

# V&V Reference Report

## L2 ASCDS Version : 10.8

Observation 22276 - L2 Version 2  
Chandra X-Ray Center

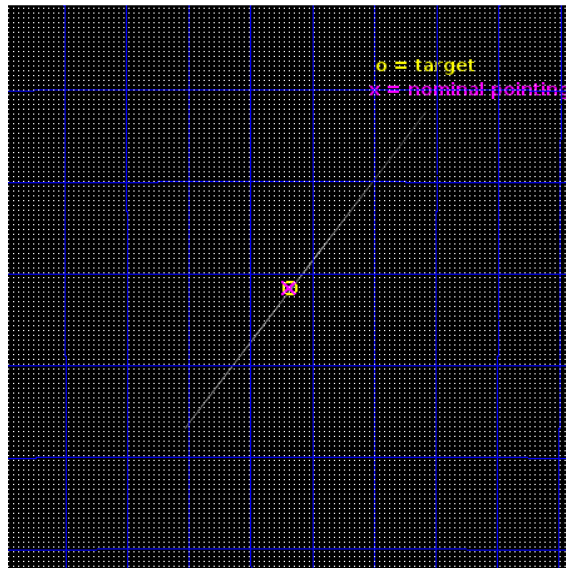
L2 Processing Date : Sep 27 2019

## 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

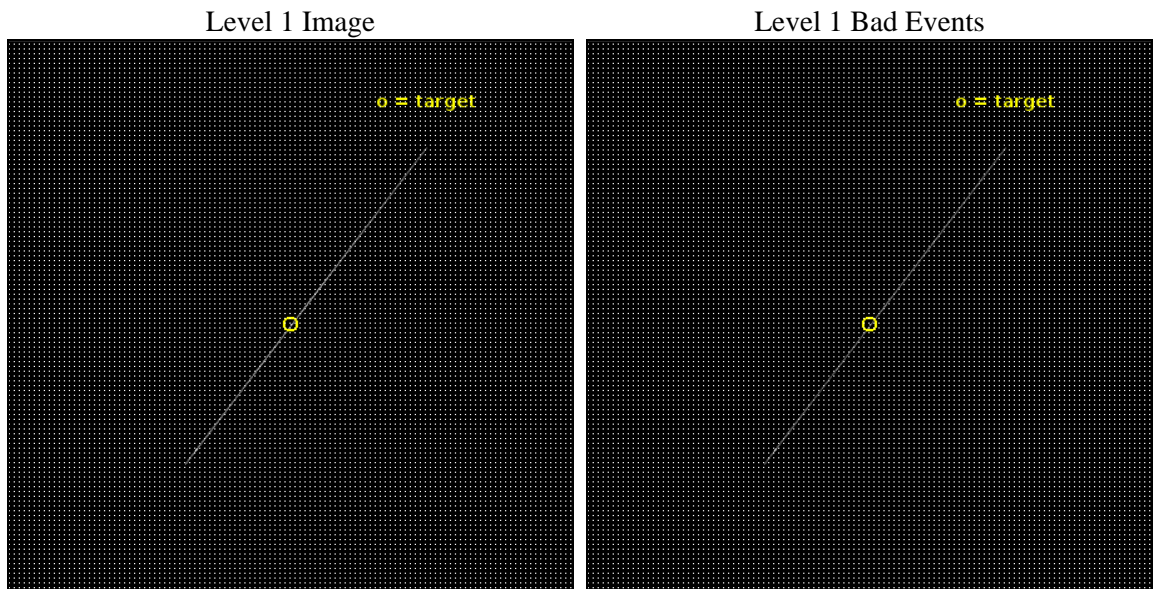
seq_num	402121	Sequence number
obs_id	22276	Observation id
title	HETG Study of Emission & Absorption Lines in X-ray Bursts from 4U 1820-30	Proposal title
observer	Craig Heinke	Principal investigator
object	4U 1820-30	Source name
ra_targ	275.91875	Observer's specified target RA [deg]
dec_targ	-30.361111	Observer's specified target Dec [deg]
ra_nom	275.92103304985	Nominal RA [deg]
dec_nom	-30.359428672883	Nominal Dec [deg]
roll_nom	306.15777897149	Nominal Roll [deg]
revision	2	Processing version of data
ontime	13701.484887838	Sum of GTIs [s]
livetime	13647.963462495	Livetime [s]
ontime5	17361.070565701	Sum of GTIs [s]
ontime6	9538.2801325321	Sum of GTIs [s]
ontime7	13701.484887838	Sum of GTIs [s]
ontime8	10799.004414797	Sum of GTIs [s]
ontime9	11340.498367906	Sum of GTIs [s]
l2events	2062155	Number of level 2 events



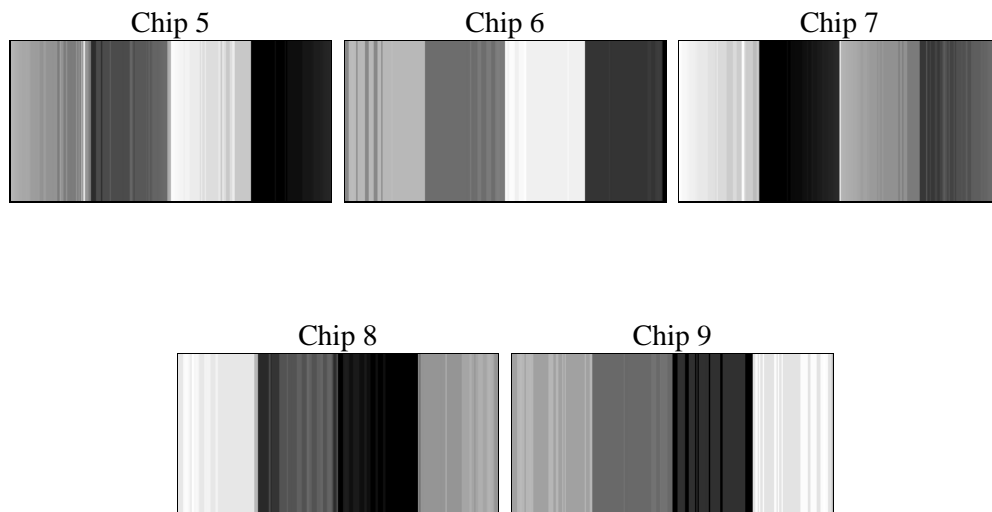
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	25000.000000	[s] Scheduled observation exposure time
ascdsver	10.8	Processing system revision	ontime	13701.484887838	Sum of GTIs [s]
caldsver	4.8.4.1	&#160	ontime5	17361.070565701	Sum of GTIs [s]
date	2019-09-27T21:34:26	Date and time of file creation	ontime6	9538.2801325321	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	13701.484887838	Sum of GTIs [s]
			ontime8	10799.004414797	Sum of GTIs [s]
			ontime9	11340.498367906	Sum of GTIs [s]
			l1events	4466104	Number of level 1 events
			tgmethod	TGDETECT	Method used to create src1a file
			zo_pos	(4110.45, 4083.55)	src1a sky pixel position

