

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 11074 - L2 Version 3  
Chandra X-Ray Center

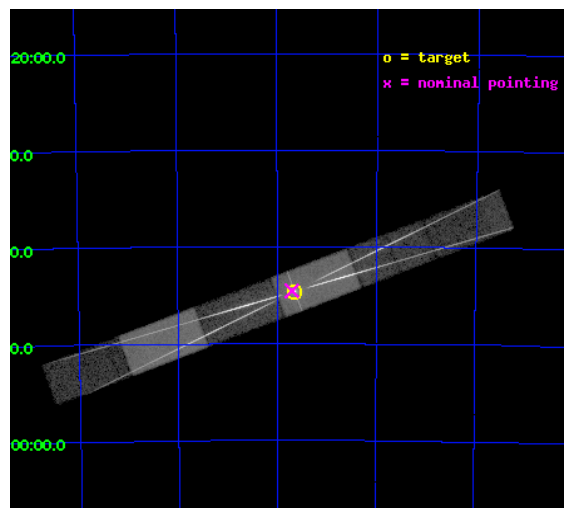
L2 Processing Date : Jun 19 2012

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# 1 Front

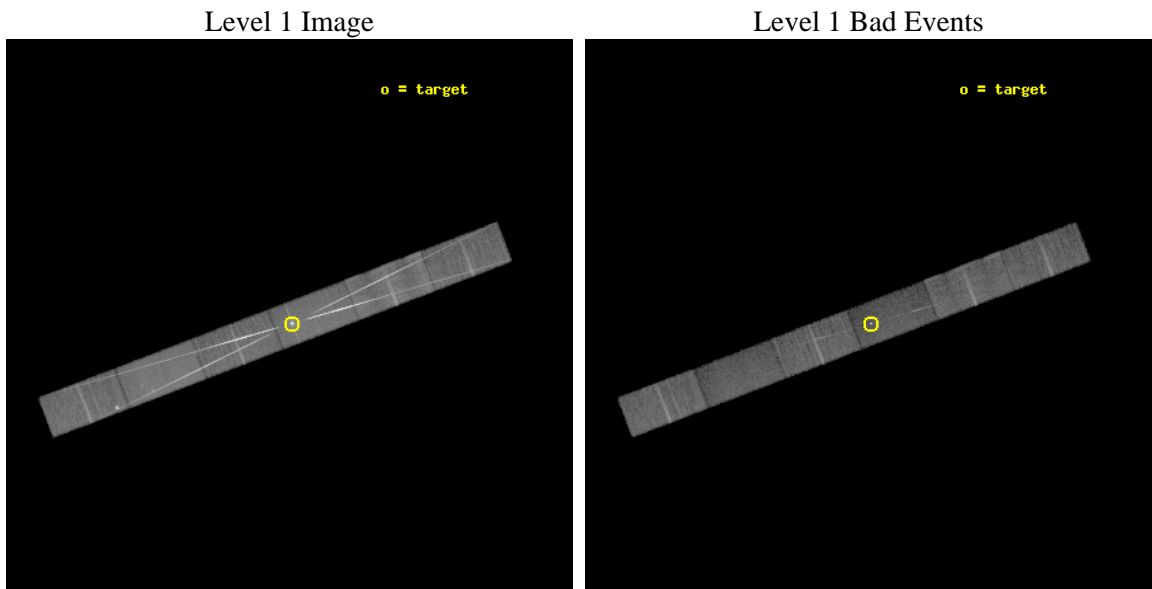
seq_num	401109	Sequence number
obs_id	11074	Observation id
title	Deep Chandra Observations of the Black Hole LMC X-1	Proposal title
observer	Dr. Michael Nowak	Principal investigator
object	LMC X-1	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	84.911667	Observer's specified target RA [deg]
dec_targ	-69.74325	Observer's specified target Dec [deg]
ra_nom	84.925339166025	Nominal RA [deg]
dec_nom	-69.742321393831	Nominal Dec [deg]
roll_nom	339.16944230831	Nominal Roll [deg]
revision	3	Processing version of data
ontime	17569.499876857	Sum of GTIs [s]
livetime	17155.349555815	Livetime [s]
ontime4	17569.499876857	Sum of GTIs [s]
ontime5	17569.499876857	Sum of GTIs [s]
ontime6	17569.499876857	Sum of GTIs [s]
ontime7	17569.499876857	Sum of GTIs [s]
ontime8	17569.499876857	Sum of GTIs [s]
ontime9	17569.499876857	Sum of GTIs [s]
l2events	415923	Number of level 2 events



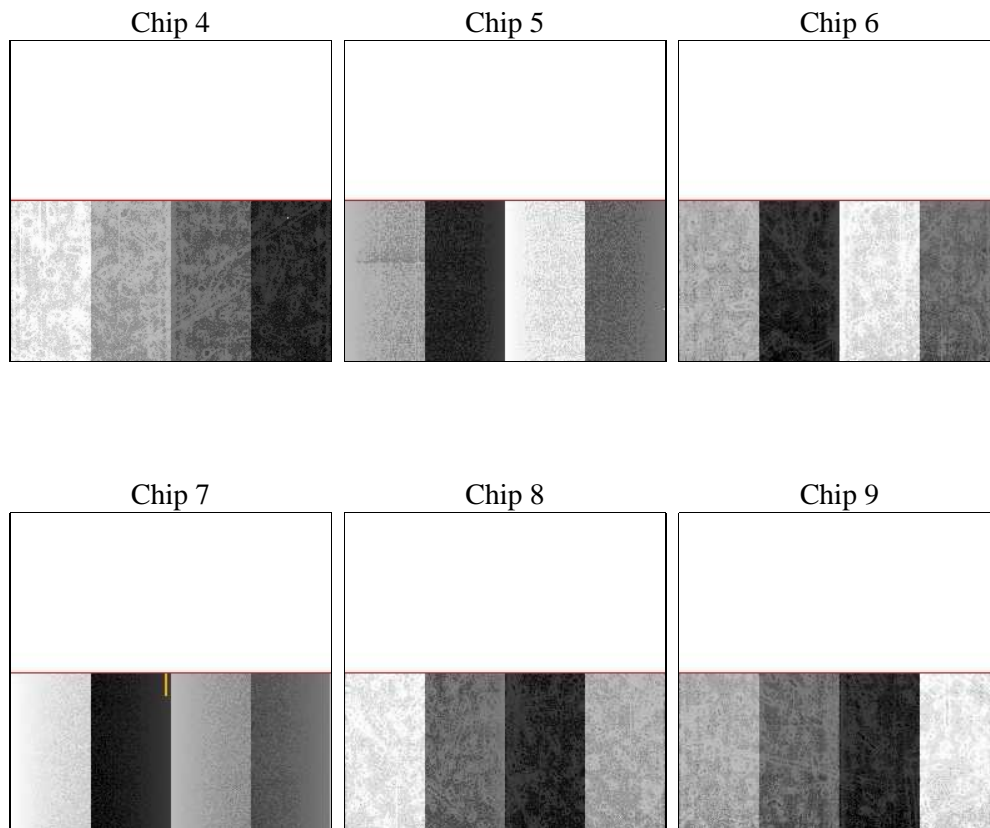
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	17500.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	17569.499876857	Sum of GTIs [s]
caldbver	4.4.10	&#160	ontime4	17569.499876857	Sum of GTIs [s]
date	2012-06-19T07:31:14	Date and time of file creation	ontime5	17569.499876857	Sum of GTIs [s]
revision	2	Processing version of data	ontime6	17569.499876857	Sum of GTIs [s]
			ontime7	17569.499876857	Sum of GTIs [s]
			ontime8	17569.499876857	Sum of GTIs [s]
			ontime9	17569.499876857	Sum of GTIs [s]
			l1events	872858	Number of level 1 events

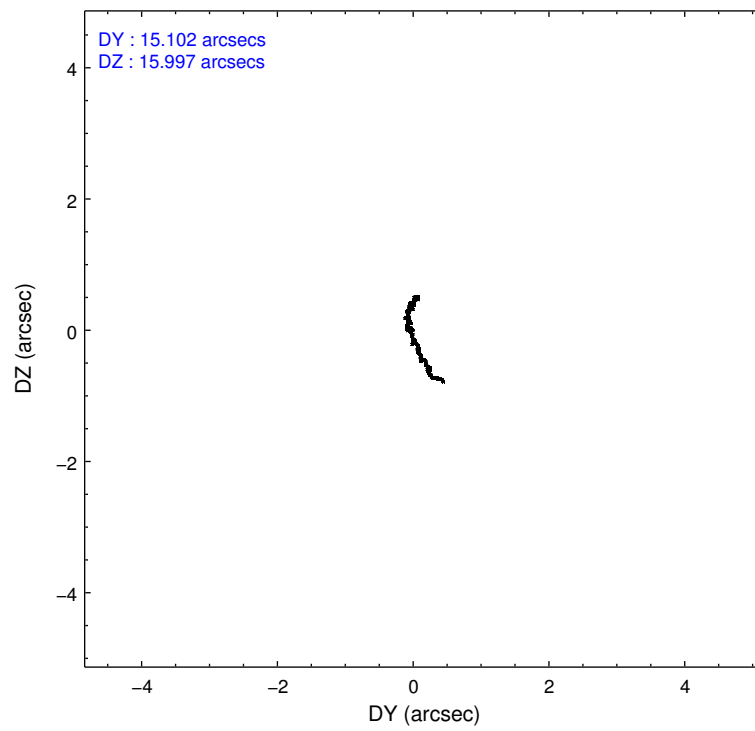
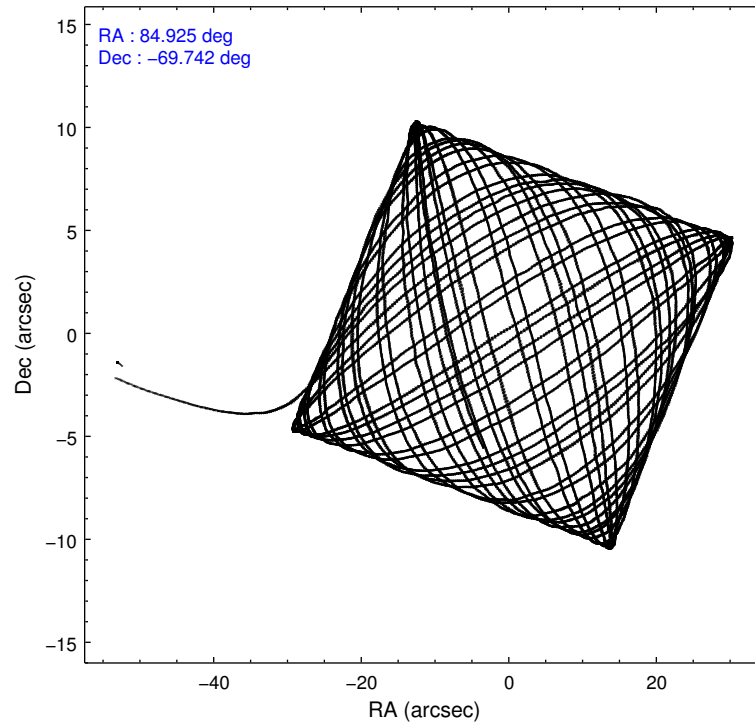
### 2.1.4 Events

