetime	14663.872781526	Livetime [s]
ontime5	15126.799965337	Sum of GTIs [s]
ontime6	15126.799965337	Sum of GTIs [s]
ontime7	15126.799965337	Sum of GTIs [s]
ontime8	15125.458925322	Sum of GTIs [s]
ontime9	15126.799965337	Sum of GTIs [s]
l2events	4107845	Number of level 2 events

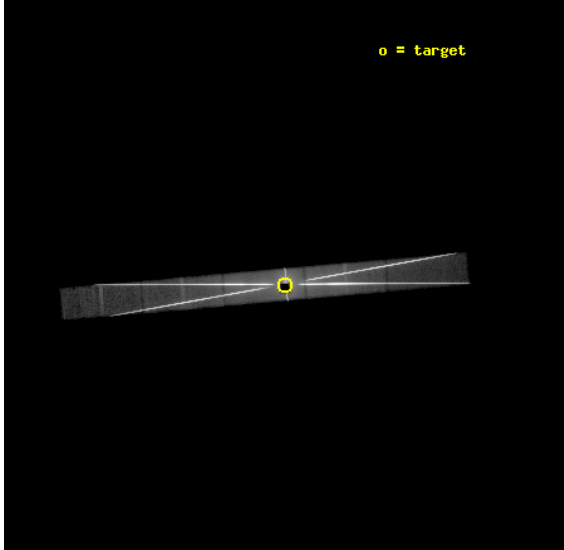


## 2 OBI

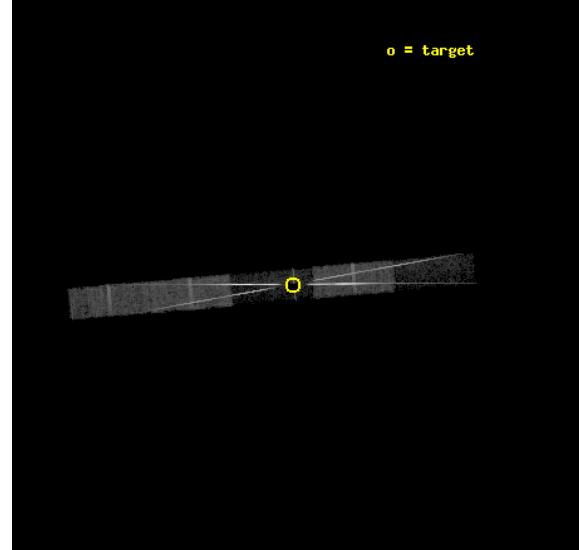
### 2.1 OBI

#### 2.1.1 Images

Level 1 Image



Level 1 Bad Events



### 2.1.2 Parameters

obi_num	0	Obi number	sched_exp_time	14570.132000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	15126.799965337	Sum of GTIs [s]
caldbver	4.5.1.1	&#160	ontime5	15126.799965337	Sum of GTIs [s]
date	2012-09-22T10:17:02	Date and time of file creation	ontime6	15126.799965337	Sum of GTIs [s]
revision	4	Processing version of data	ontime7	15126.799965337	Sum of GTIs [s]
			ontime8	15125.458925322	Sum of GTIs [s]
			ontime9	15126.799965337	Sum of GTIs [s]
			l1events	4788727	Number of level 1 events

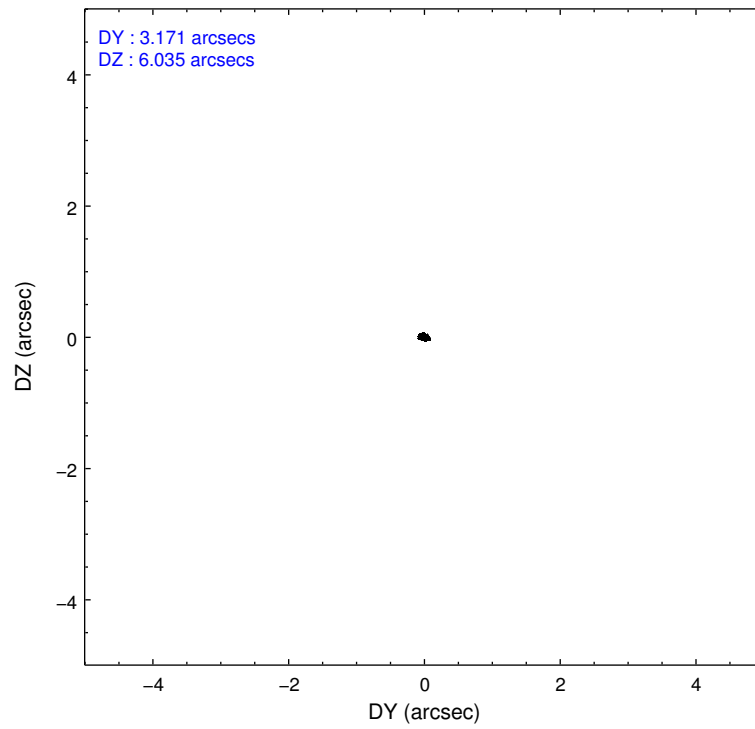
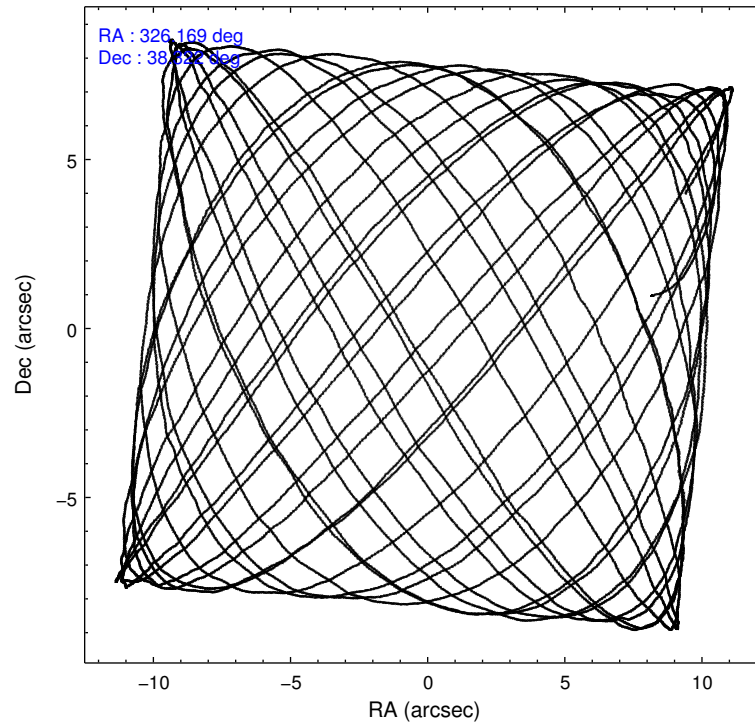
### 2.1.3 Events