### 2.1.4 Events

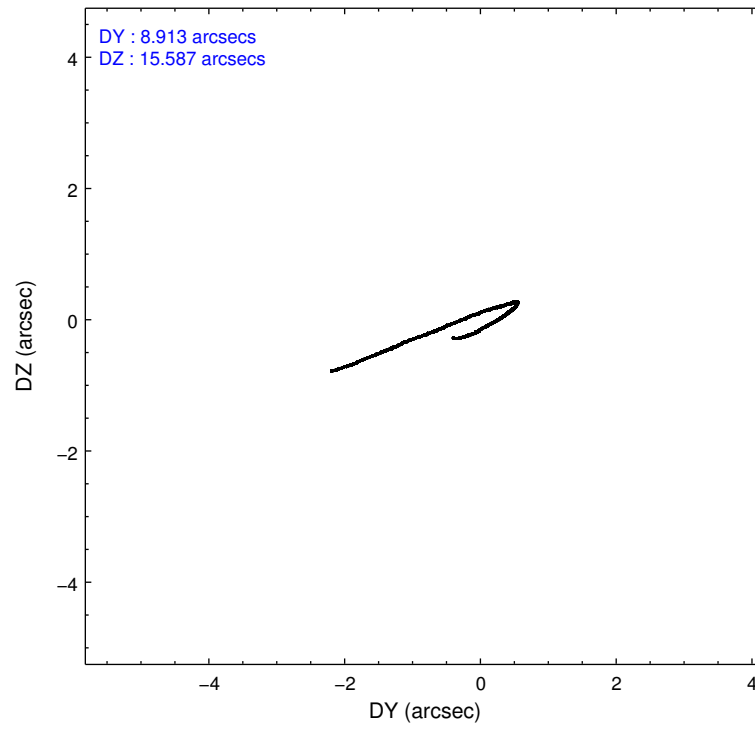
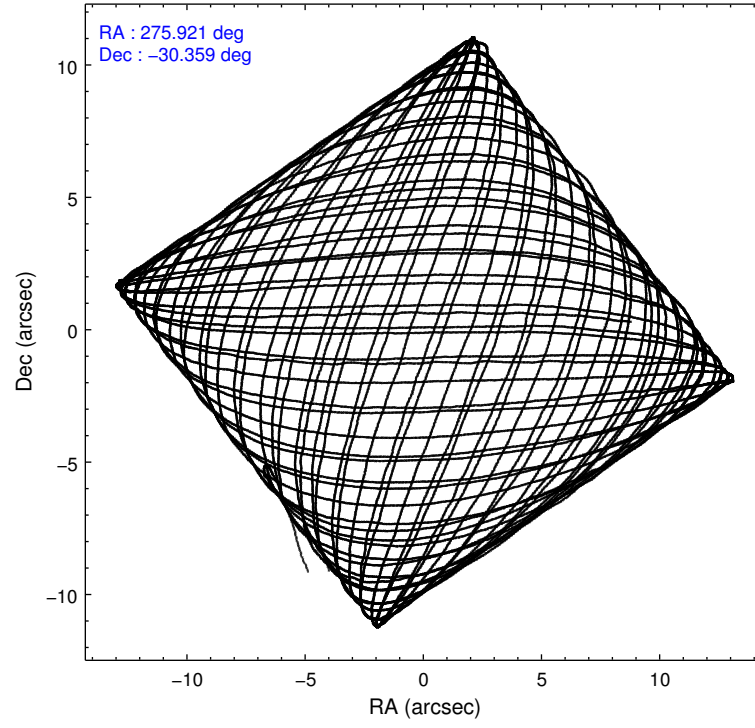
	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9		ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	1491057	575007	1784843	412041	203156	grade 0 events	157288	3844	234880	22705	3638
rejected events	920795	151127	422067	207748	152531		10%	0%	13%	5%	1%
rejected %	61%	26%	23%	50%	75%	grade 1 events	579	82	17603	198	74
							0%	0%	0%	0%	0%
						grade 2 events	292597	375189	421448	152972	36391
							19%	65%	23%	37%	17%
						grade 3 events	7094	1719	113591	4753	1848
							0%	0%	6%	1%	0%
						grade 4 events	6774	1603	113073	4486	1954
							0%	0%	6%	1%	0%
						grade 5 events	18090	5613	84544	7411	5202
							1%	0%	4%	1%	2%
						grade 6 events	106551	41548	480015	19382	6801
							7%	7%	26%	4%	3%
						grade 7 events	902084	145409	319689	200134	147248
							60%	25%	17%	48%	72%