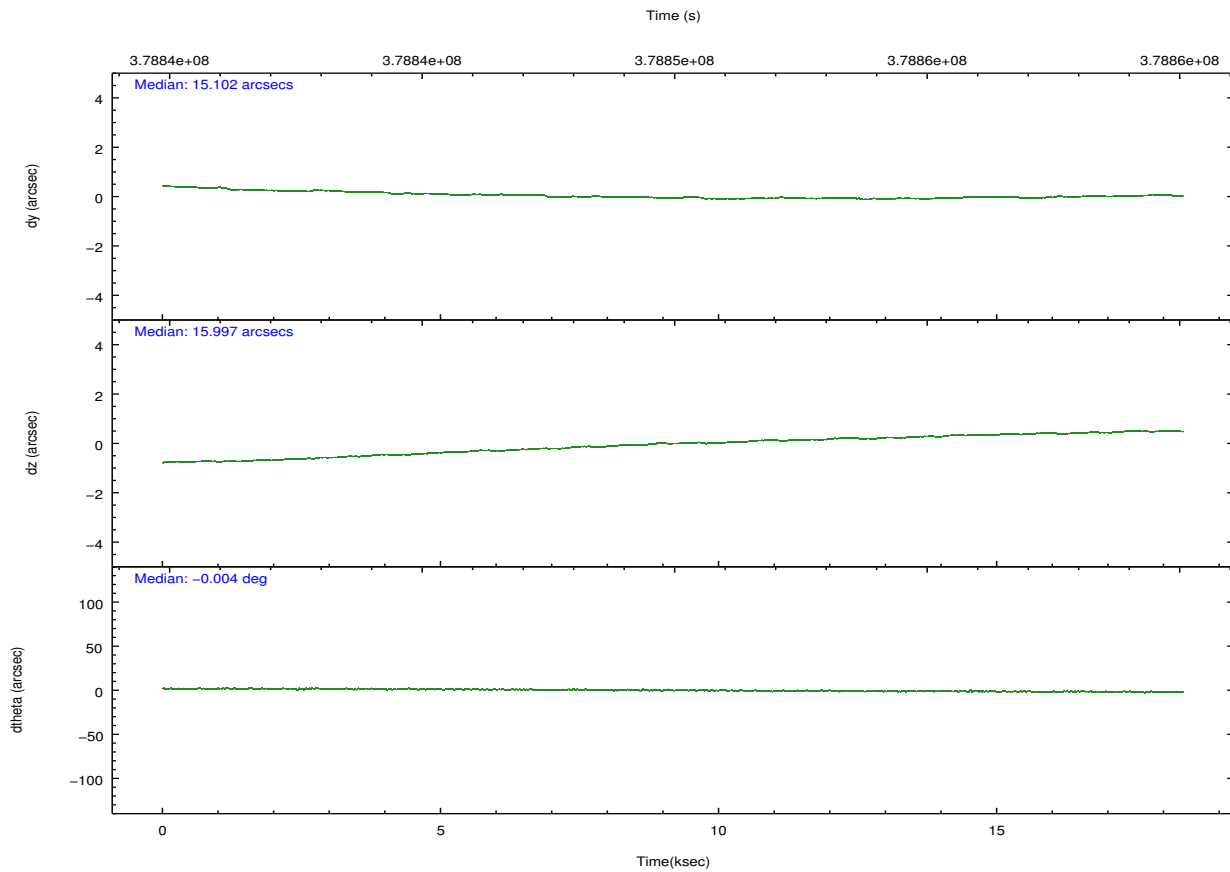
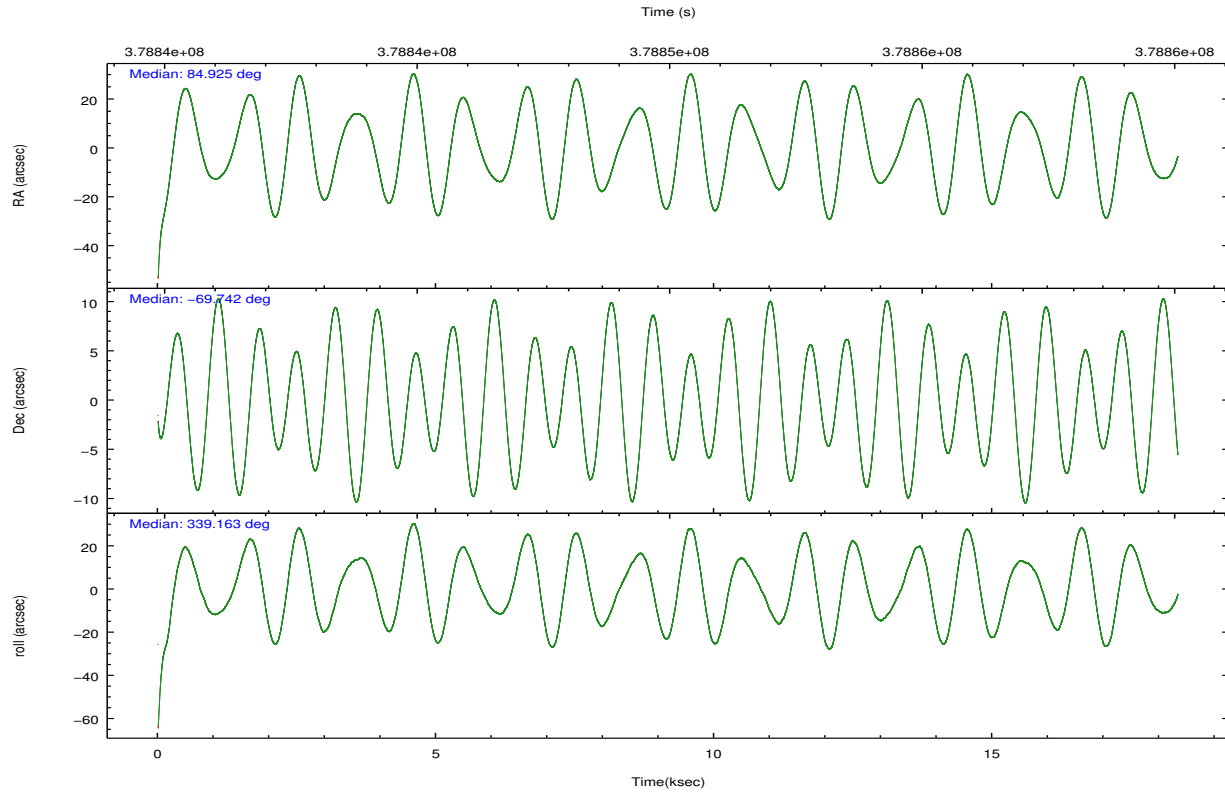
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	100796	137238	191768	202970	153569	86517	grade 0 events	11204	15118	87283	28526	46226	10571
rejected events	82610	55274	75452	52084	79522	68175		11%	11%	45%	14%	30%	12%
rejected %	81%	40%	39%	25%	51%	78%	grade 1 events	90	273	721	527	280	58
								0%	0%	0%	0%	0%	0%
							grade 2 events	2787	23336	14184	36833	10834	2859
								2%	17%	7%	18%	7%	3%
							grade 3 events	1324	5696	4988	16562	4568	1490
								1%	4%	2%	8%	2%	1%
							grade 4 events	1169	5709	5103	16311	4369	1394
								1%	4%	2%	8%	2%	1%
							grade 5 events	2963	9604	3548	11236	4744	3418
								2%	6%	1%	5%	3%	3%
							grade 6 events	1704	32116	4769	52663	8054	2031
								1%	23%	2%	25%	5%	2%
							grade 7 events	79555	45386	71172	40312	74494	64696
								78%	33%	37%	19%	48%	74%

## 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	84.847622	84.92533916602473	CCD I2 on	N	N
[deg] Pointing Dec	-69.747052	-69.74232139383079	CCD I3 on	N	N
[deg] Pointing Roll	338.939907	339.169442308314	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	-183.985022191653	CCD S3 on	Y	Y
[mm] SIM translation stage offset	-6.14	-6.147500391354811	CCD S4 on	Y	Y
[s] Observation start time (MET)	378841650.184000	378839889.80672	CCD S5 on	Y	Y
Observation start date	2010-01-02T17:46:24	2010-01-02T17:18:09	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	378859150.184000	378859927.53273	On-chip summing requested	N	N
Observation end date	2010-01-02T22:38:04	2010-01-02T22:52:07	Subarray requested	CUSTOM	1/2
Read mode	TIMED	TIMED	Subarray start row	1	1
			Subarray row count	512	512
			Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	1.7

## 2.3 Aspect





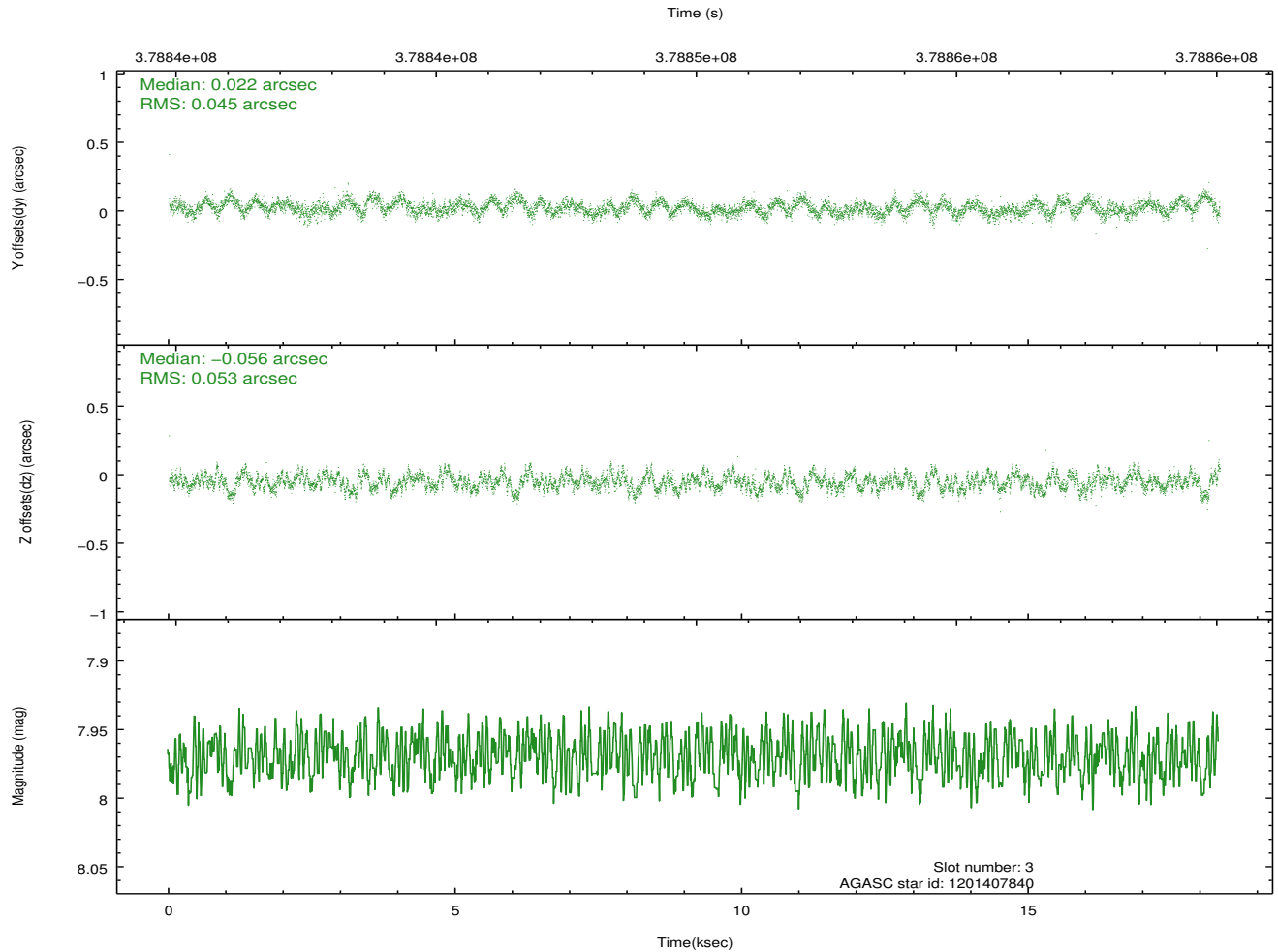
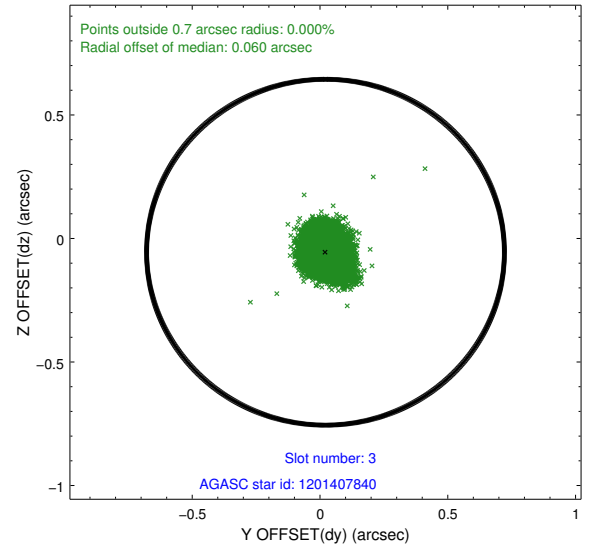
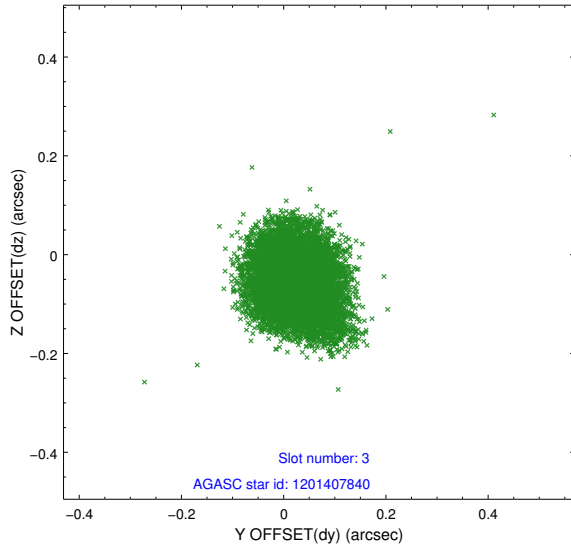
### Slot Statistics

slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-1	6.98	4473	0.067	0.121	0.011	0.018	0.000000	0.000000	928.37	-1859.56
1	FID	ACIS-S-4	6.96	4473	0.143	-0.111	0.016	0.025	0.000000	0.000000	2146.00	44.08
2	FID	ACIS-S-5	7.02	4473	-0.231	0.003	0.018	0.025	0.000000	0.000000	-1820.49	38.10
3	GUIDE	1201407840	7.97	8943	0.022	-0.056	0.074	0.119	83.696303	-70.172201	-756.32	-1946.01
4	GUIDE	1201539448	8.93	8929	0.054	-0.036	0.088	0.142	85.635707	-70.382152	1713.57	-1796.75
5	GUIDE	1201541752	7.40	8945	-0.114	-0.001	0.061	0.095	85.373891	-70.033762	976.37	-733.22
6	GUIDE	1201542672	8.20	8939	0.116	-0.024	0.075	0.118	84.492488	-69.957531	-135.35	-863.89
7	GUIDE	1201540760	8.55	8938	-0.073	0.119	0.077	0.129	84.403691	-70.419249	371.34	-2452.14

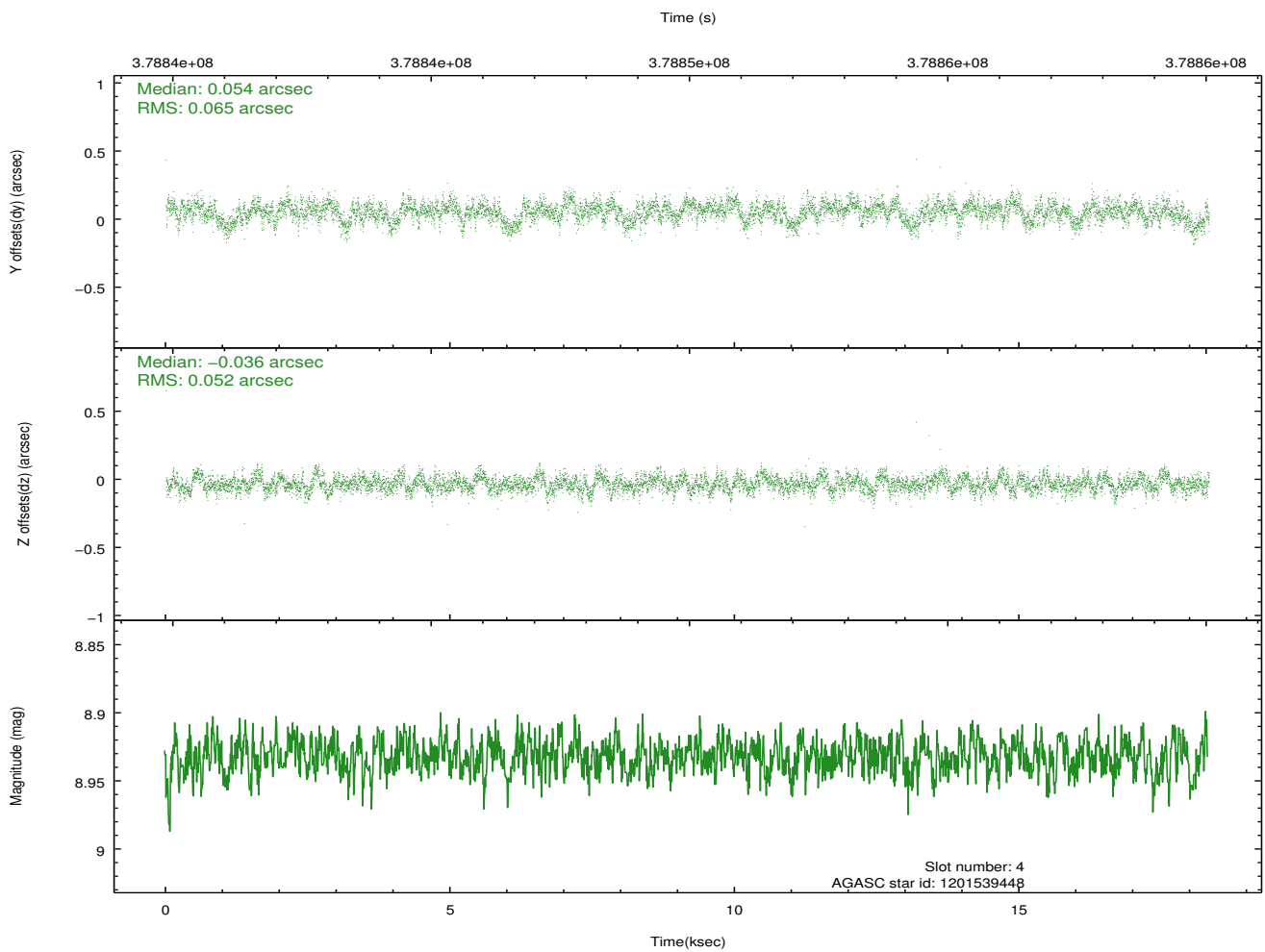
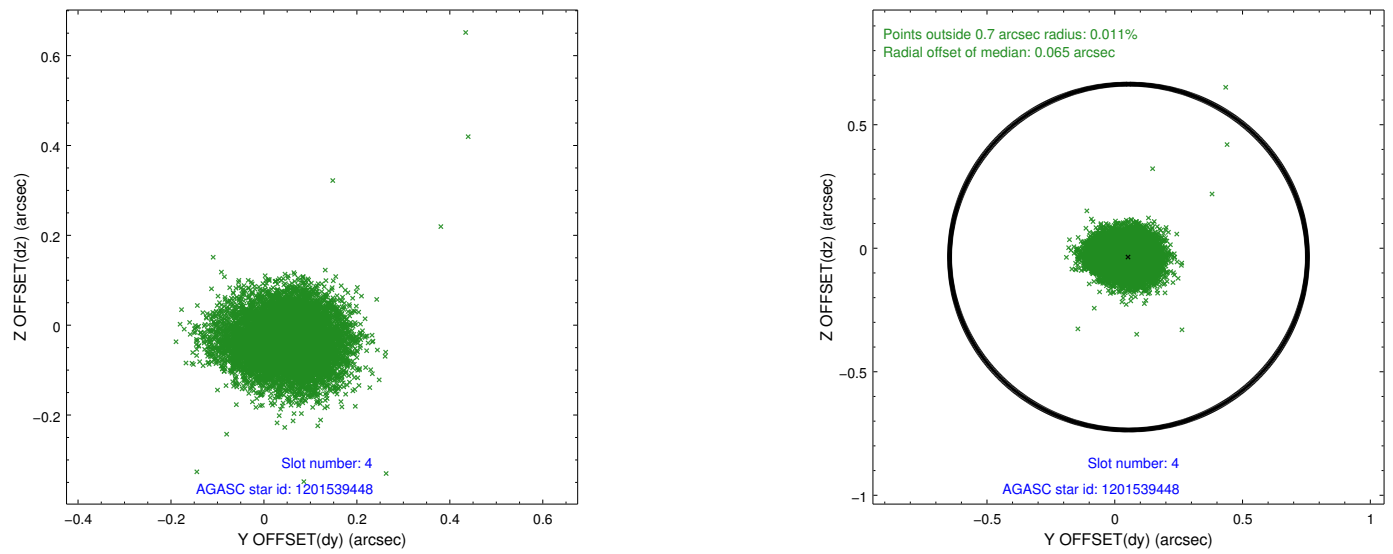
∞