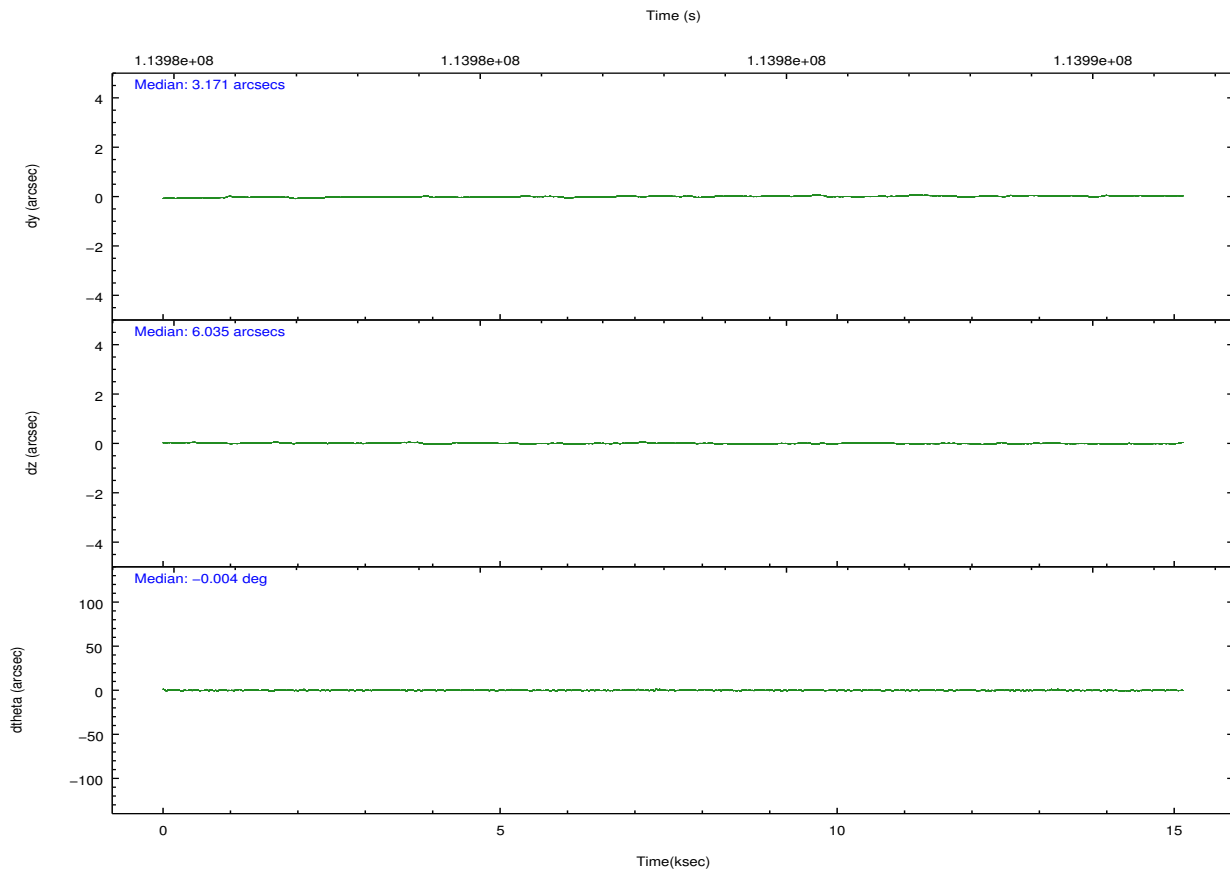
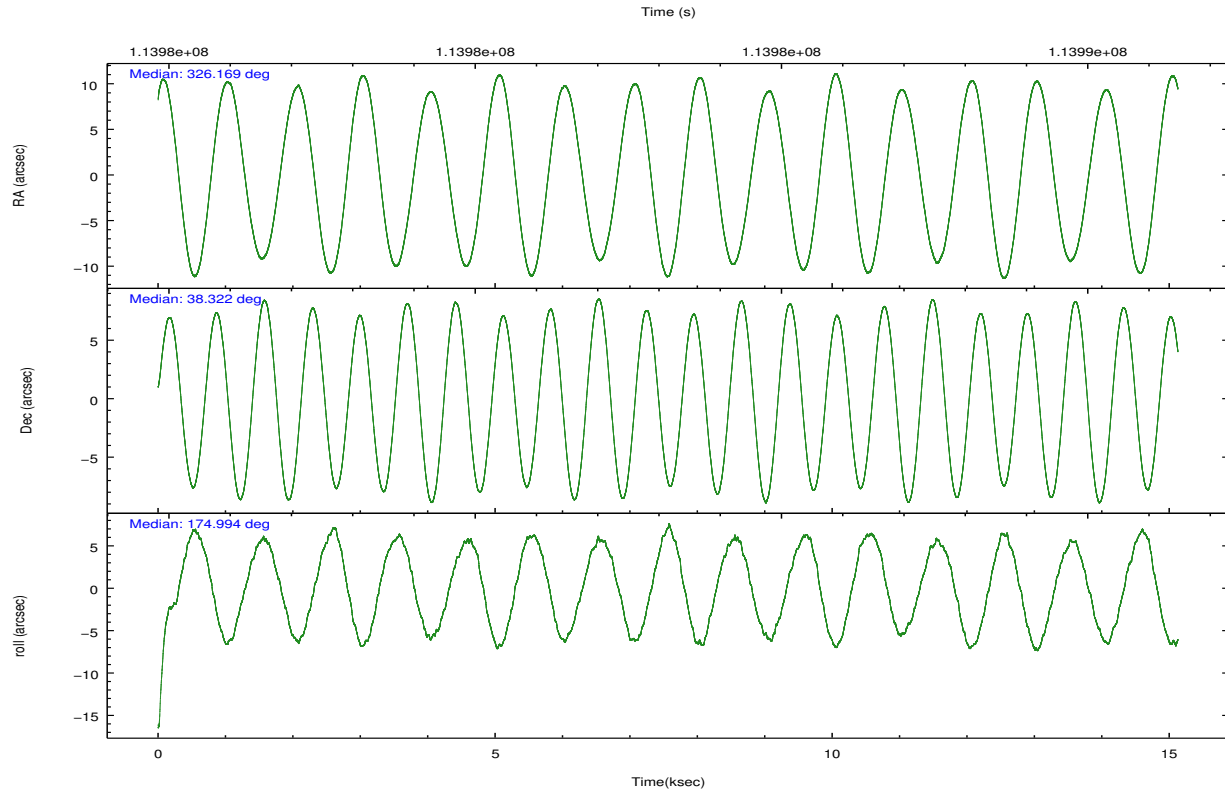
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	416716	1816630	1575697	877799	101885	grade 0 events	124199	1193546	234111	645451	57070
rejected events	21572	164892	208968	66195	29054		29%	65%	14%	73%	56%
rejected %	5%	9%	13%	7%	28%	grade 1 events	1575	67711	16264	17192	283
							0%	3%	1%	1%	0%
						grade 2 events	130382	220147	346860	88344	8379
							31%	12%	22%	10%	8%
						grade 3 events	34708	84767	138565	29639	2748
							8%	4%	8%	3%	2%
						grade 4 events	34640	81750	138428	29717	2701
							8%	4%	8%	3%	2%
						grade 5 events	7637	44635	73044	8786	563
							1%	2%	4%	1%	0%
						grade 6 events	71603	73014	510023	19183	1981
							17%	4%	32%	2%	1%
						grade 7 events	11972	51060	118402	39487	28160
							2%	2%	7%	4%	27%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-56789	ACIS-56789	Obspar file type	PREDICTED	ACTUAL
Grating	HETG	HETG	Obspar update status	NONE	UPDATED
Data mode	GRADED	GRADED	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	326.200097	326.1687667237229	Subarray requested	CUSTOM	CUSTOM
[deg] Pointing Dec	38.333474	38.32169844997354	Subarray start row	1	1
[deg] Pointing Roll	174.818412	174.9944646302123	Subarray row count	380	380
[mm] SIM focus pos	-0.684267	-0.6828225247311905	Alternating exposures requested	N	N
[mm] SIM defocus	0	0.001444936568705701	[s] Primary exposure time	0.000000	1.3
[mm] SIM translation stage pos	-182.404523	-182.3984892363686			
[mm] SIM translation stage offset	-7.728	-7.734033346639166			
[s] Observation start time (MET)	113976143.184000	113974994.33701			
Observation start date	2001-08-12T04:01:19	2001-08-12T03:43:14			
[s] Observation end time (MET)	113990713.184000	113991028.41264			
Observation end date	2001-08-12T08:04:09	2001-08-12T08:10:28			
Read mode	TIMED	TIMED			

## 2.3 Aspect



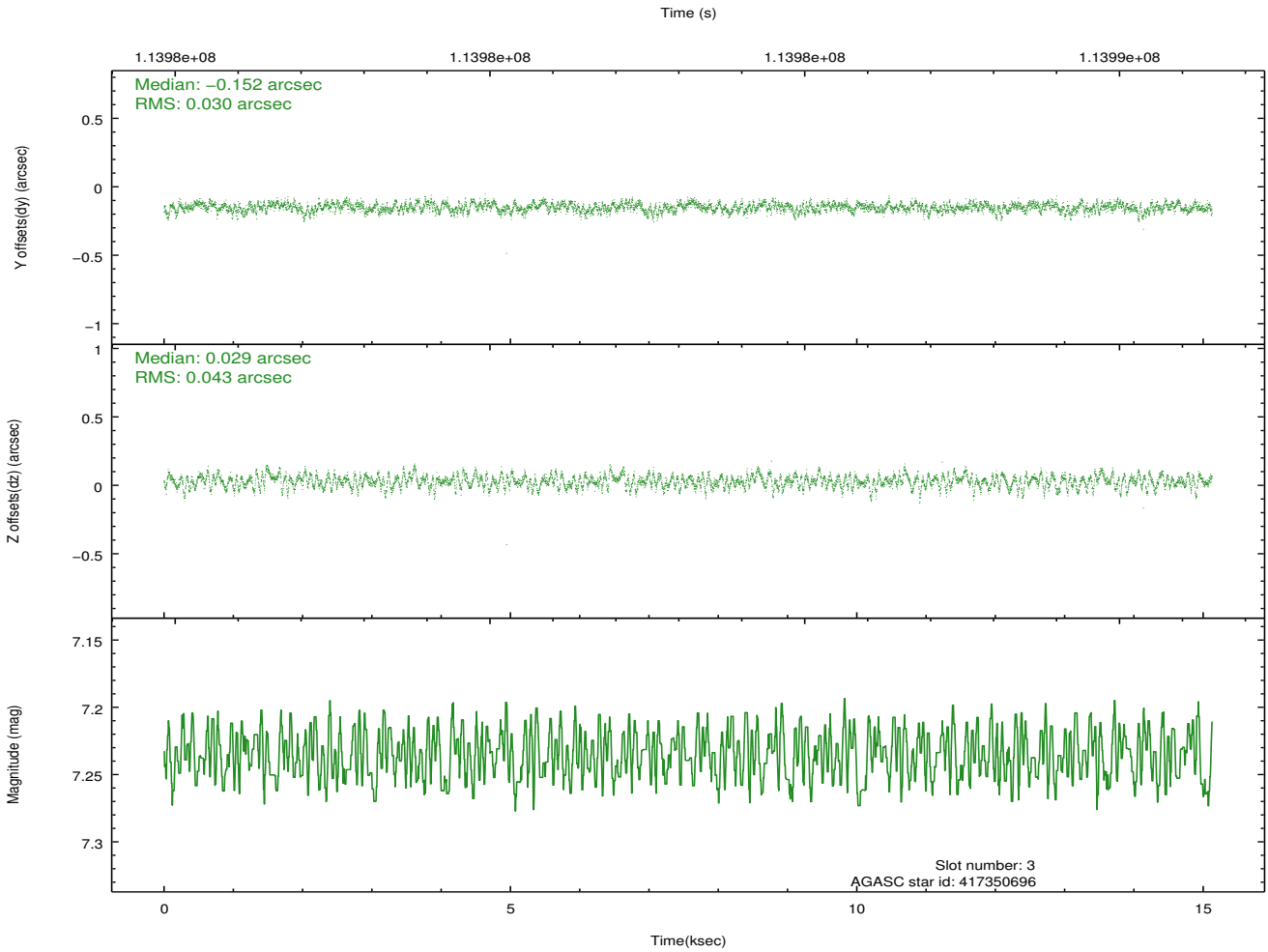
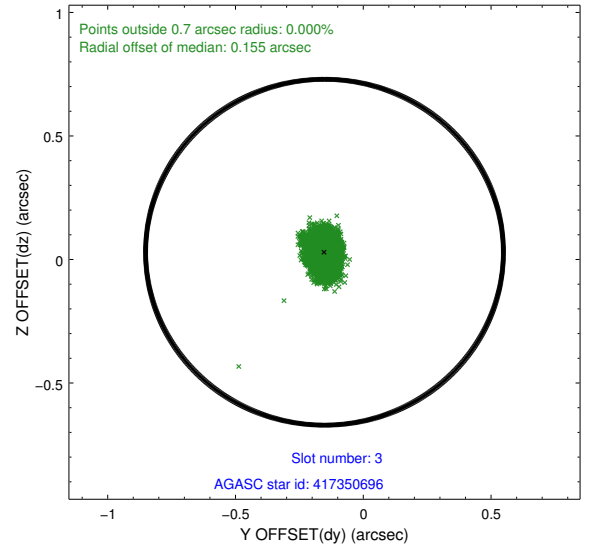
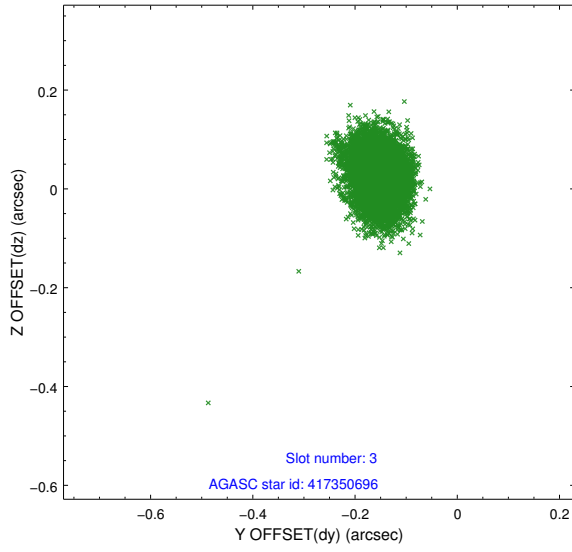