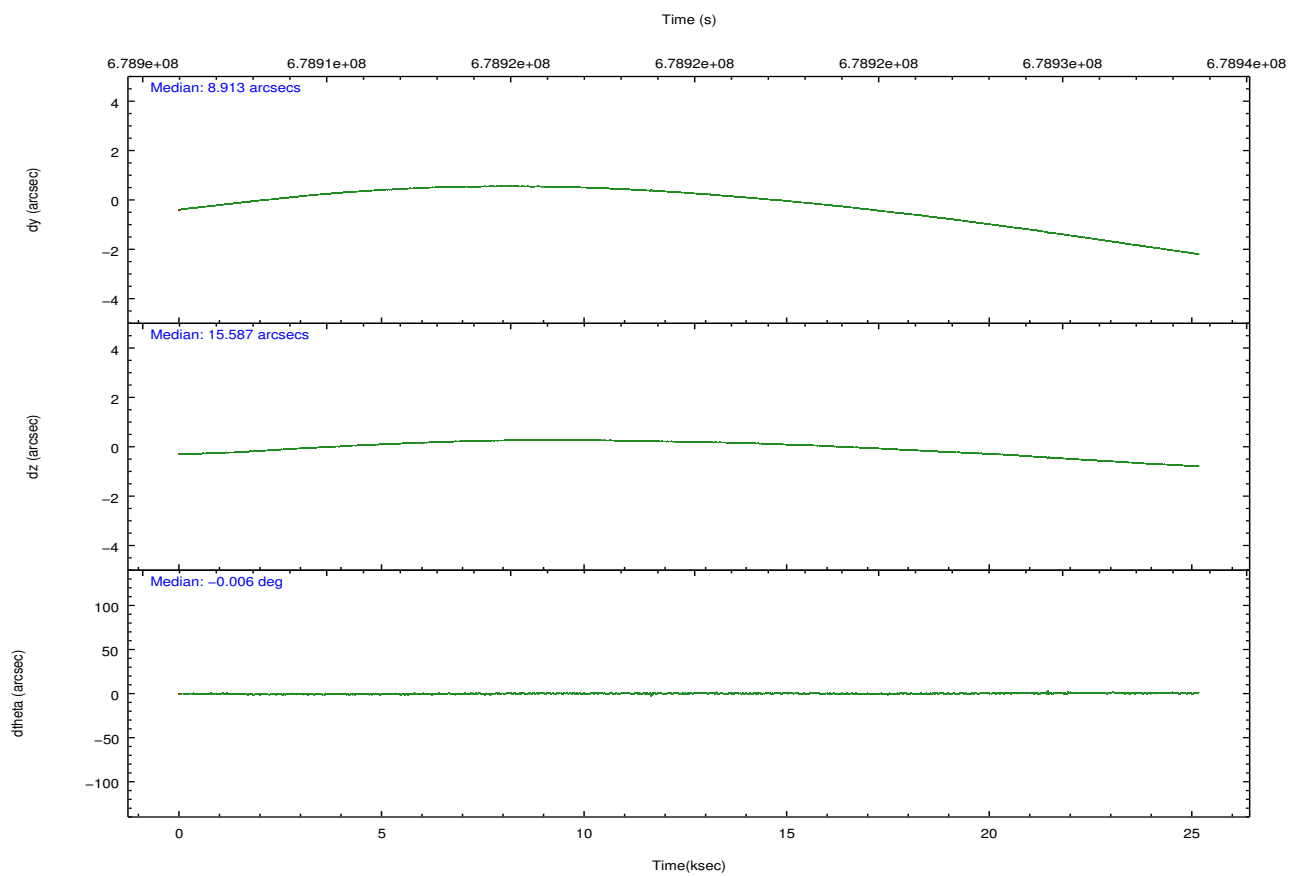
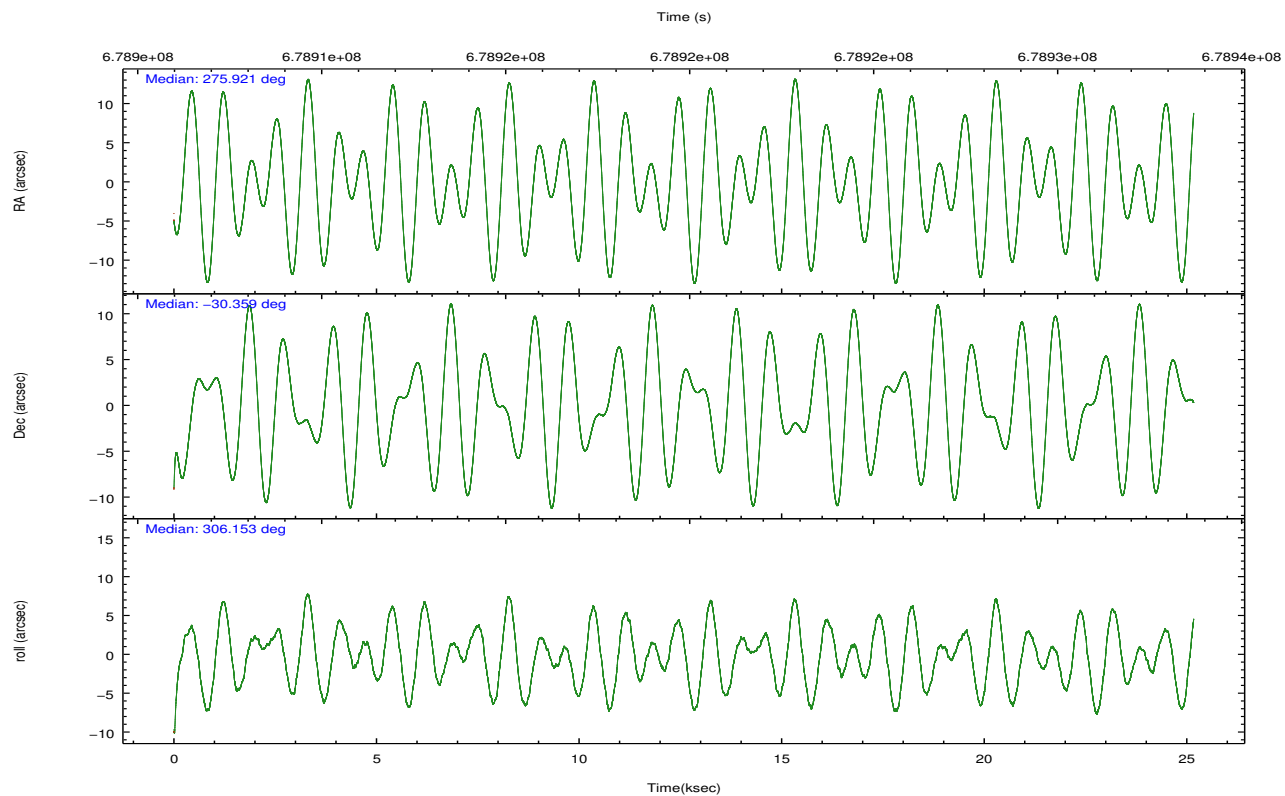
## 2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-56789	ACIS-56789
Grating	HETG	HETG
Data mode	CC33_FAINT	CC33_FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	275.891786	275.9210330498455
[deg] Pointing Dec	-30.348658	-30.35942867288312
[deg] Pointing Roll	305.986375	306.157778971492
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1425803651734
[mm] SIM translation stage offset	0	0.01005778216563158
[s] Observation start time (MET)	678907407.184000	678906431.40786
Observation start date	2019-07-07T17:22:18	2019-07-07T17:07:11
[s] Observation end time (MET)	678932407.184000	678933341.2469701
Observation end date	2019-07-08T00:18:58	2019-07-08T00:35:41
Read mode	CONTINUOUS	CONTINUOUS