## 2.4 Star Slots

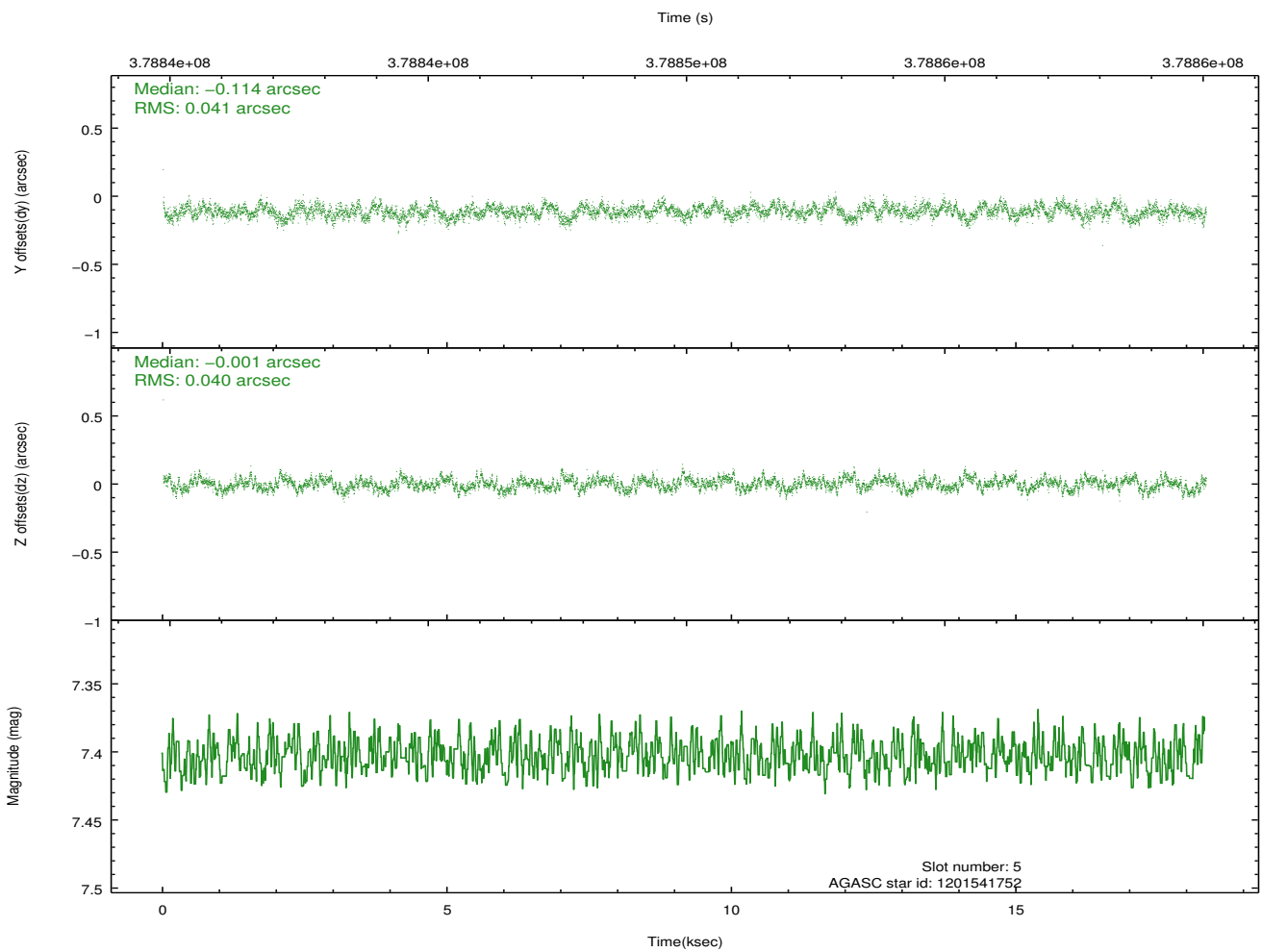
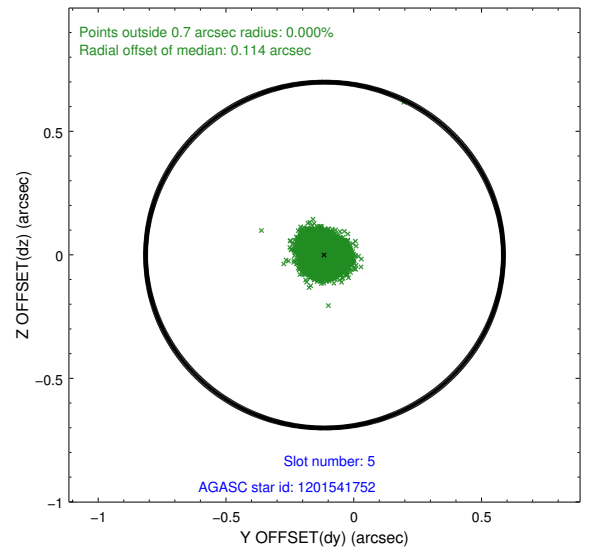
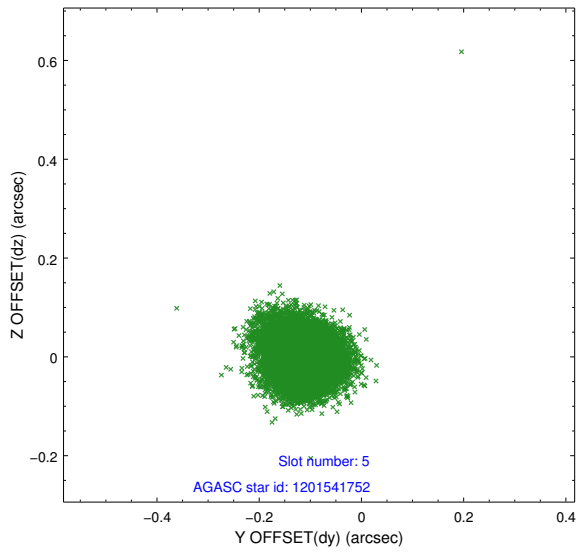
### 2.4.1 Slot 3



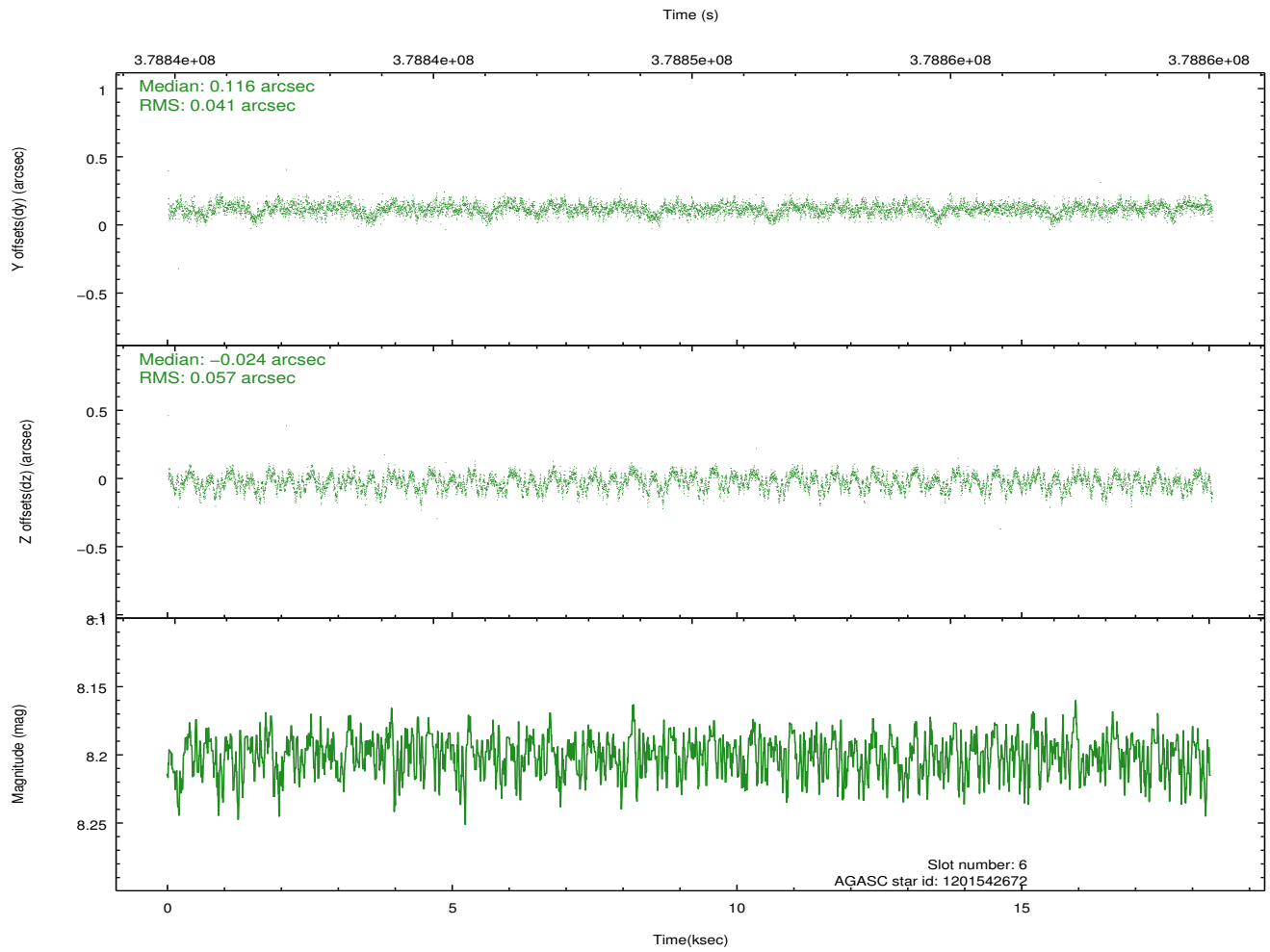
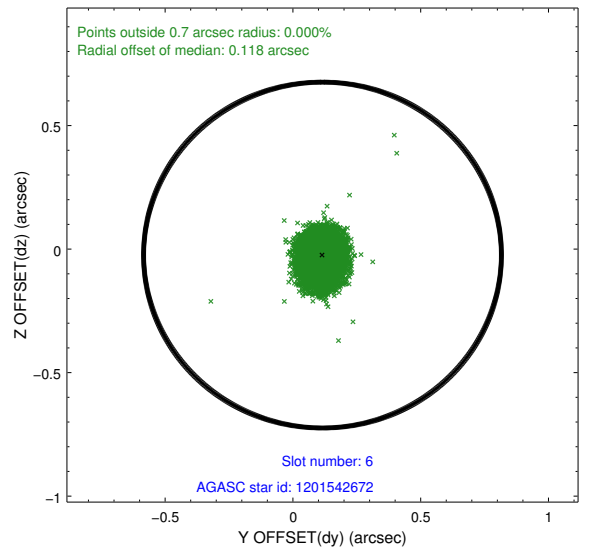
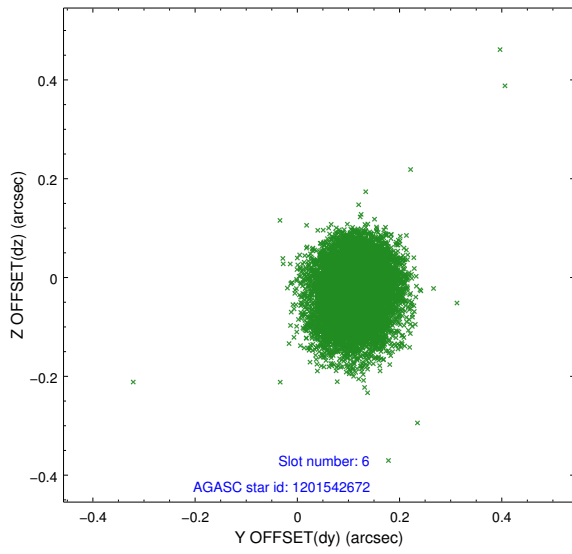
## 2.4.2 Slot 4