### Slot Statistics

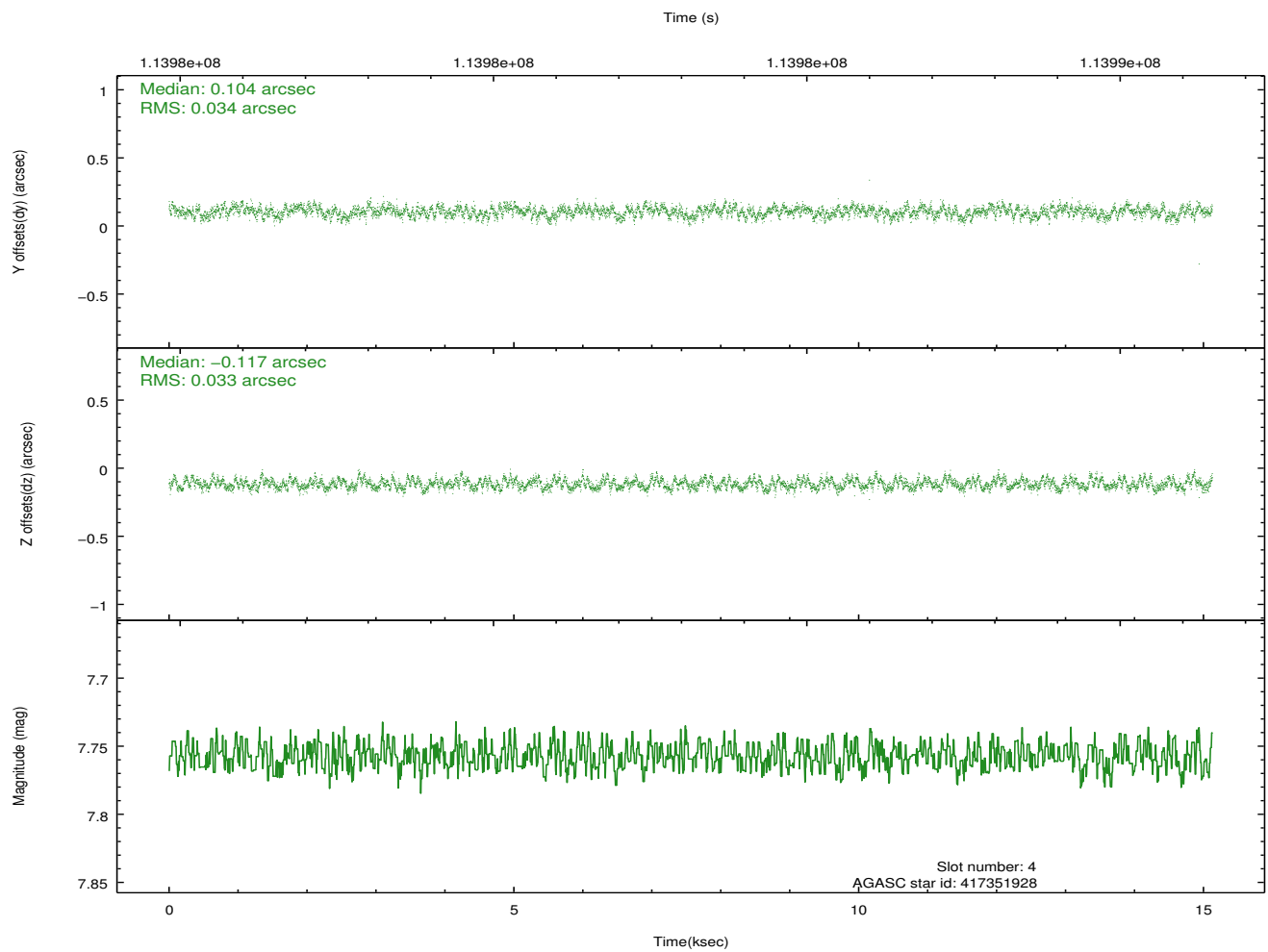
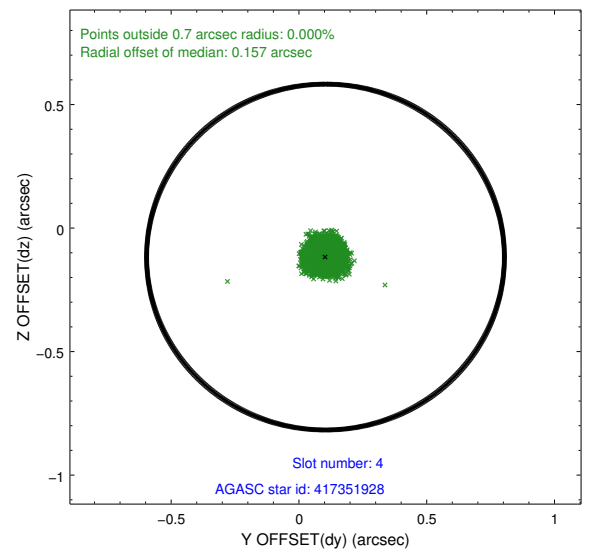
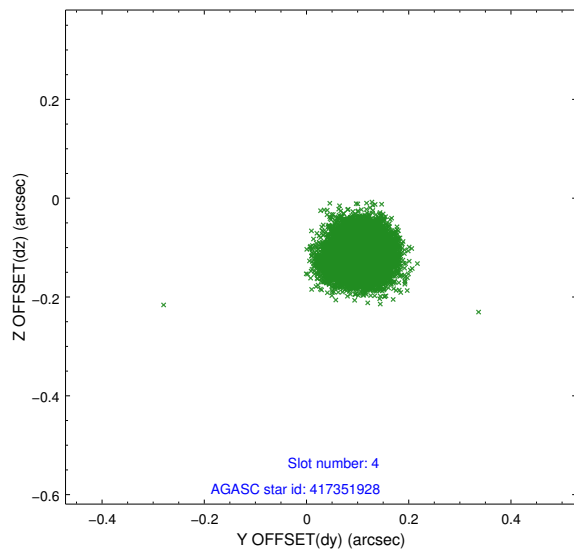
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.10	3690	-0.049	-0.059	0.006	0.010	0.000000	0.000000	-755.31	-1886.57
1	FID	ACIS-S-4	7.18	3690	0.012	0.039	0.005	0.010	0.000000	0.000000	2157.89	21.65
2	FID	ACIS-S-5	7.23	3690	0.006	0.028	0.006	0.011	0.000000	0.000000	-1807.71	15.65
3	GUIDE	417350696	7.24	7380	-0.152	0.029	0.055	0.091	327.076779	38.956124	-2241.63	-2465.48
4	GUIDE	417351928	7.76	7381	0.104	-0.117	0.052	0.079	326.969486	38.210974	-2207.30	233.48
5	GUIDE	417339000	7.78	7379	-0.045	0.013	0.060	0.099	325.733777	37.904925	1179.08	1653.11
6	GUIDE	417348376	8.21	7381	0.022	-0.058	0.056	0.090	325.737694	38.184491	1254.57	649.64
7	GUIDE	417341096	8.76	7380	0.070	0.140	0.054	0.089	325.689531	38.411650	1459.64	-153.63

## 2.4 Star Slots

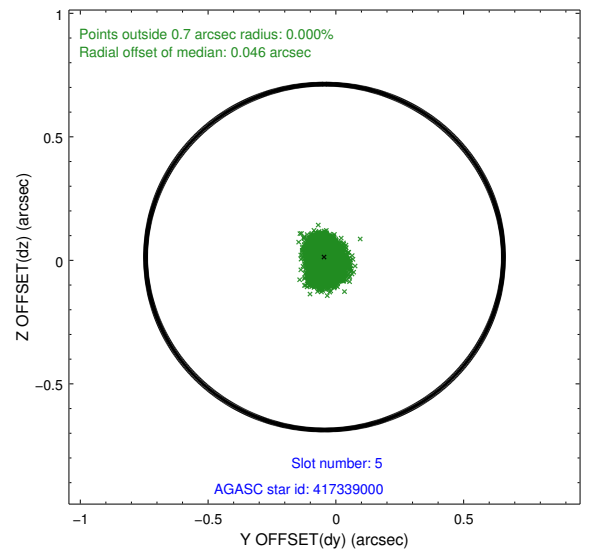
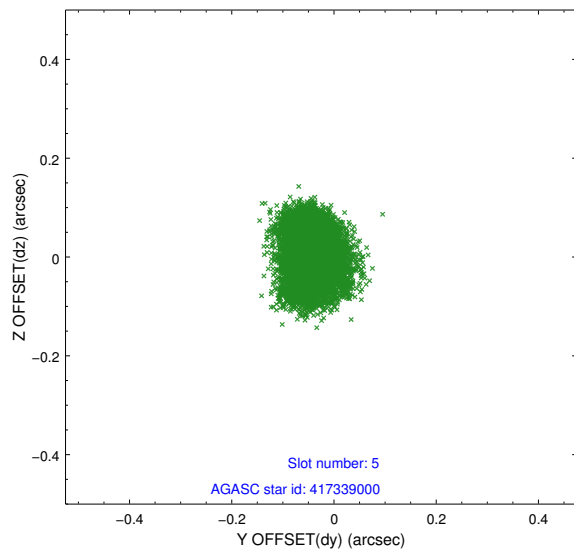
### 2.4.1 Slot 3