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	N	N
CCD I3 on	N	N
CCD S0 on	O1	N
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	O2	Y
Number of optional ACIS chips dropped	1	1
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	0

## 2.3 Aspect



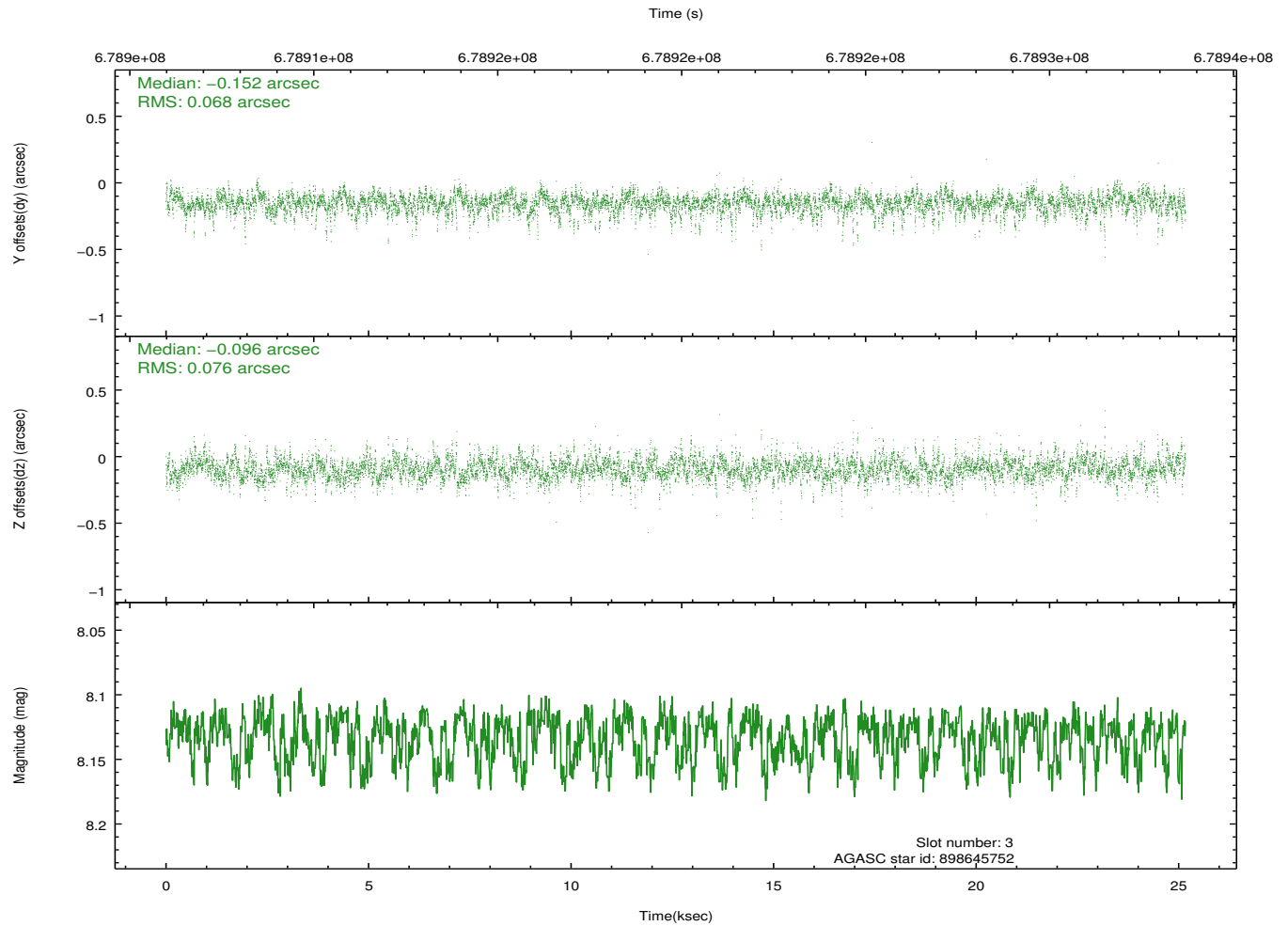
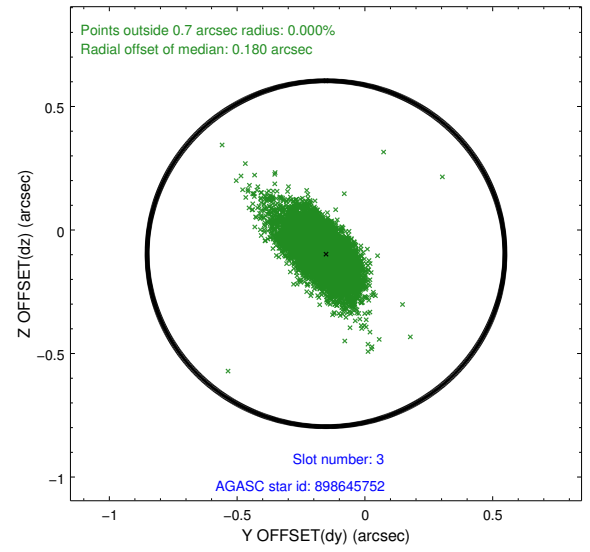
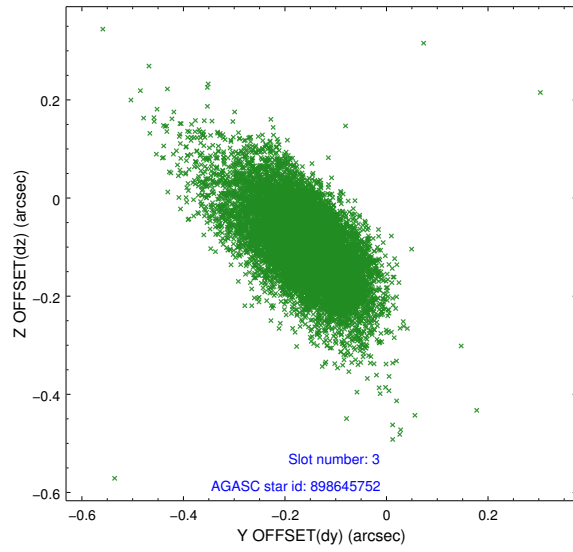