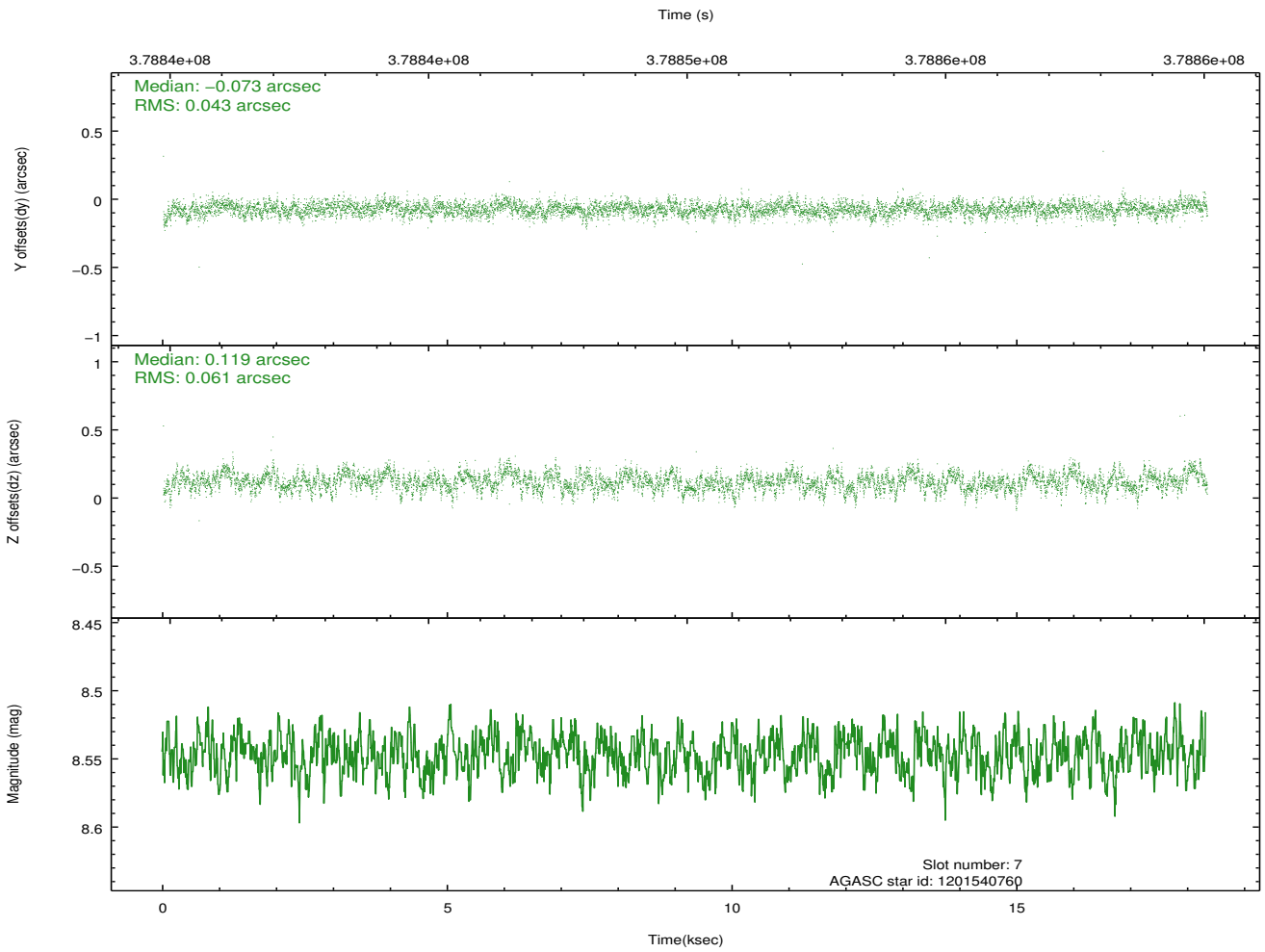
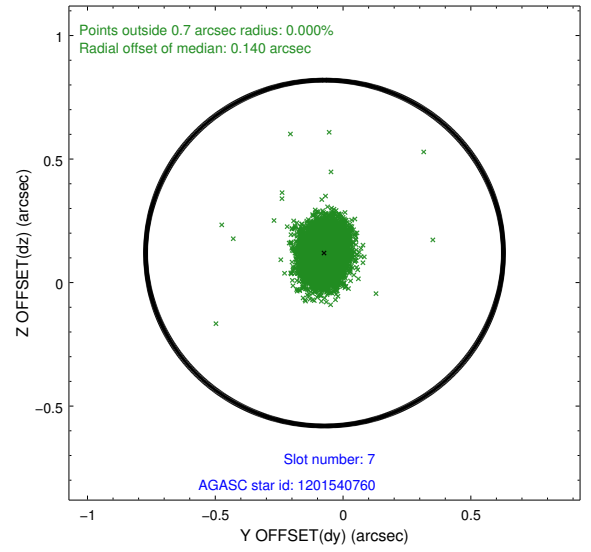
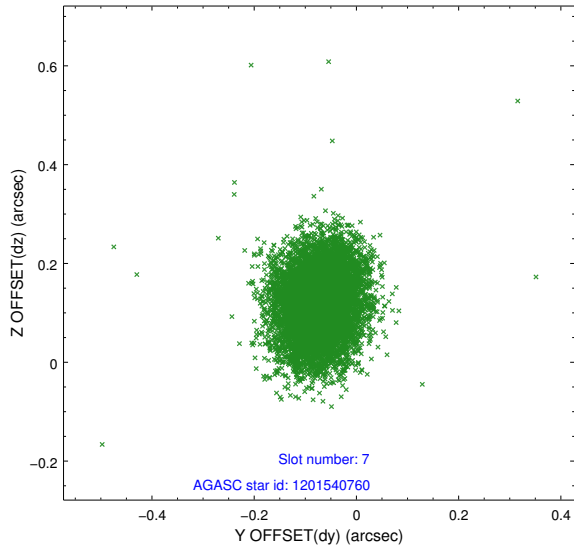
### 2.4.3 Slot 5



### 2.4.4 Slot 6

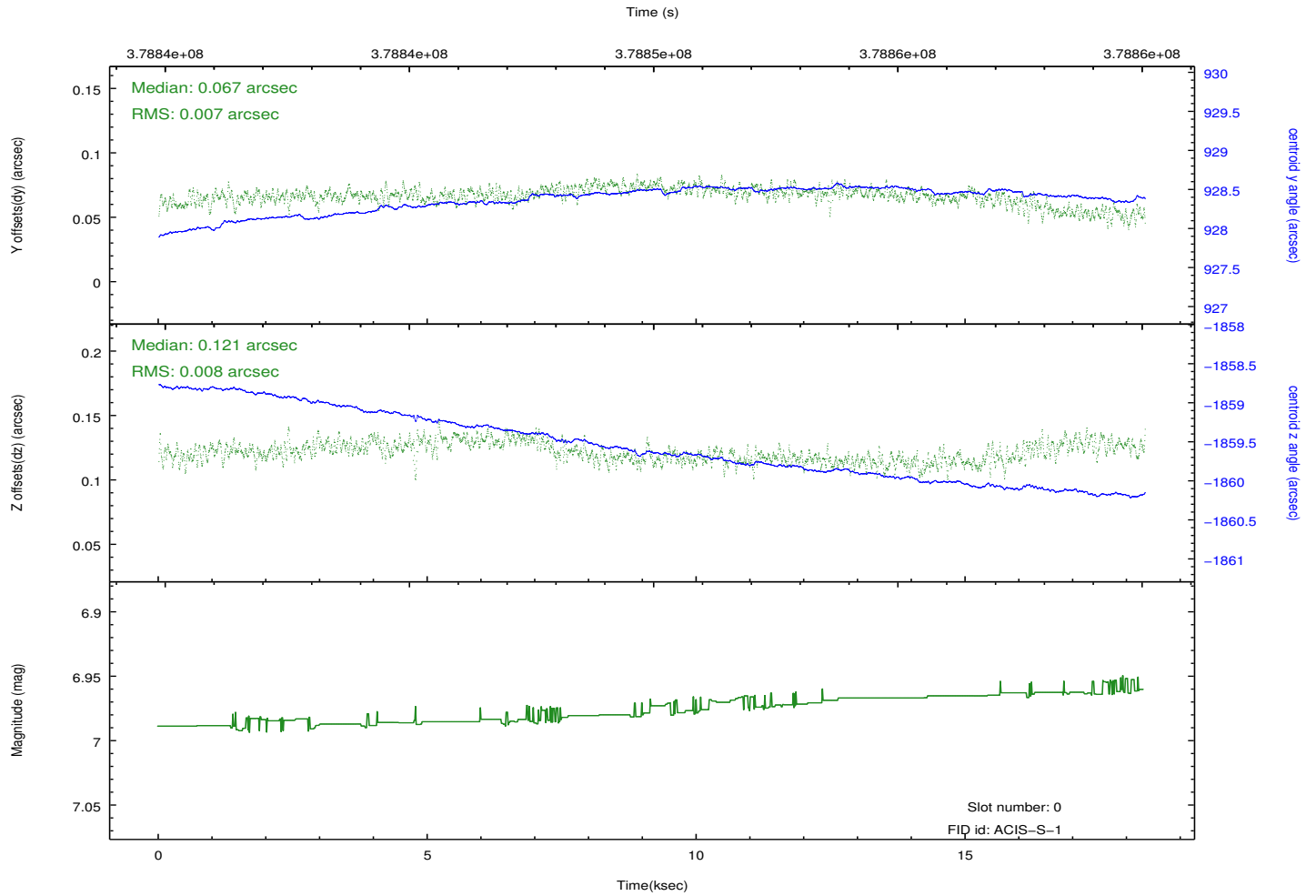
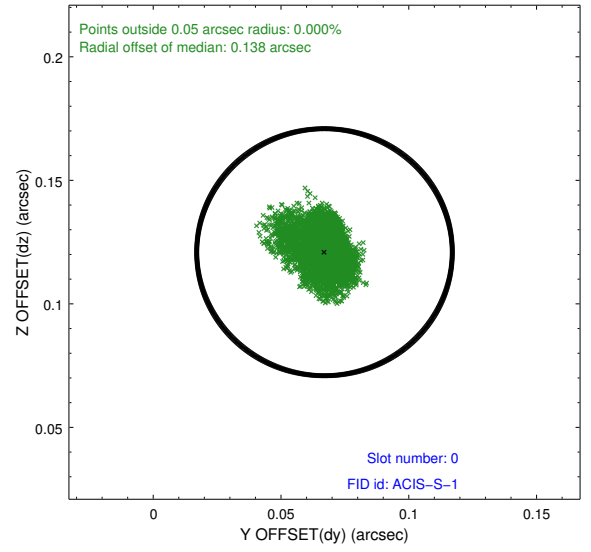
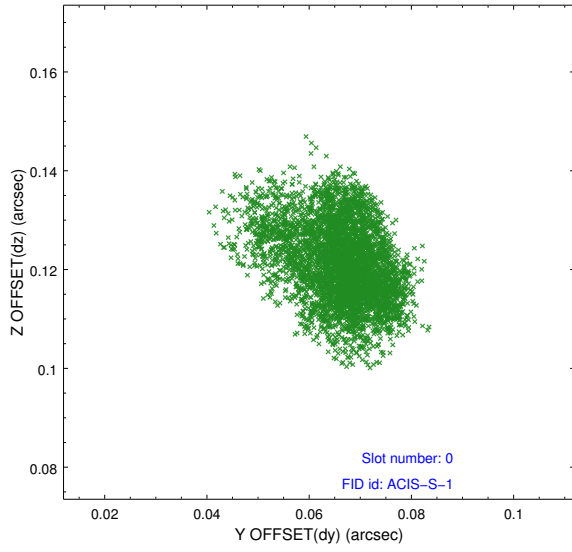