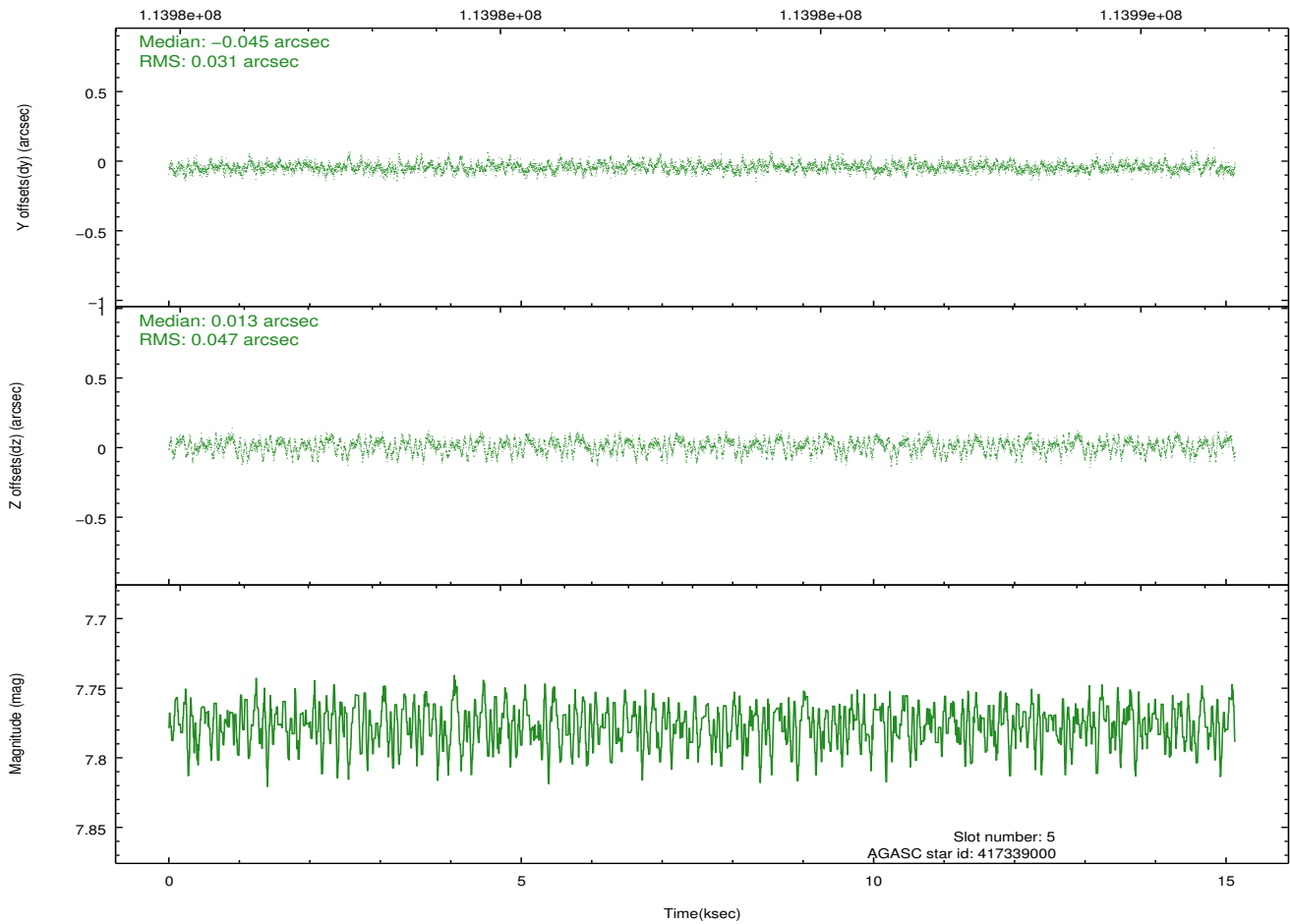
## 2.4.2 Slot 4



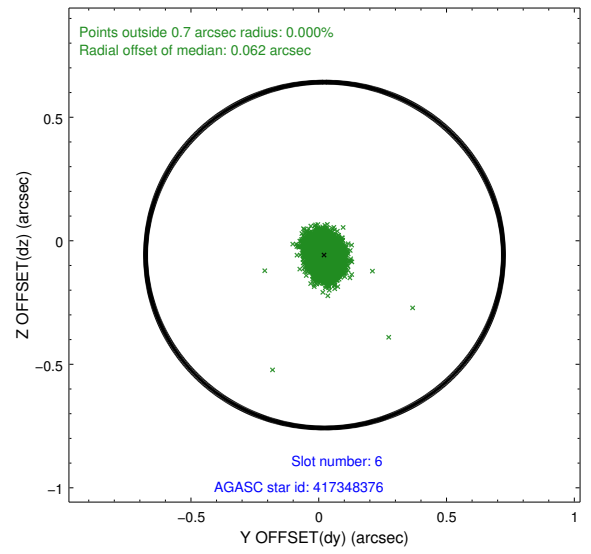
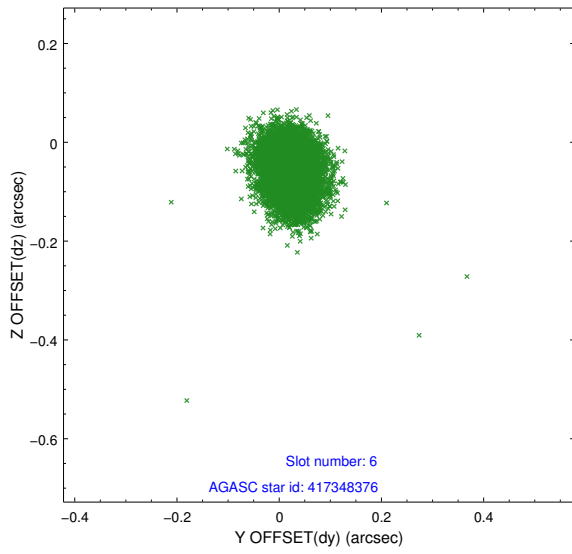
### 2.4.3 Slot 5



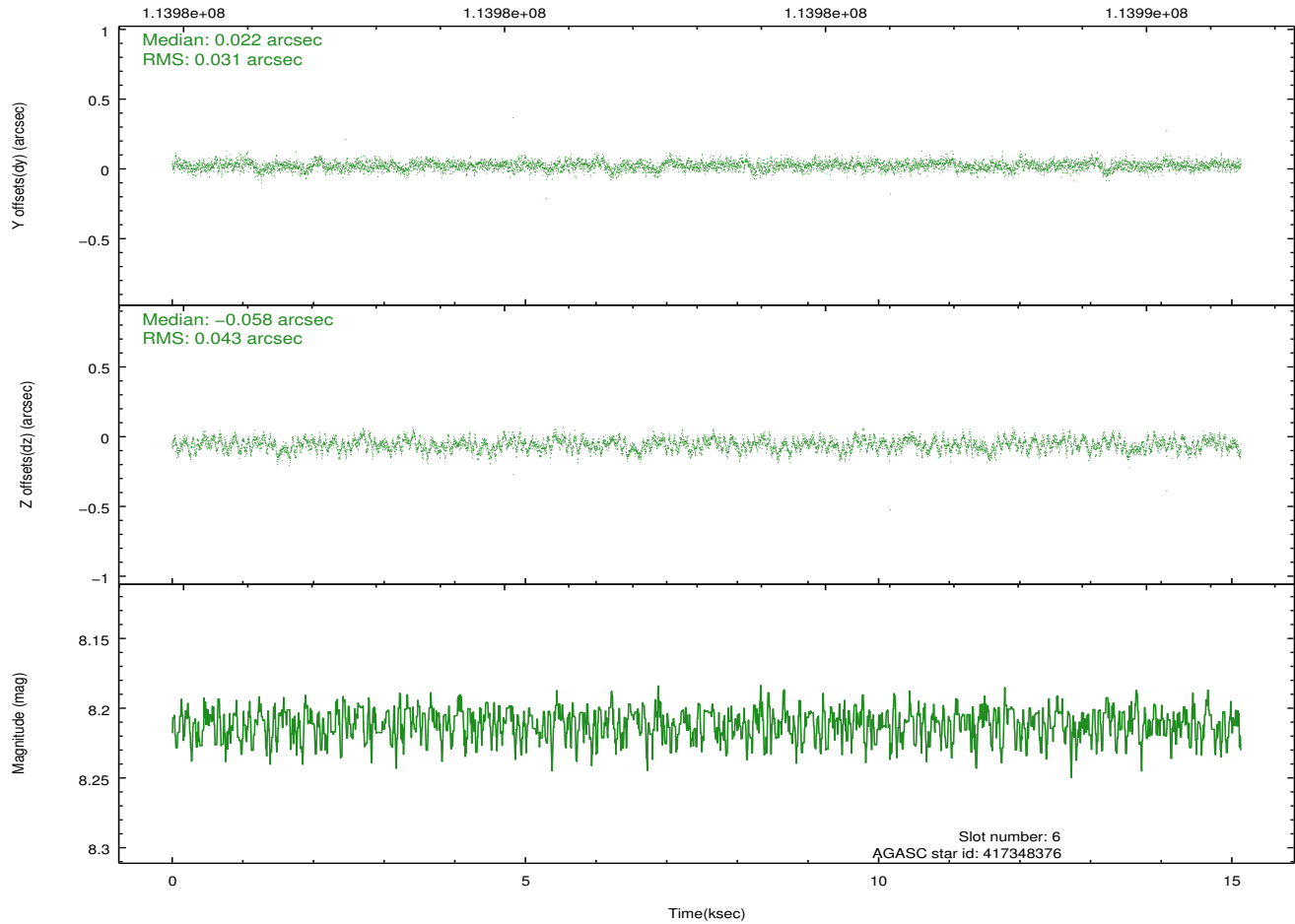
Time (s)



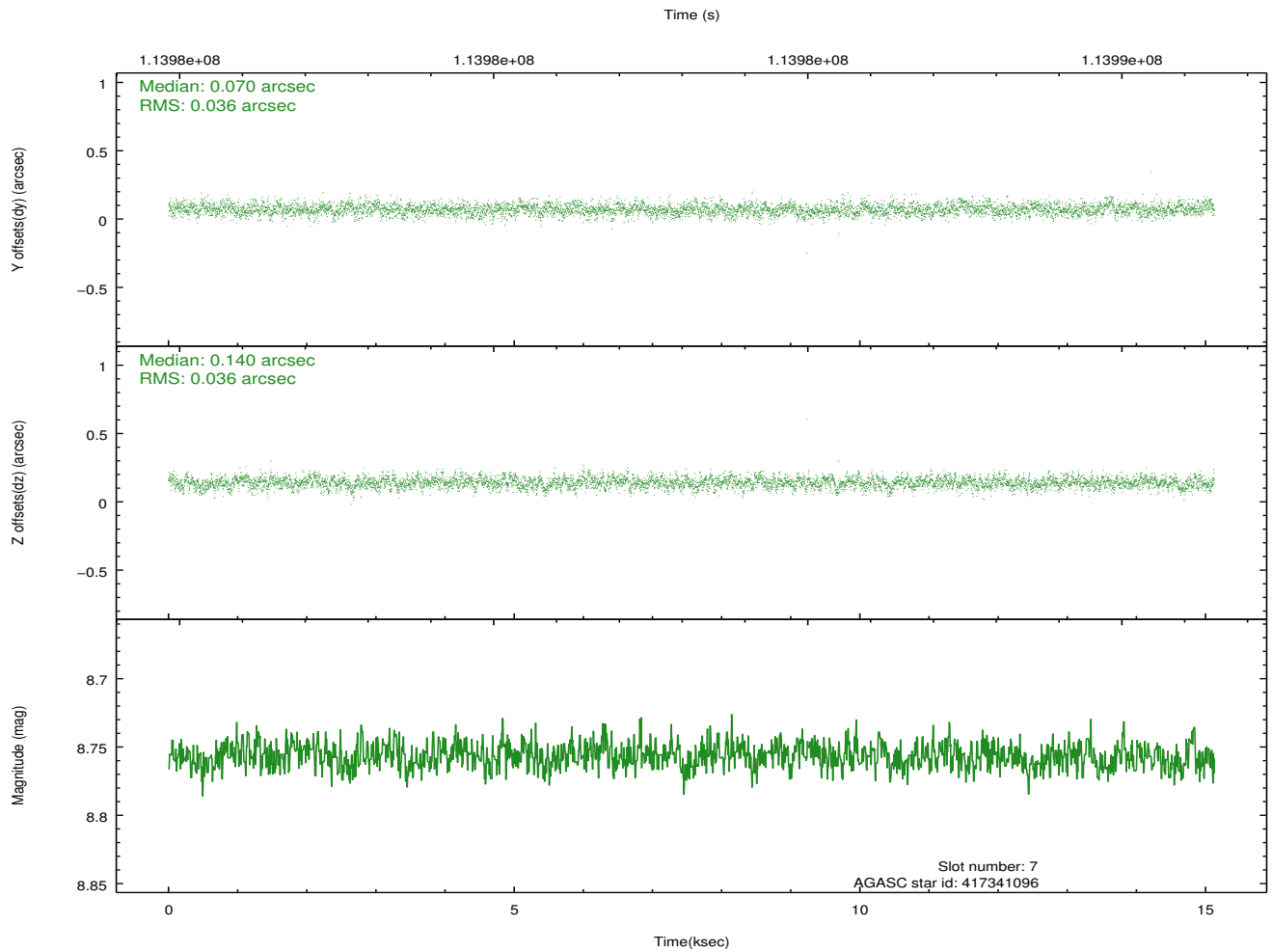
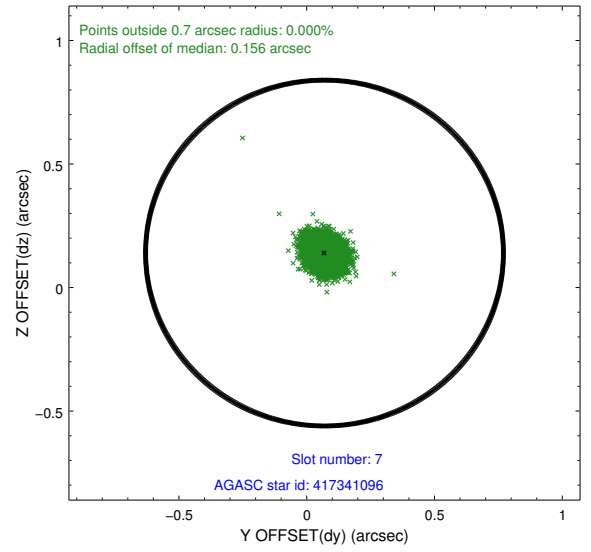
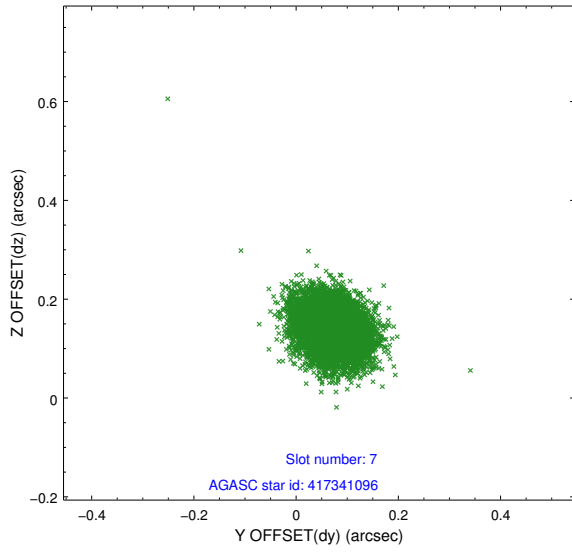
## 2.4.4 Slot 6