Slot Statistics

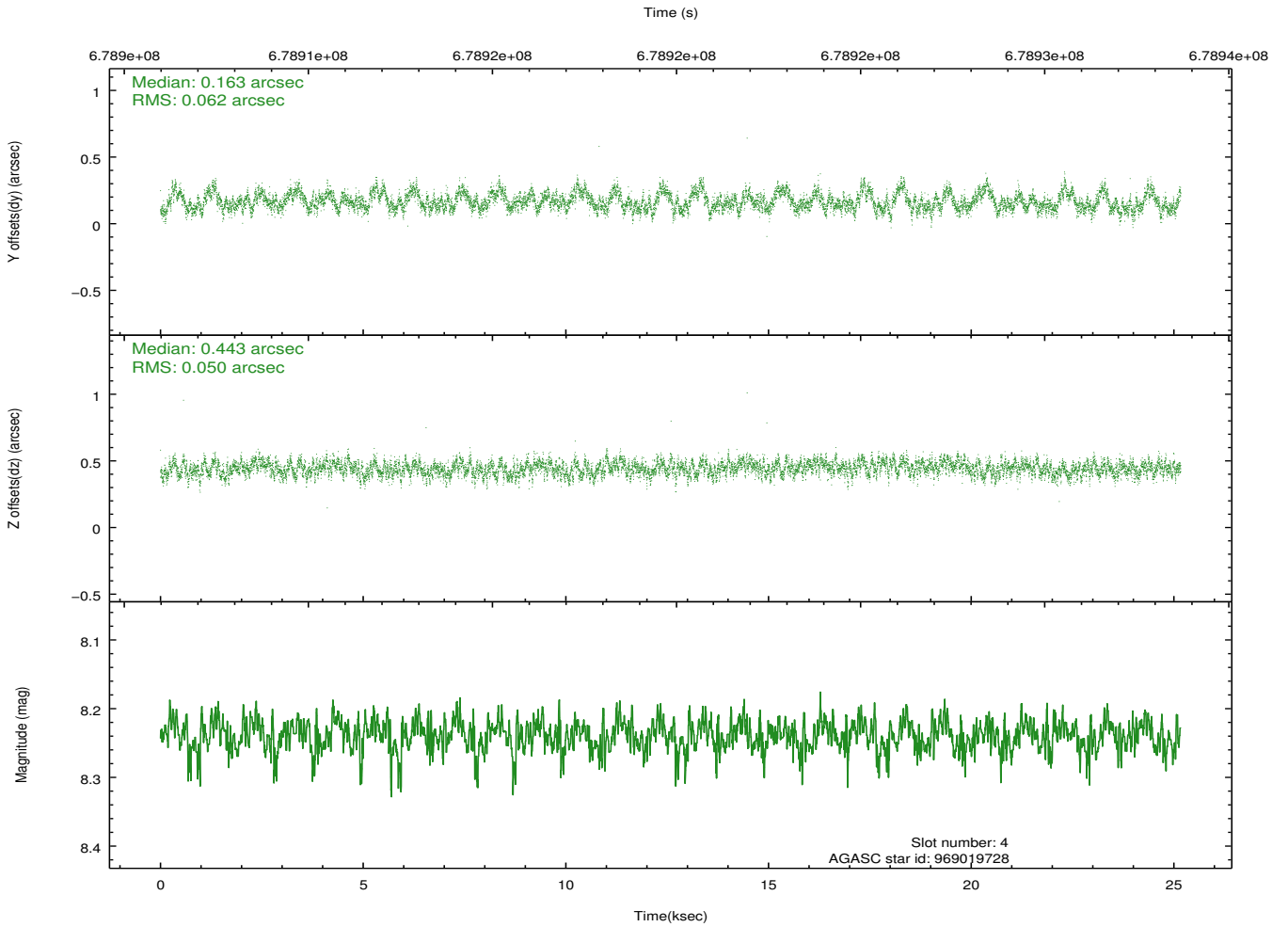
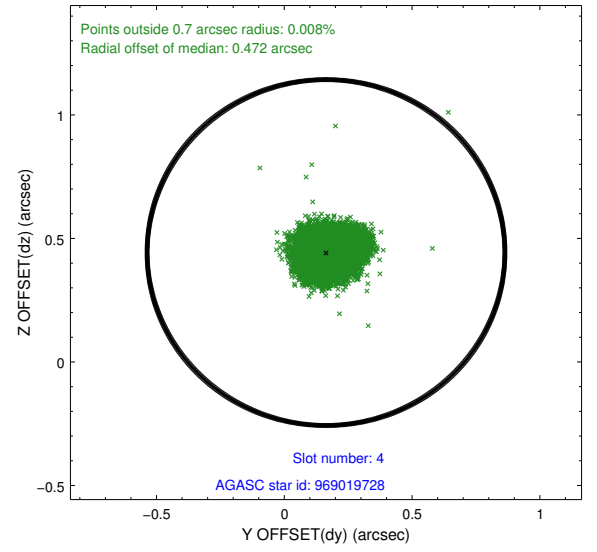
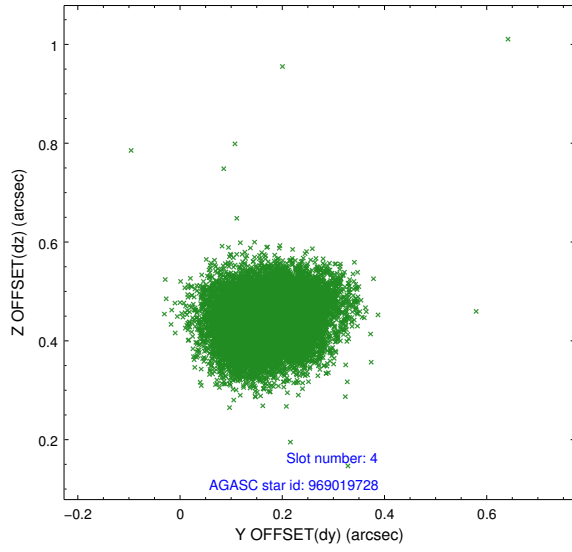
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-3	7.38	6140	1.000	-0.229	-0.238	0.017	0.028	0.000000	0.000000	51.57	-1866
1	FID		ACIS-S-4	7.25	6140	1.000	0.645	0.232	0.017	0.068	0.000000	0.000000	2152.53	171
2	FID		ACIS-S-5	7.21	6139	1.000	-0.442	0.015	0.027	0.066	0.000000	0.000000	-1814.58	165
3	GUIDE	used	898645752	8.13	12270	1.000	-0.152	-0.096	0.098	0.190	276.110680	-29.531880	-1972.97	2280
4	GUIDE	used	969019728	8.24	12268	1.000	0.163	0.443	0.084	0.134	275.177360	-30.122339	-1960.48	-1324
5	GUIDE	used	969026168	6.88	12278	1.000	-0.370	-0.558	0.093	0.153	276.670048	-30.393325	1557.46	1855
6	GUIDE	used	969019560	8.08	12276	1.000	0.286	0.110	0.117	0.177	275.384365	-30.637201	-79.06	-1884
7	GUIDE	used	898634912	8.36	12269	1.000	0.069	0.110	0.091	0.143	275.480072	-29.835888	-2246.60	42