### 2.4.5 Slot 7

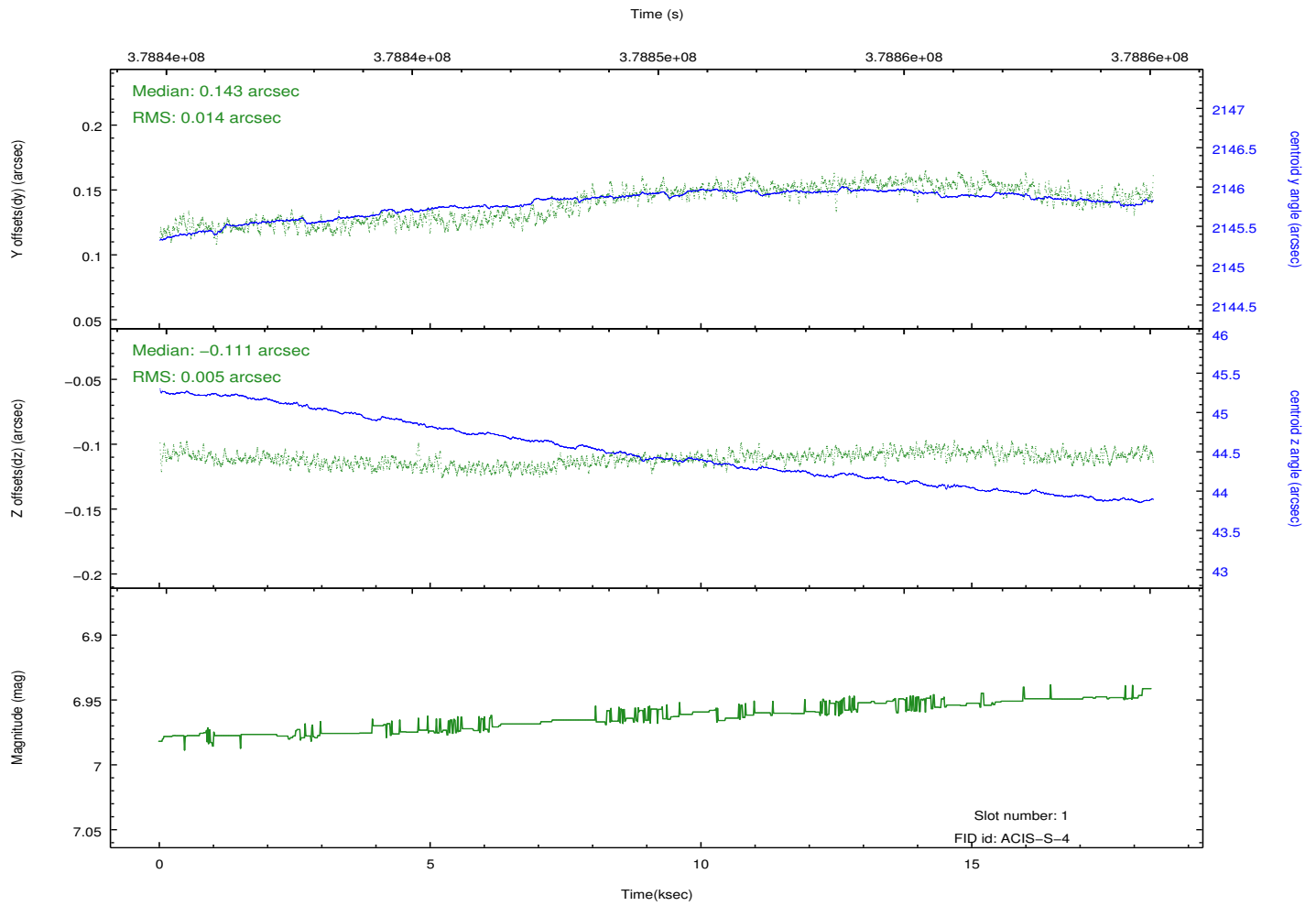
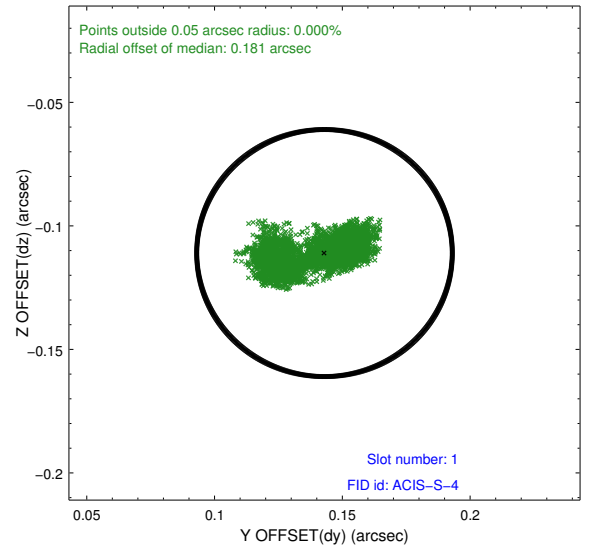
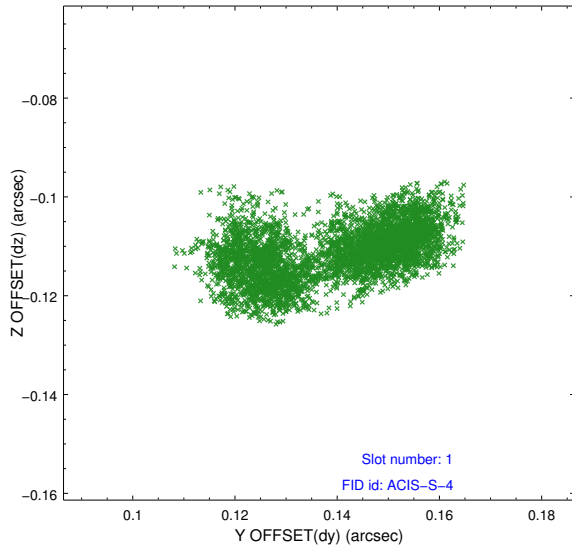


## 2.5 FID Slots

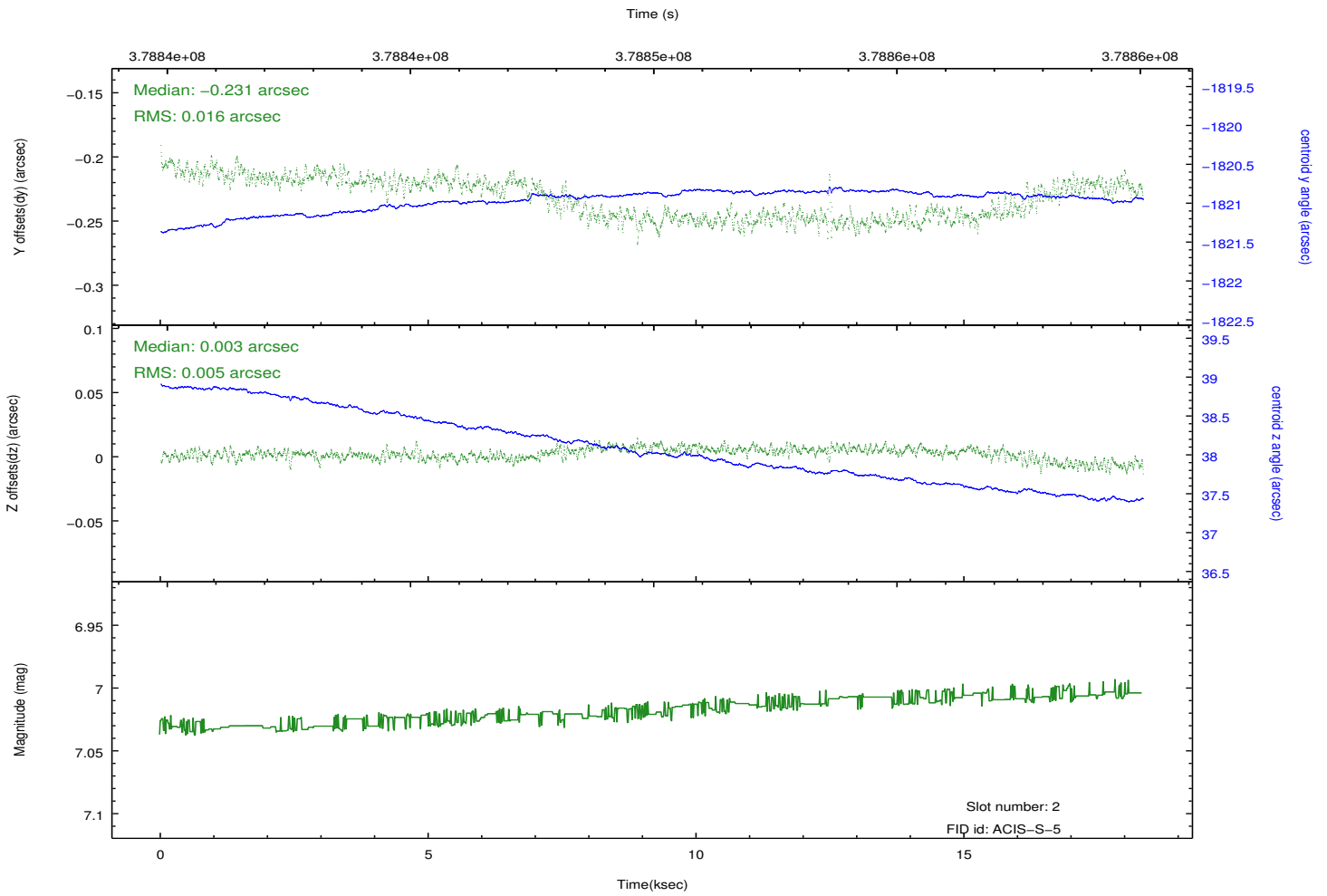
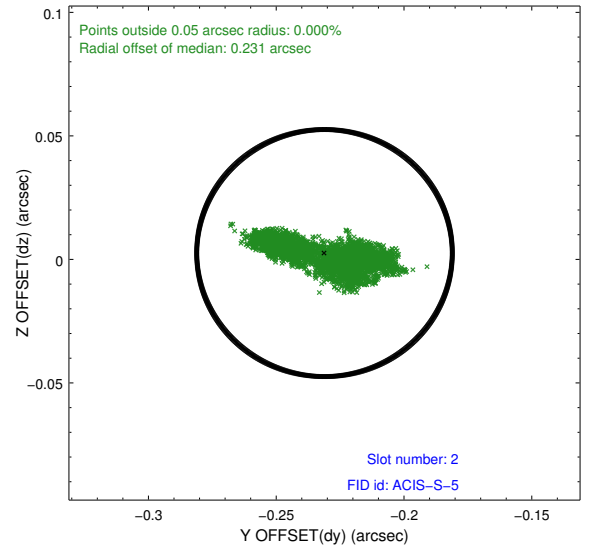
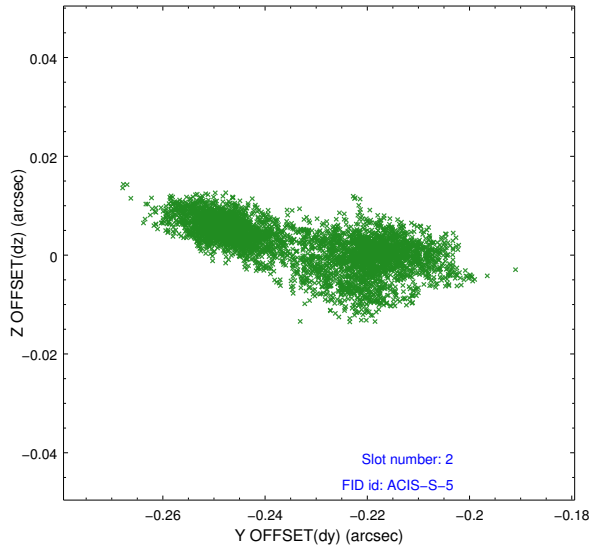
### 2.5.1 Slot 0