Time (s)

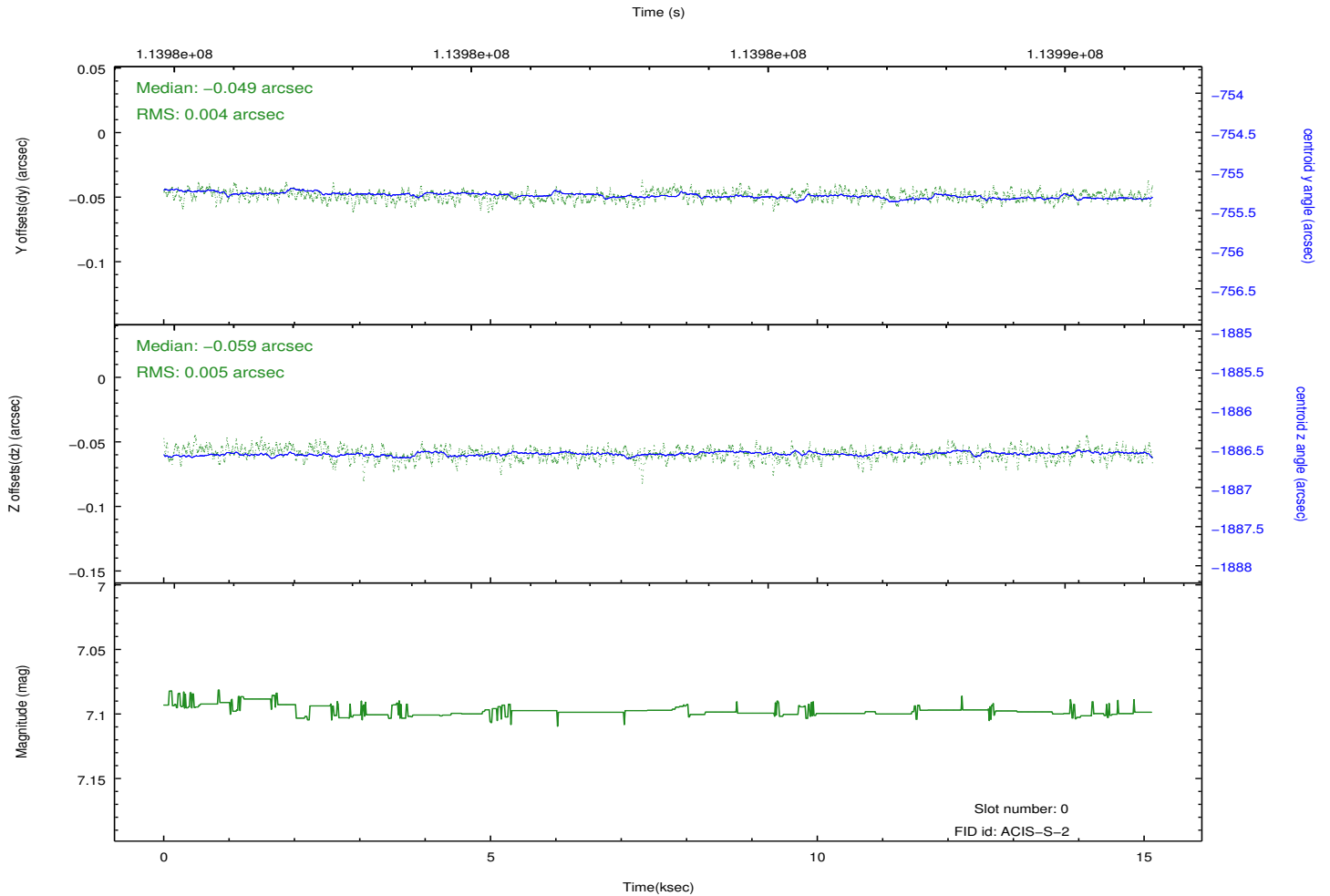
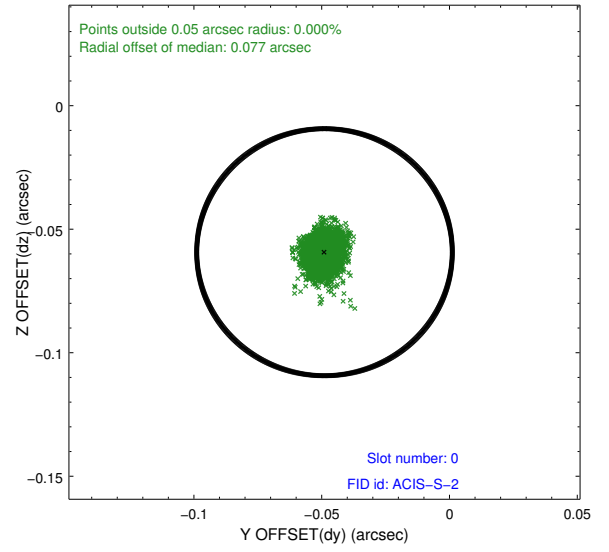
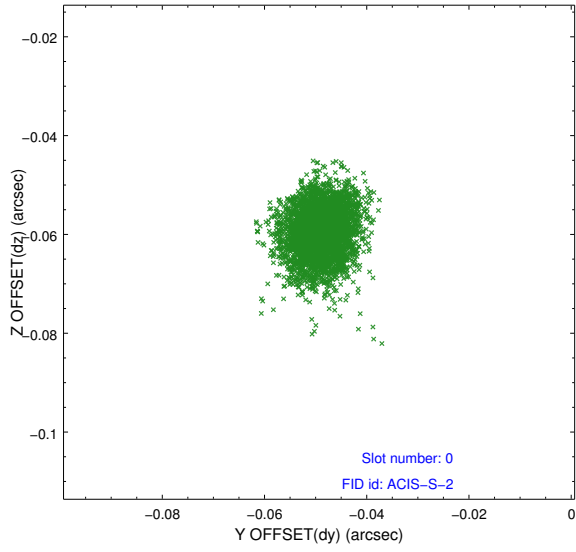


### 2.4.5 Slot 7

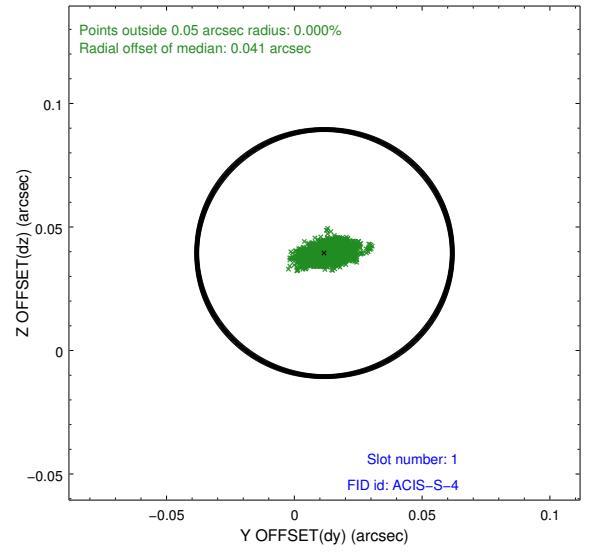
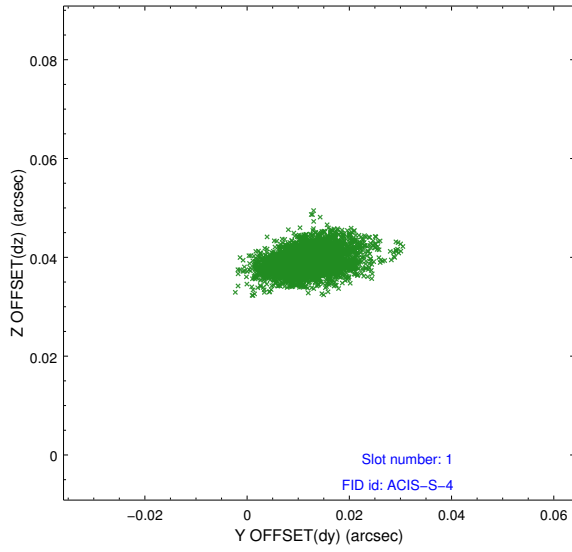