## 2.4 Star Slots

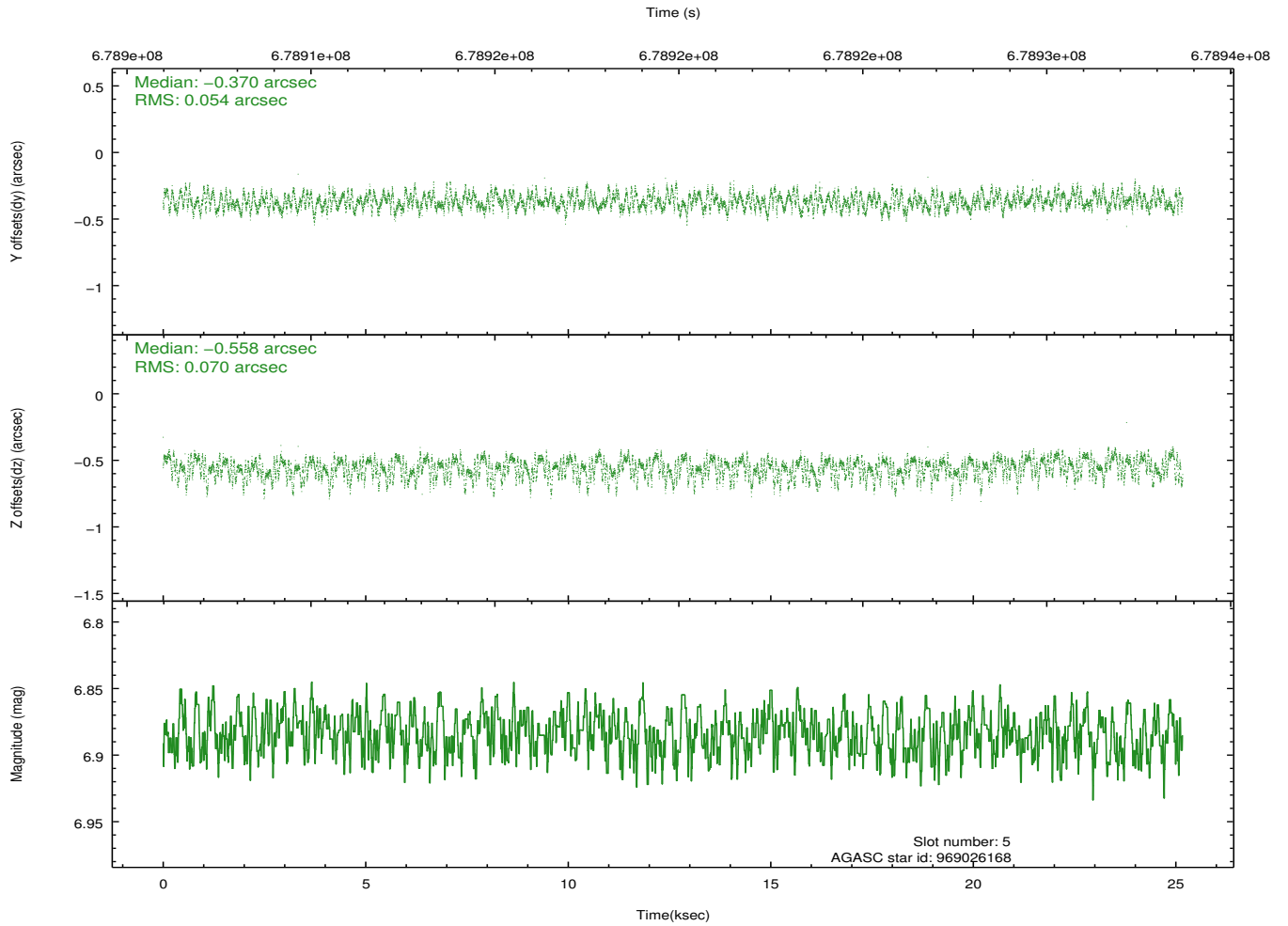
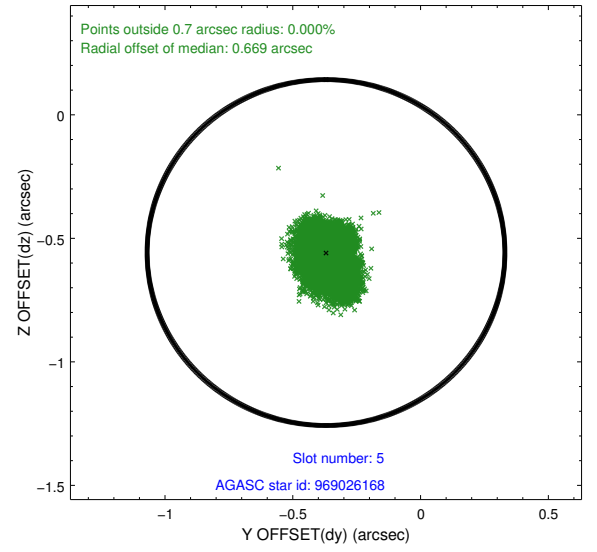
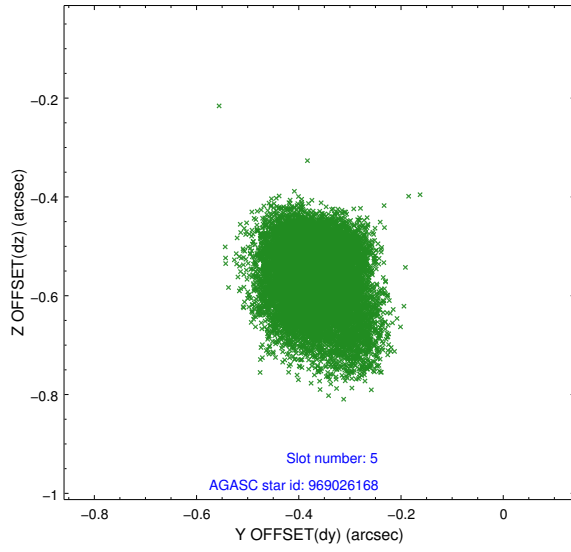
### 2.4.1 Slot 3