## 2.5.2 Slot 1

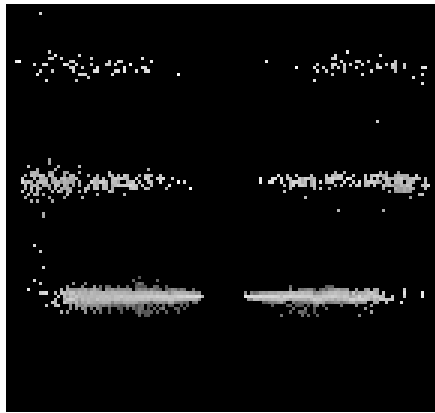


### 2.5.3 Slot 2

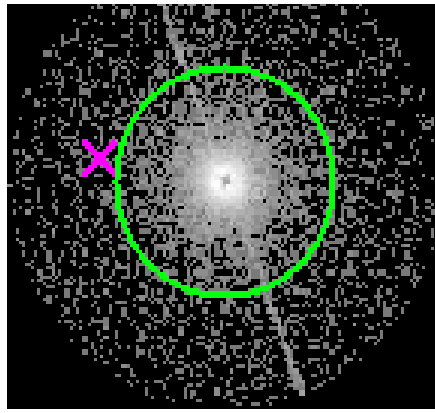


### 3 Gratings

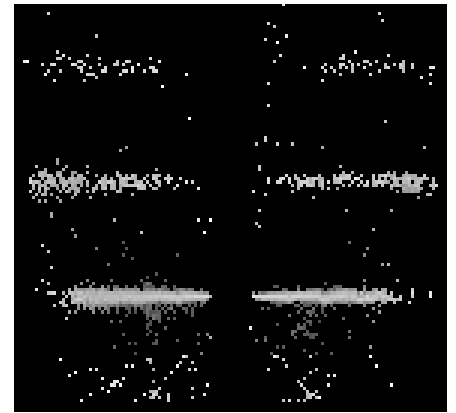
#### 3.1 HEG Arm



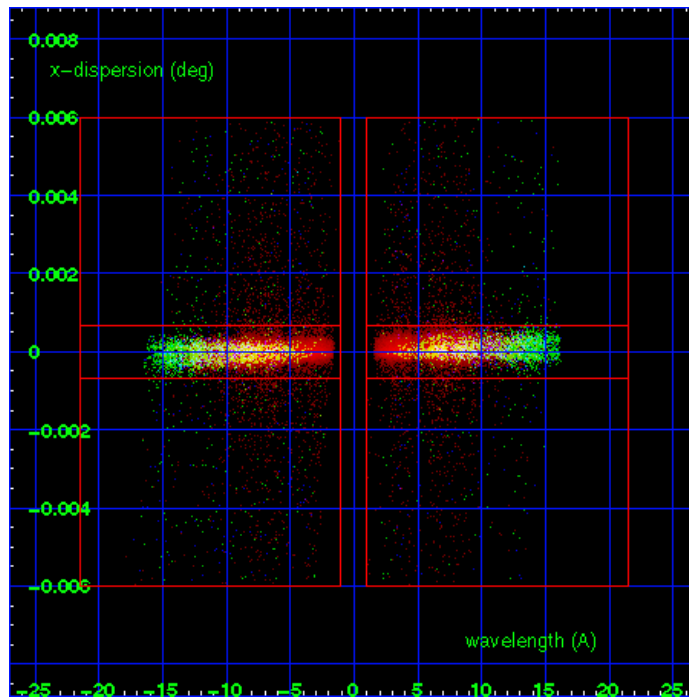
HEG Order Sort 123



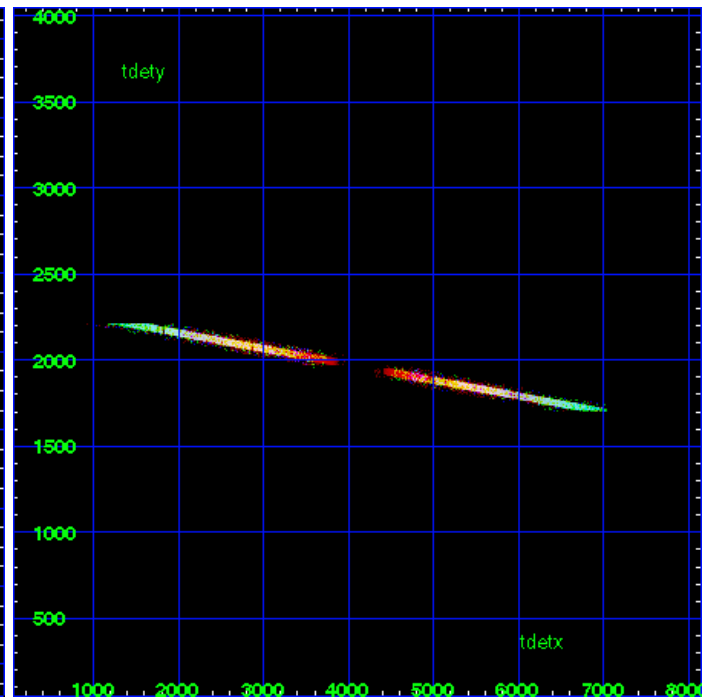
HEG Zero Order



HEG Order Sort ALL

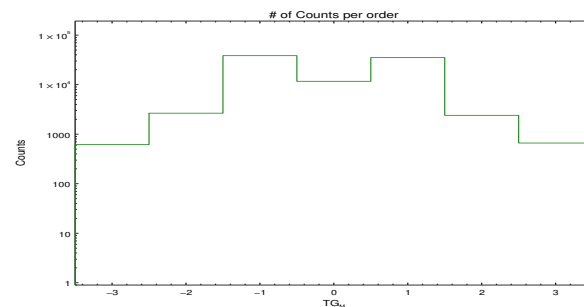


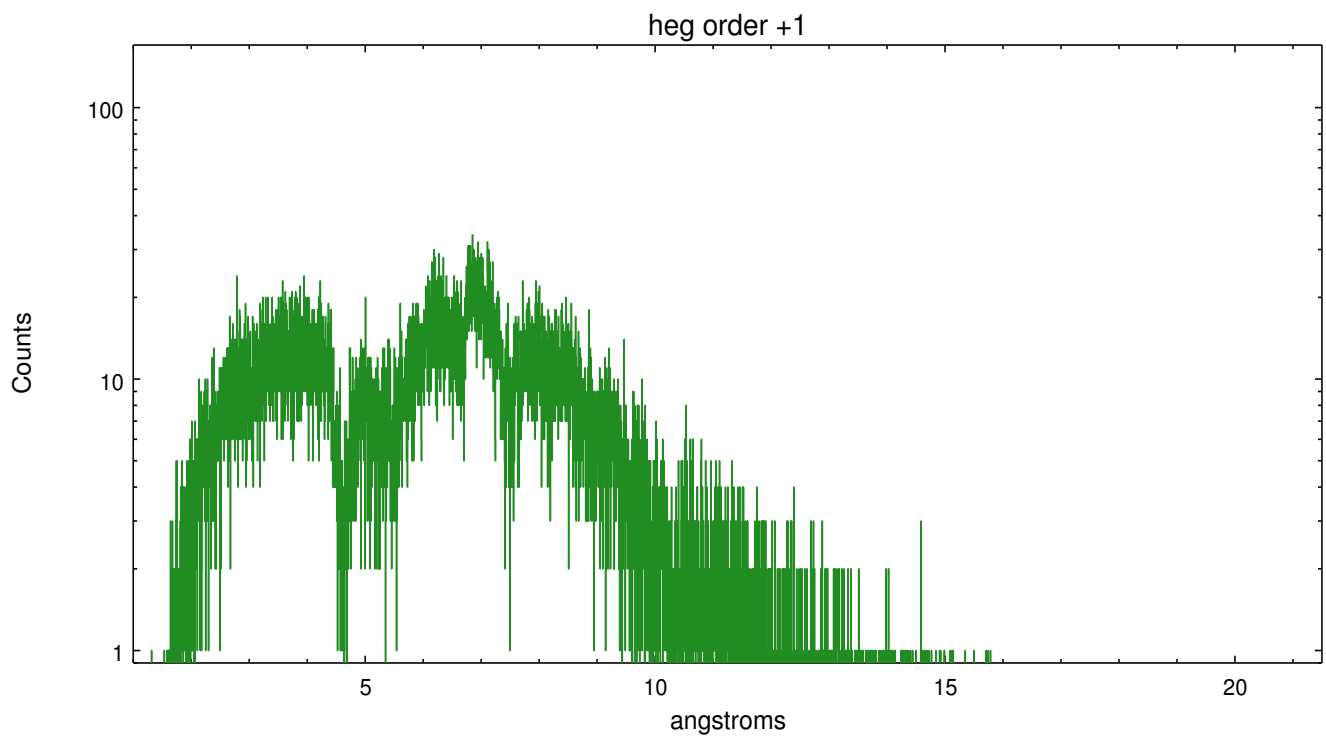
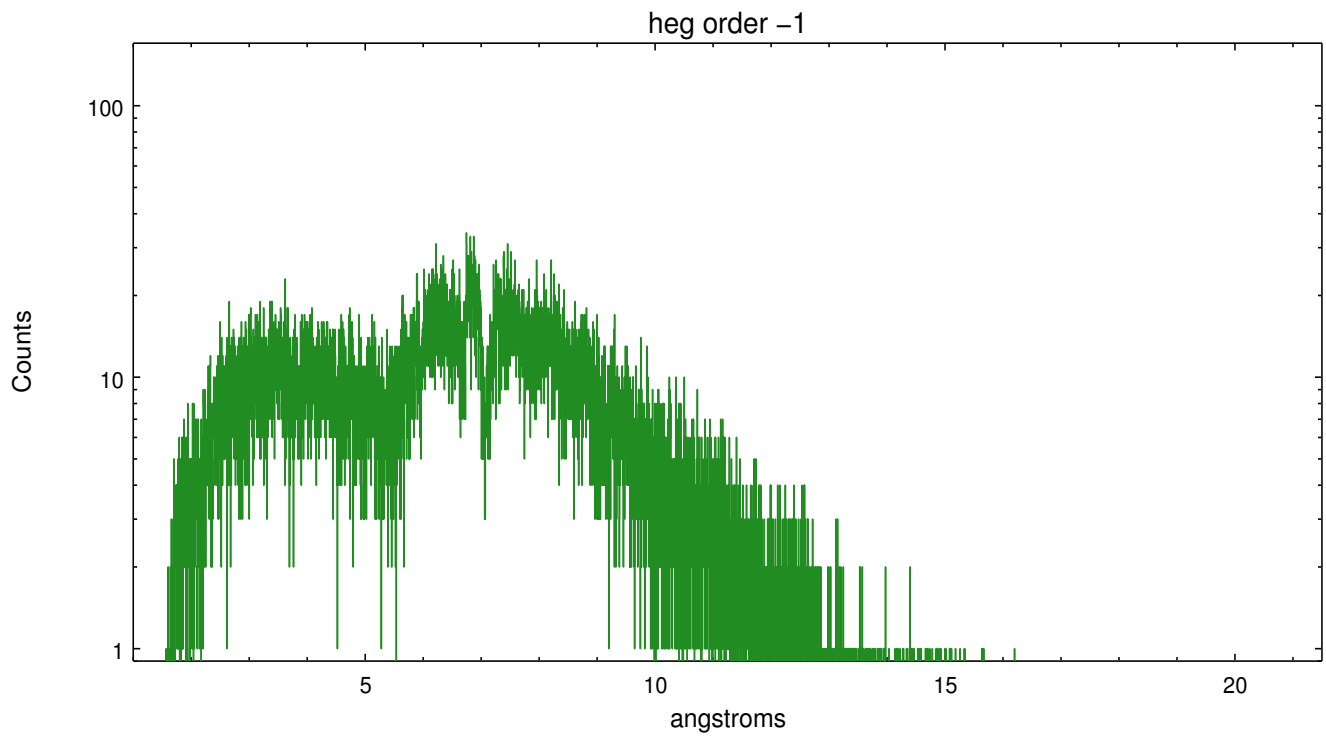
Spot Image HEG



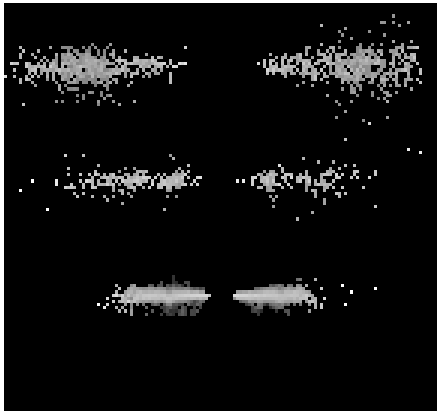
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	616	2655	38509	11694	35161	2404	663