## 2.5 FID Slots

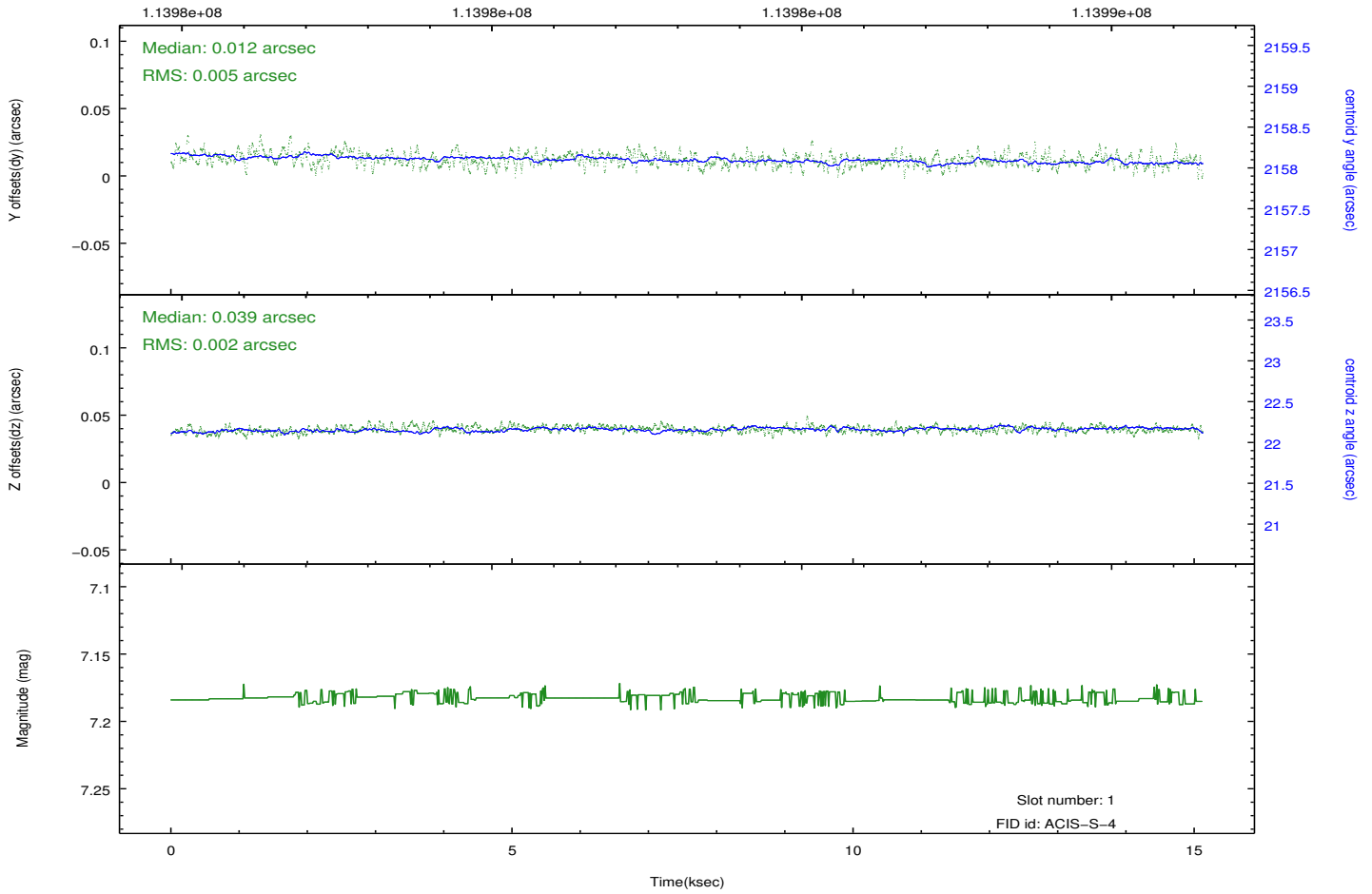
### 2.5.1 Slot 0



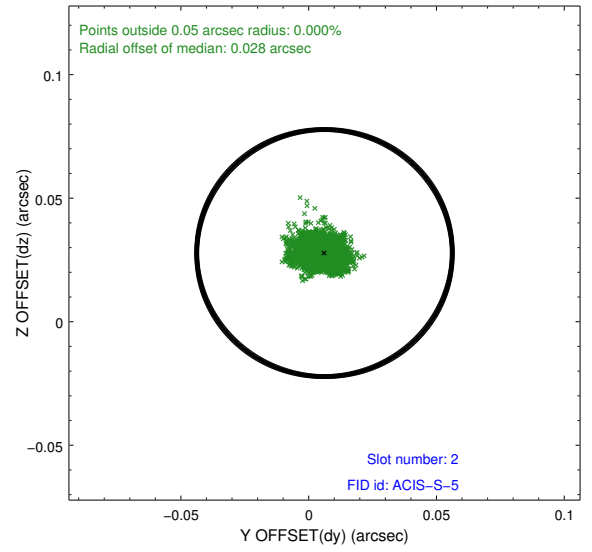
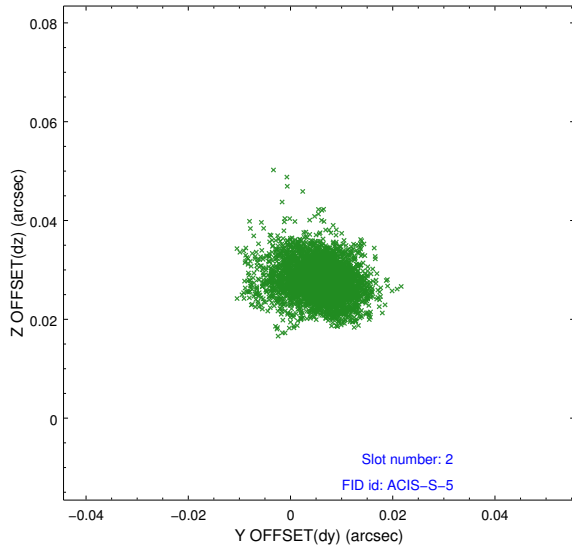
## 2.5.2 Slot 1



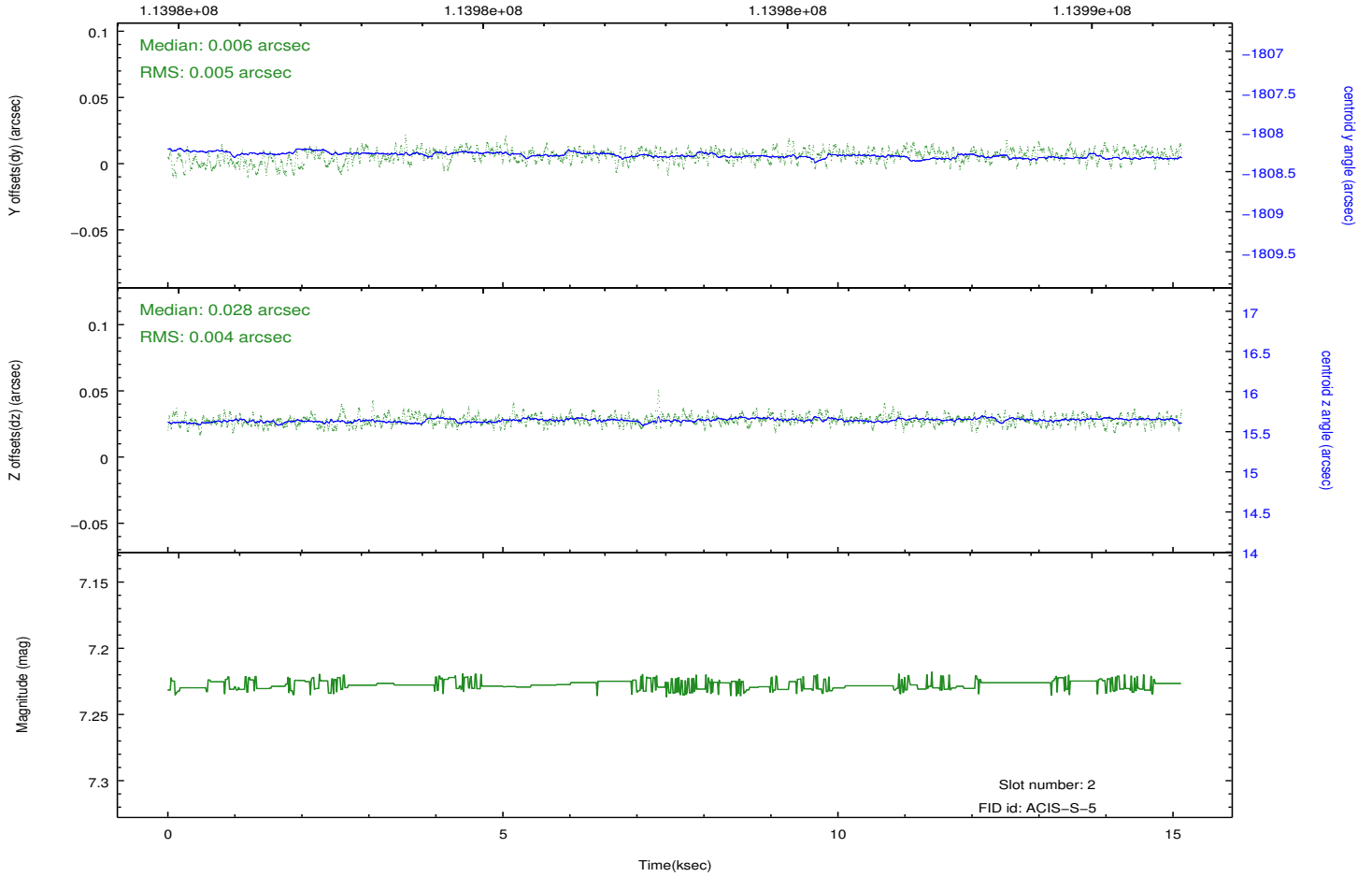
Time (s)



### 2.5.3 Slot 2

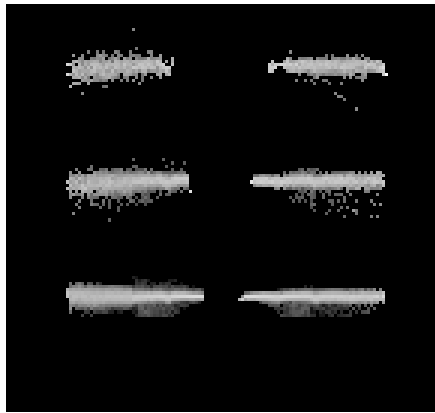


Time (s)