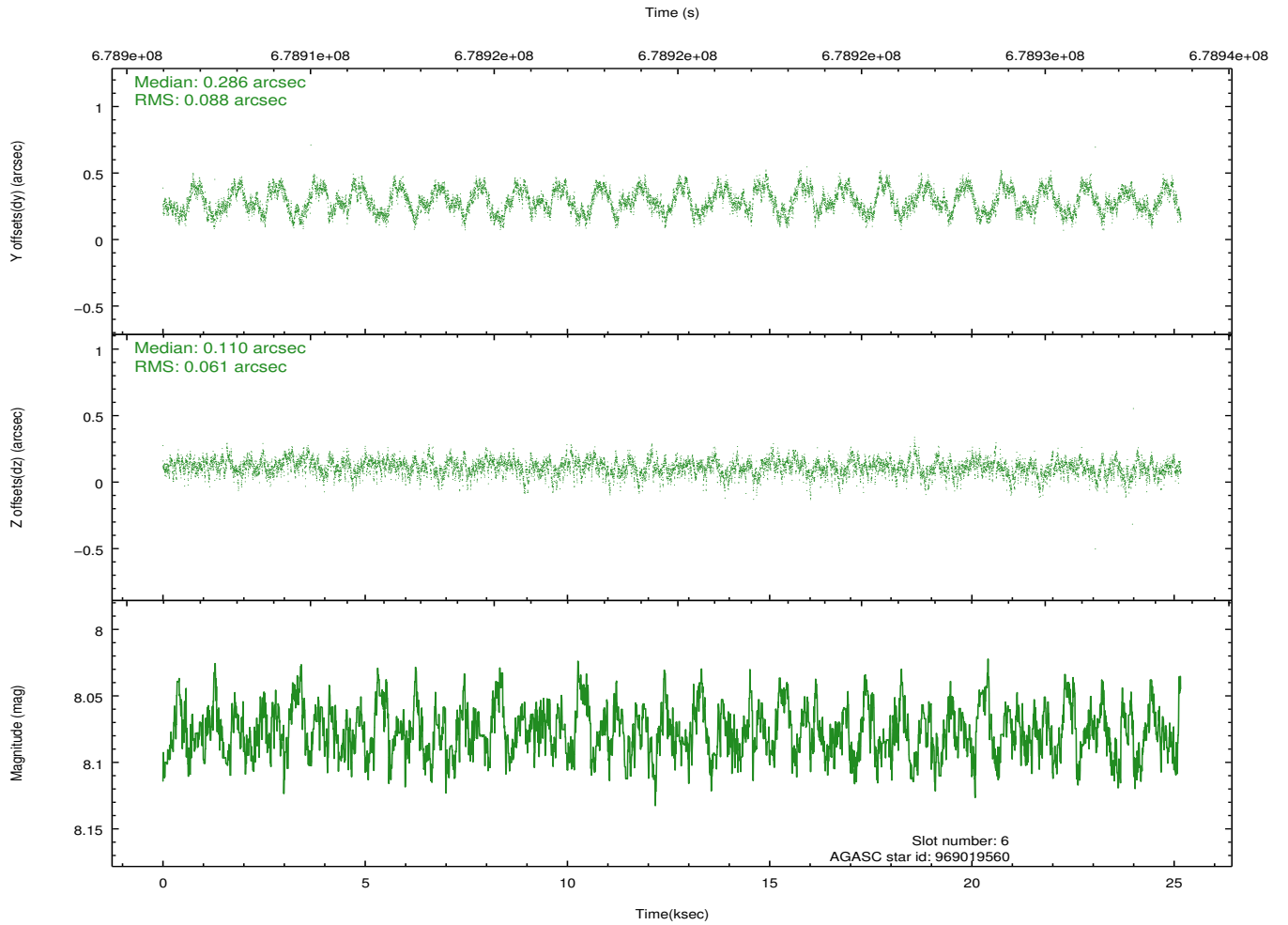
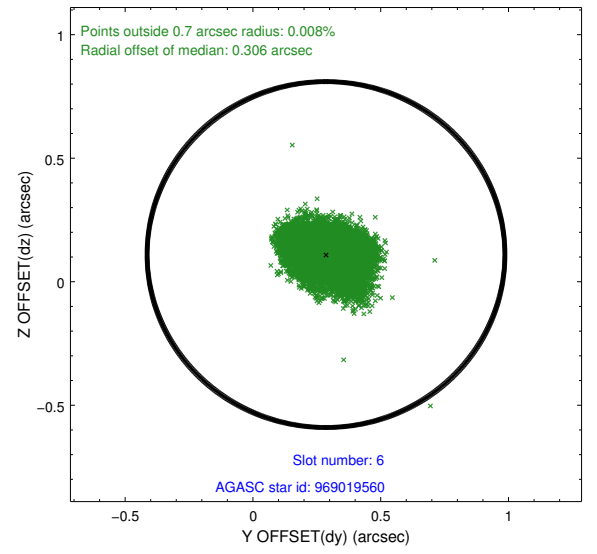
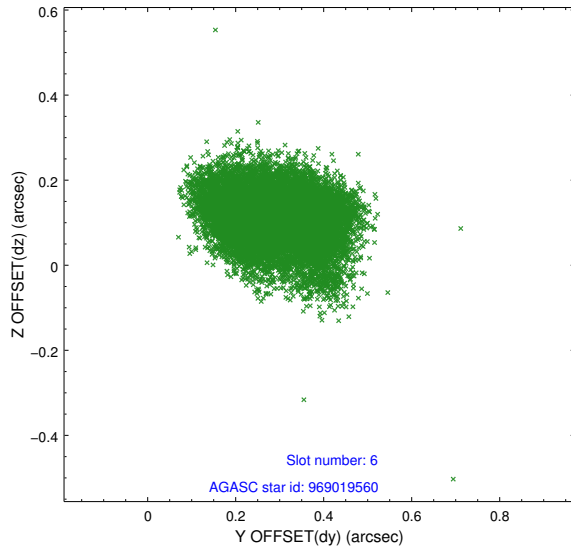
## 2.4.2 Slot 4