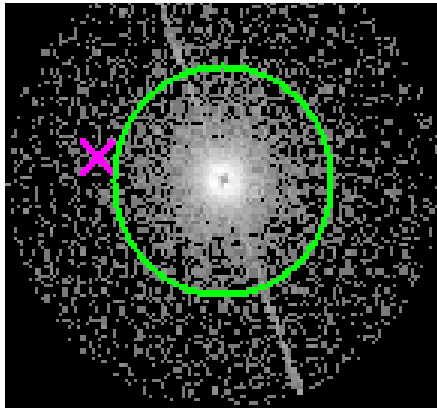




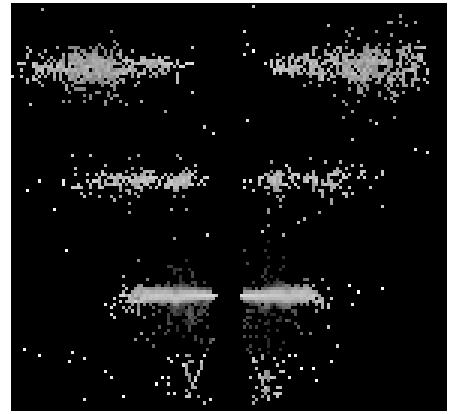
### 3.2 MEG Arm



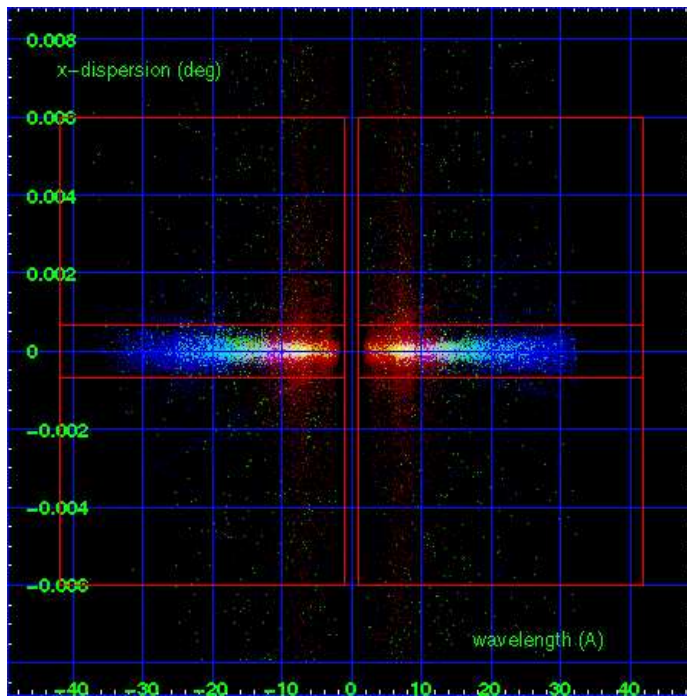
MEG Order Sort 123



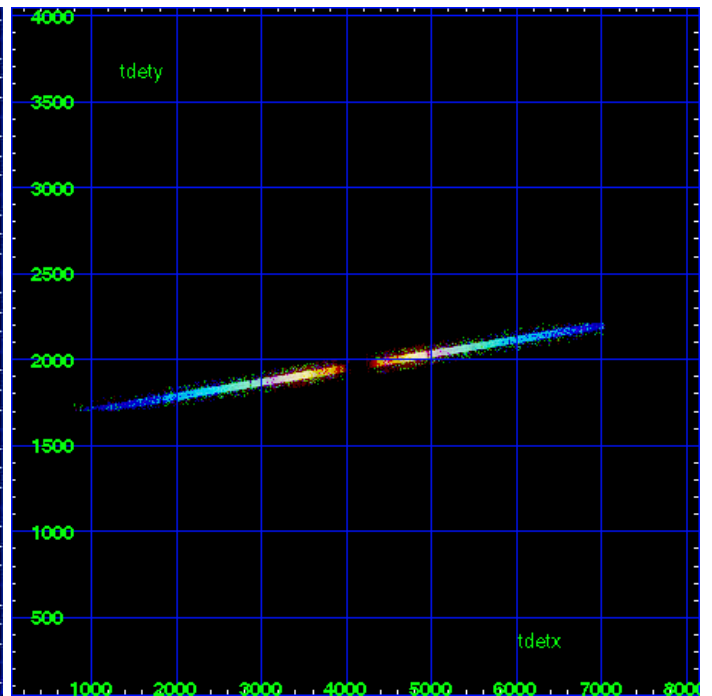
MEG Zero Order



MEG Order Sort ALL

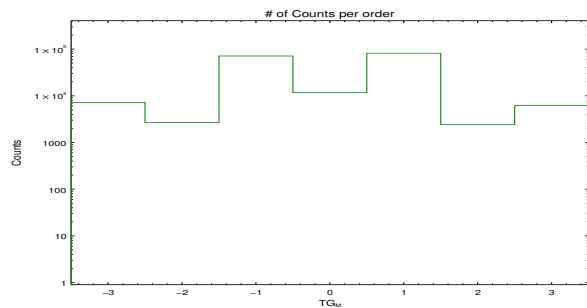


Spot Image MEG

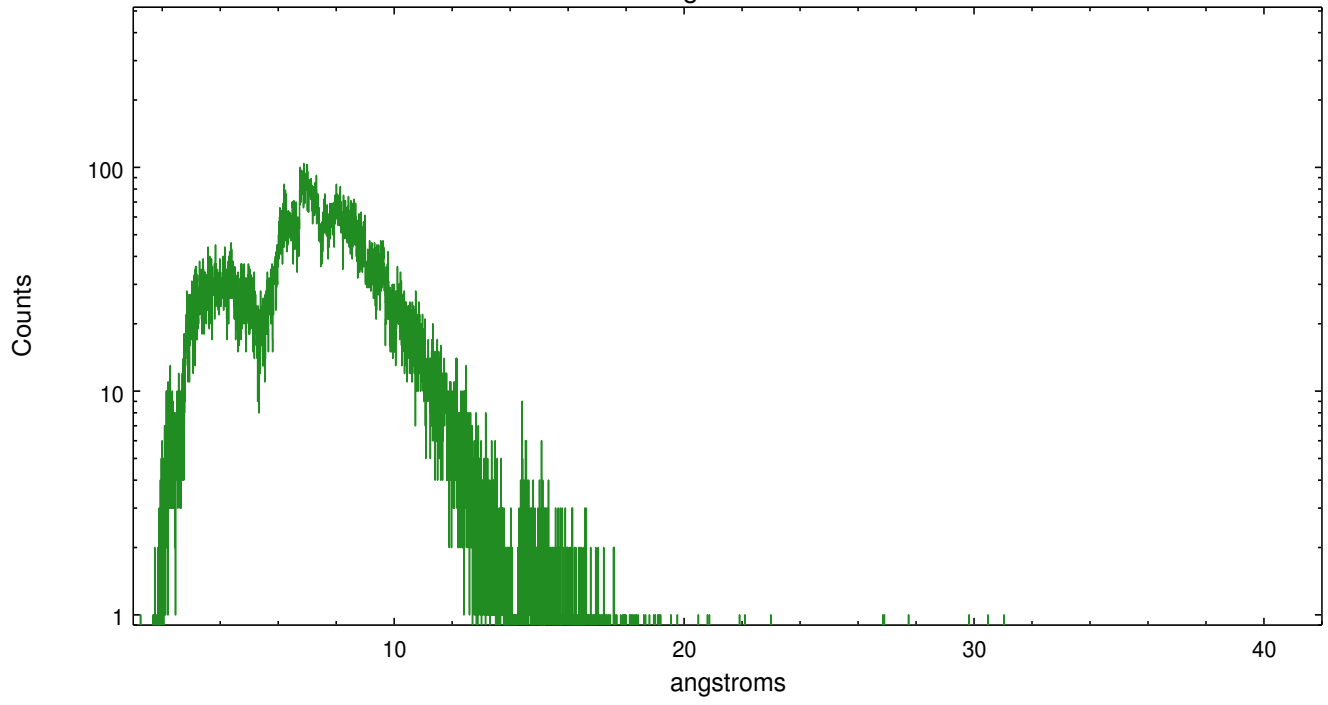


Full Detector MEG

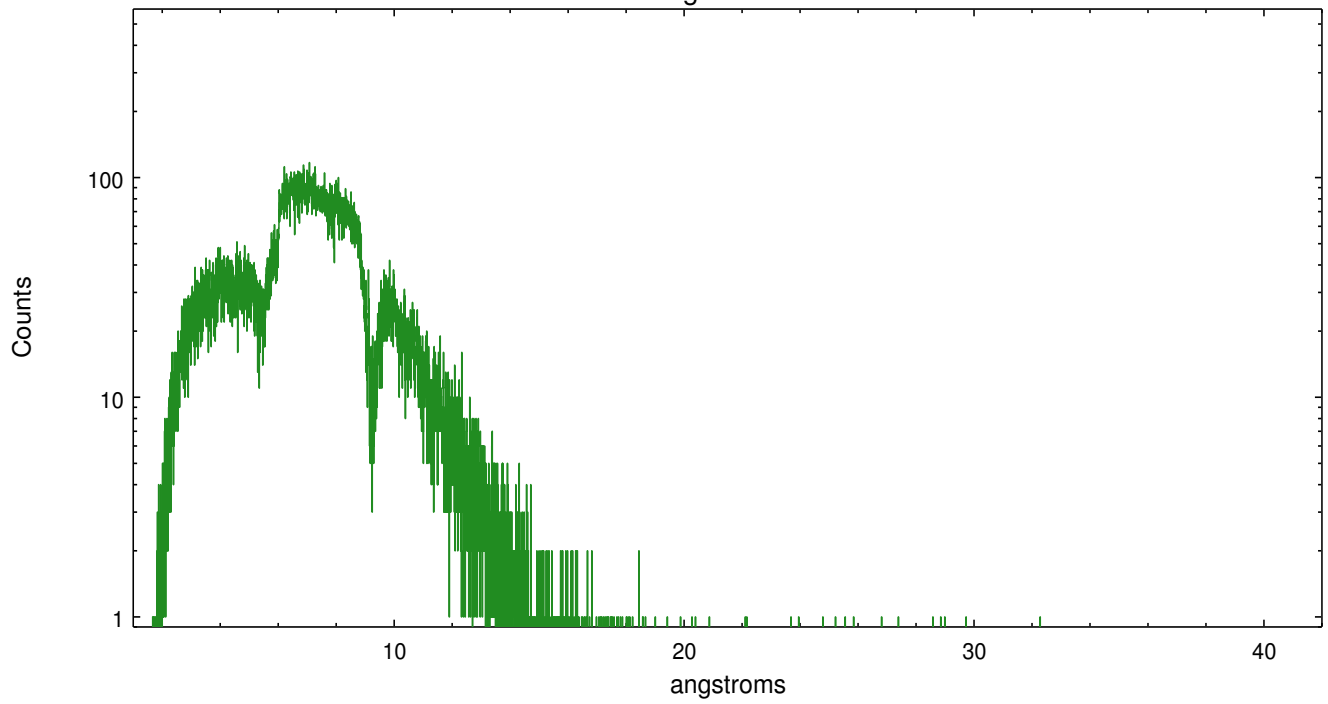
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	7235	2691	71304	11694	81357	2413	6198



meg order -1



meg order +1



# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.06.21
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	17.569499876857

## 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=4130.79, y=4090.11) 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 (currently in ISIS). The tool calculates the point of intersection of the readout streak and the meg arm (preferred position), or the readout streak and the heg 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.