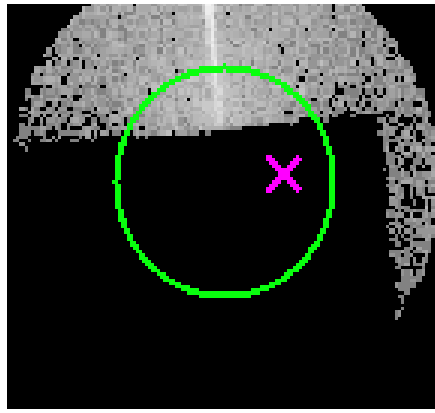


### 3 Gratings

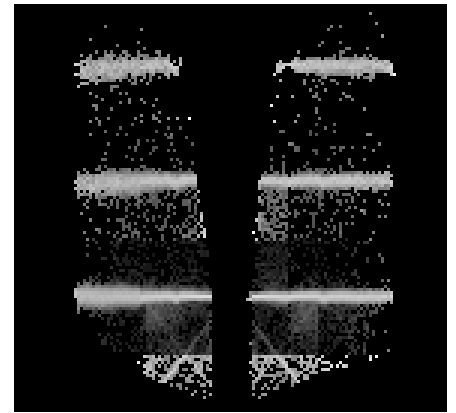
#### 3.1 HEG Arm



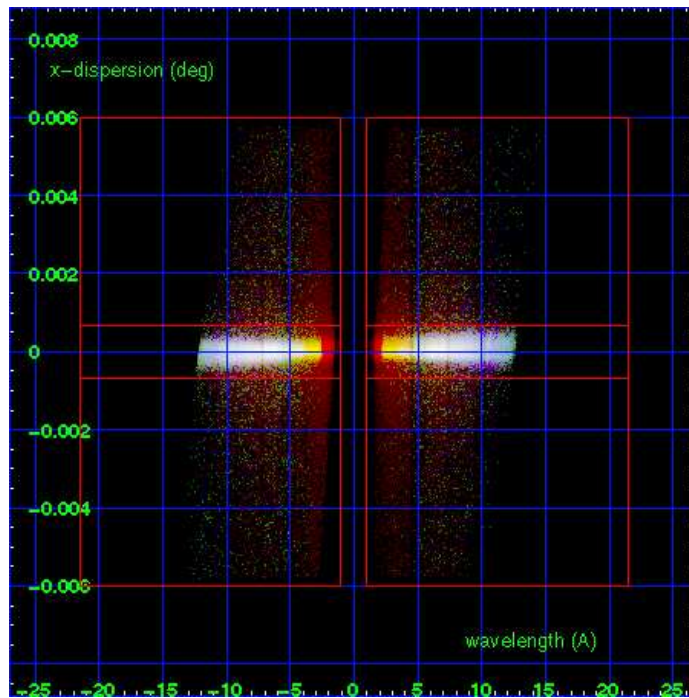
HEG Order Sort 123



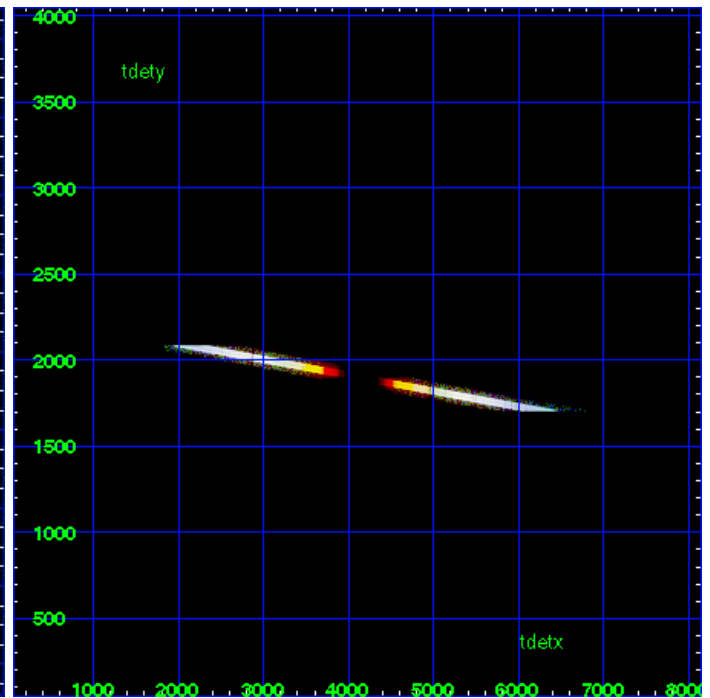
HEG Zero Order



HEG Order Sort ALL

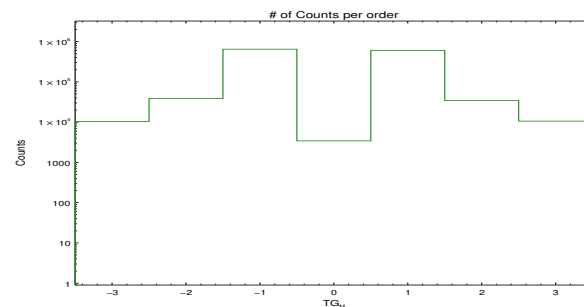


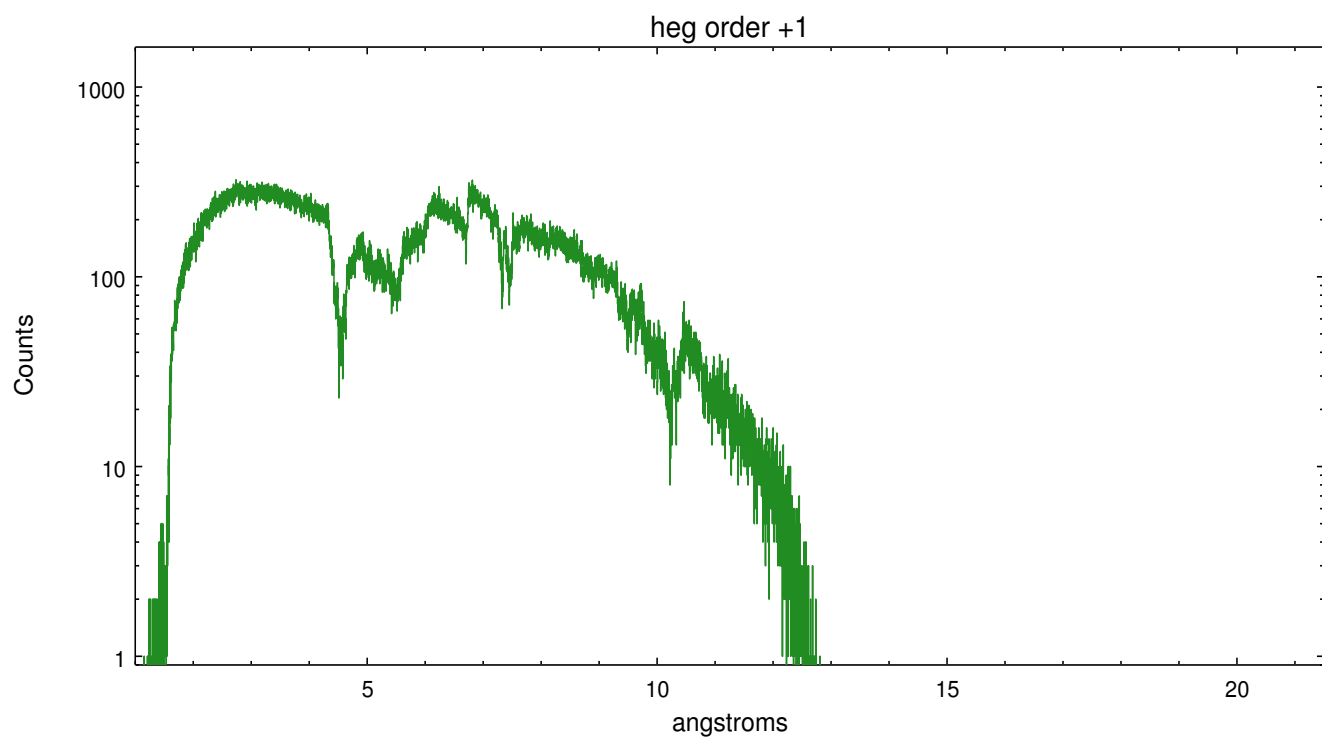
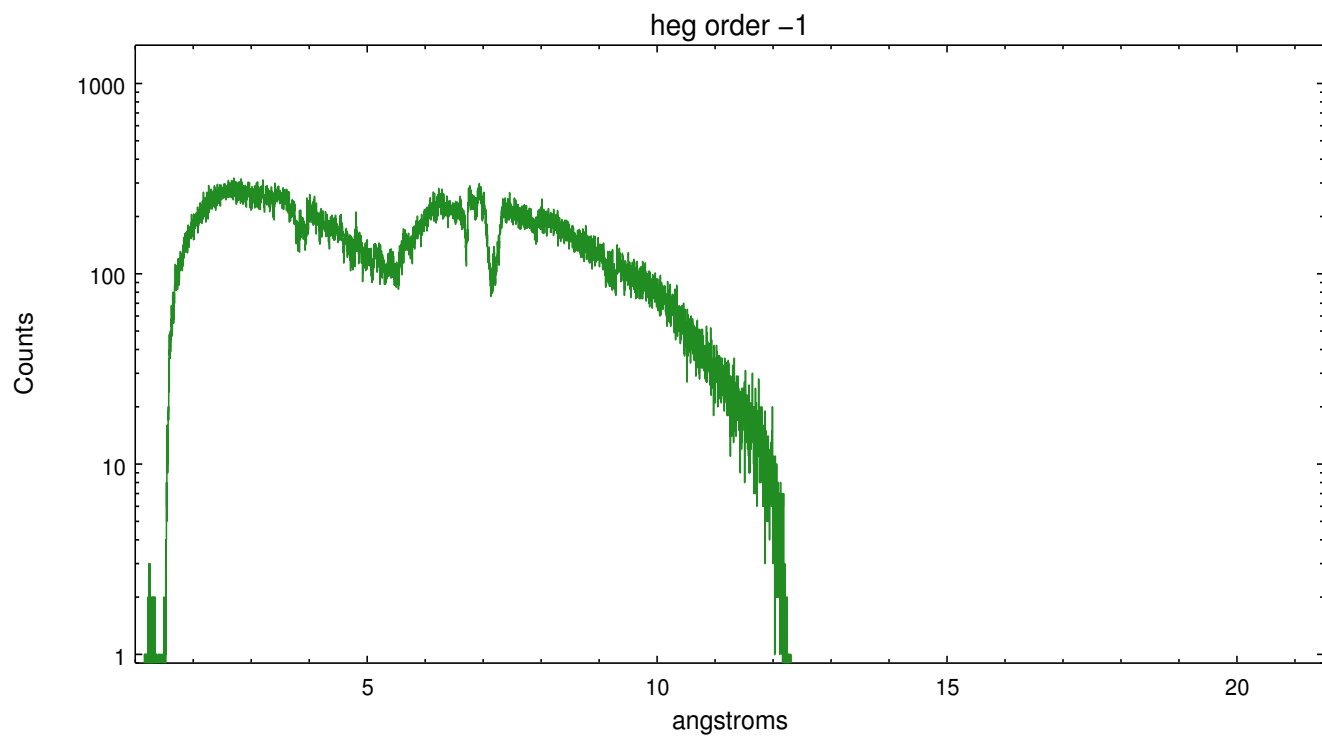
Spot Image HEG



Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	10355	38783	647234	3417	605487	34473	10576

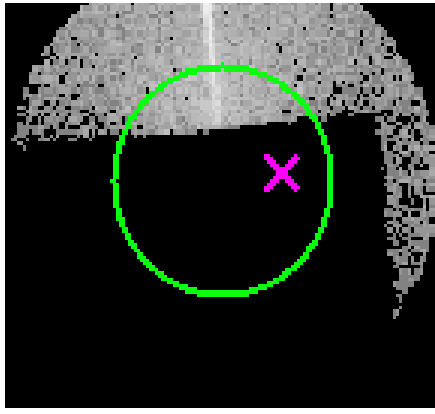




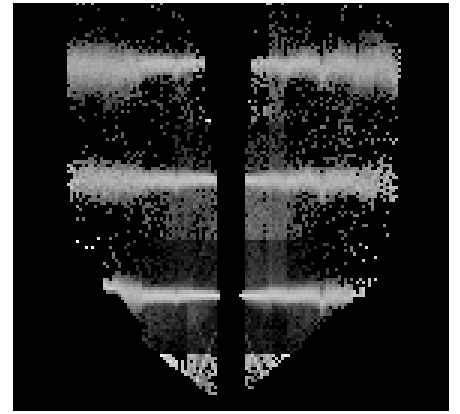
### 3.2 MEG Arm



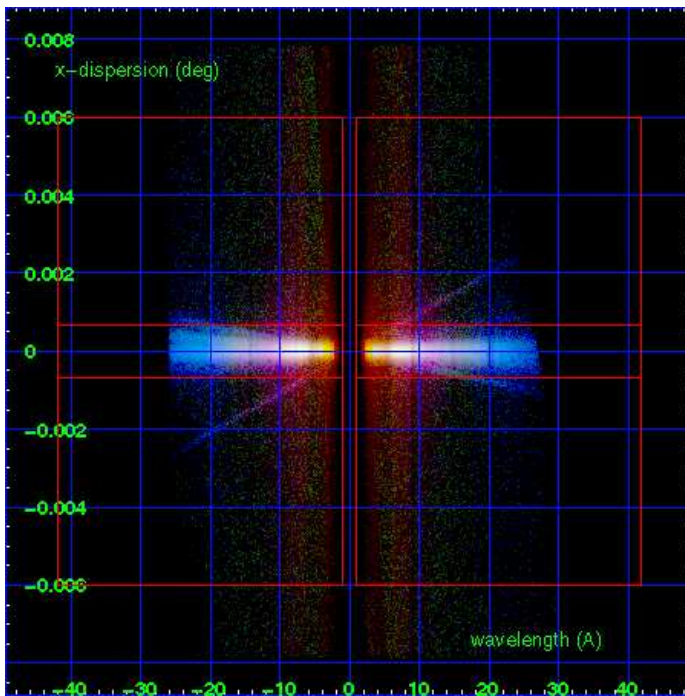
MEG Order Sort 123



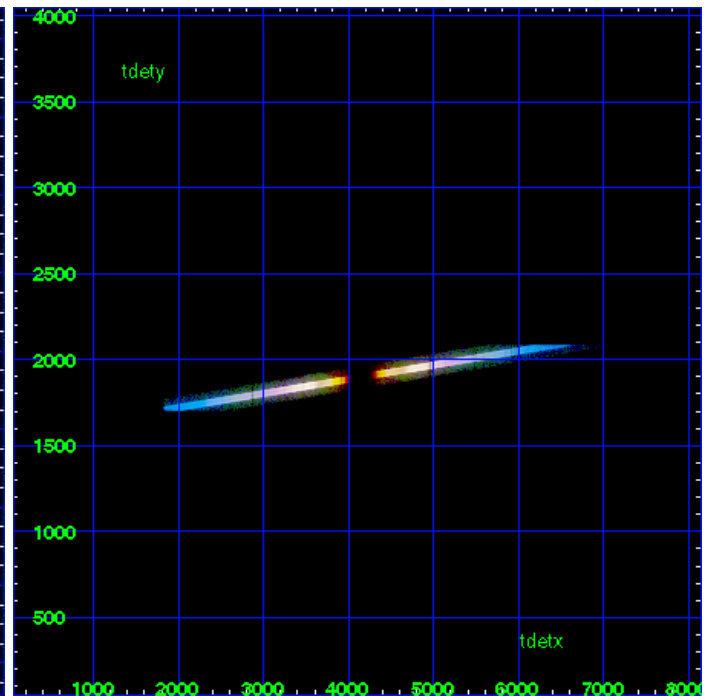
MEG Zero Order



MEG Order Sort ALL

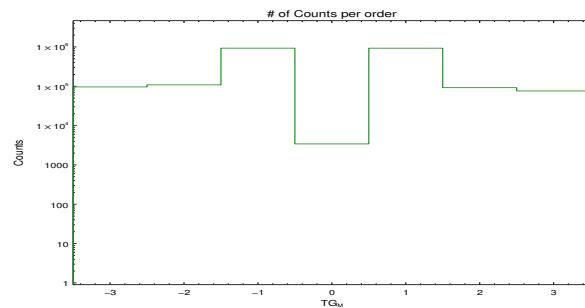


Spot Image MEG

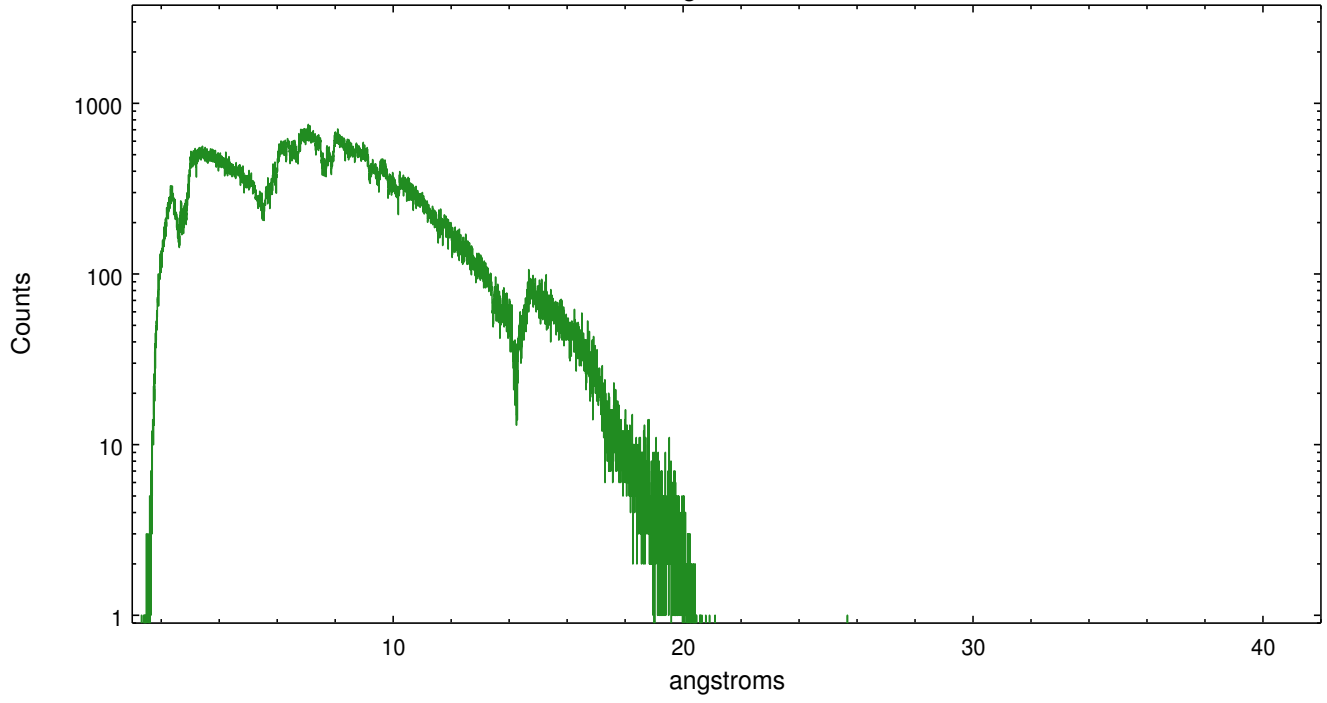


Full Detector MEG

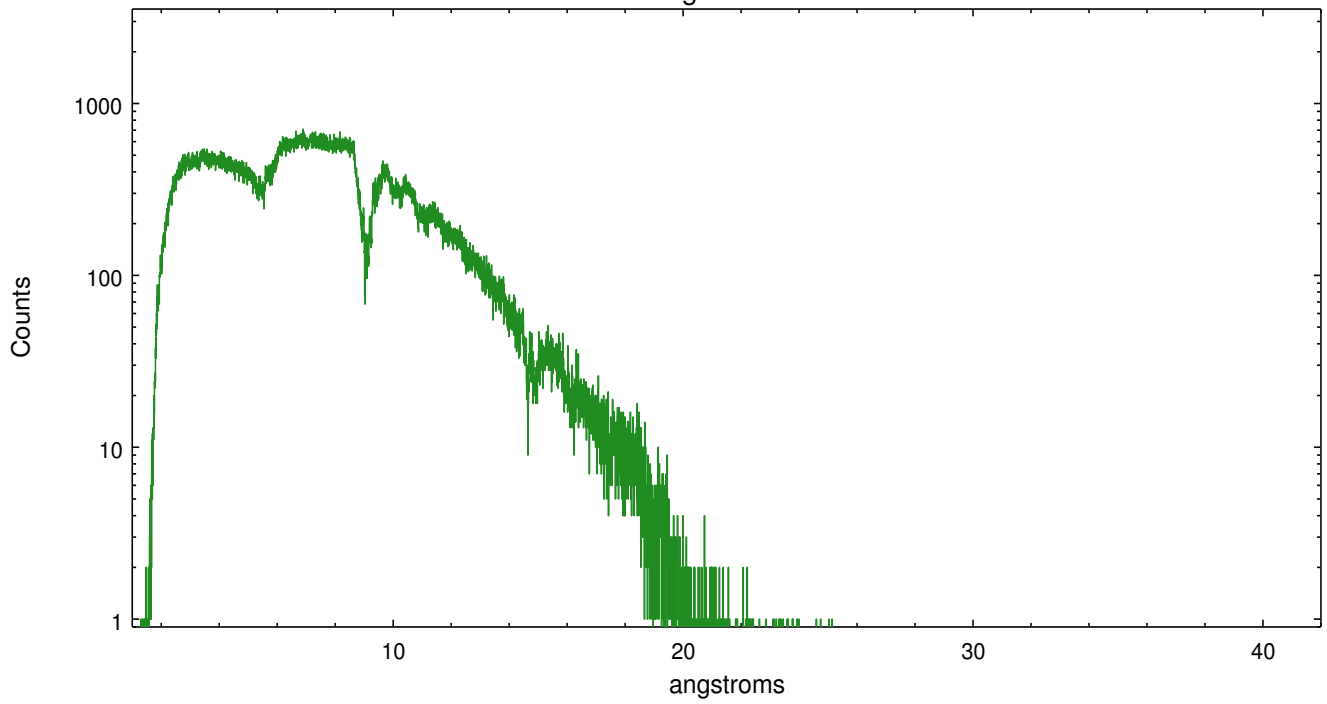
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	96083	108429	929234	3417	928820	91995	75949



meg order -1



meg order +1



# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.10.16
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	15.126

## A.2 Comments

Zeroth order events were blocked by a spatial exclusion window. Standard data processing software did not correctly locate the zeroth order for this reason. Manual intervention was used to input the correct sky coordinates (x=4080.82, y=4094.3) 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.

===

The spatial exclusion window was not centered on the zeroth order. As a result, some events outside the spatial exclusion window, consisting of background and readout streak, are included in the counts for the zeroth order. The counts should not be considered a measurement of zeroth order flux.

===

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.