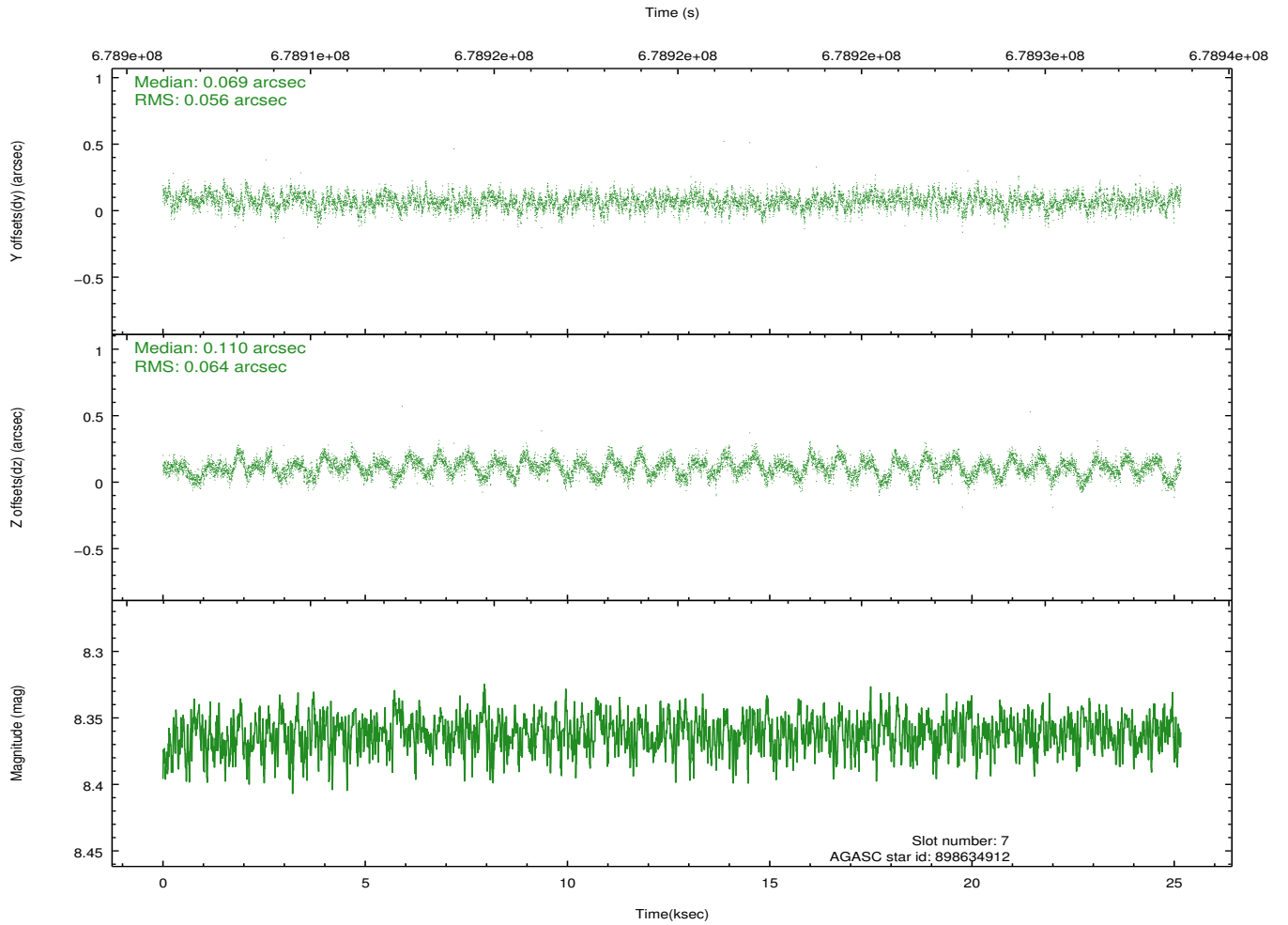
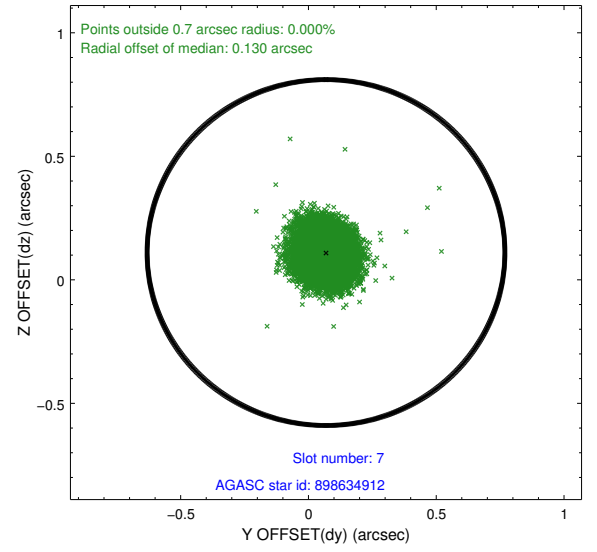
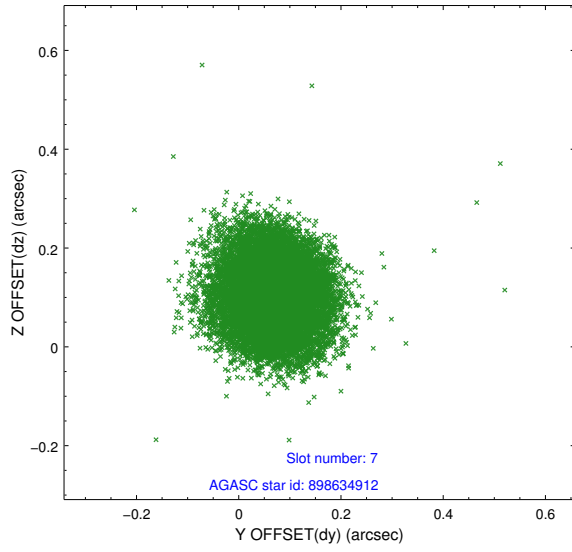
### 2.4.3 Slot 5



## 2.4.4 Slot 6

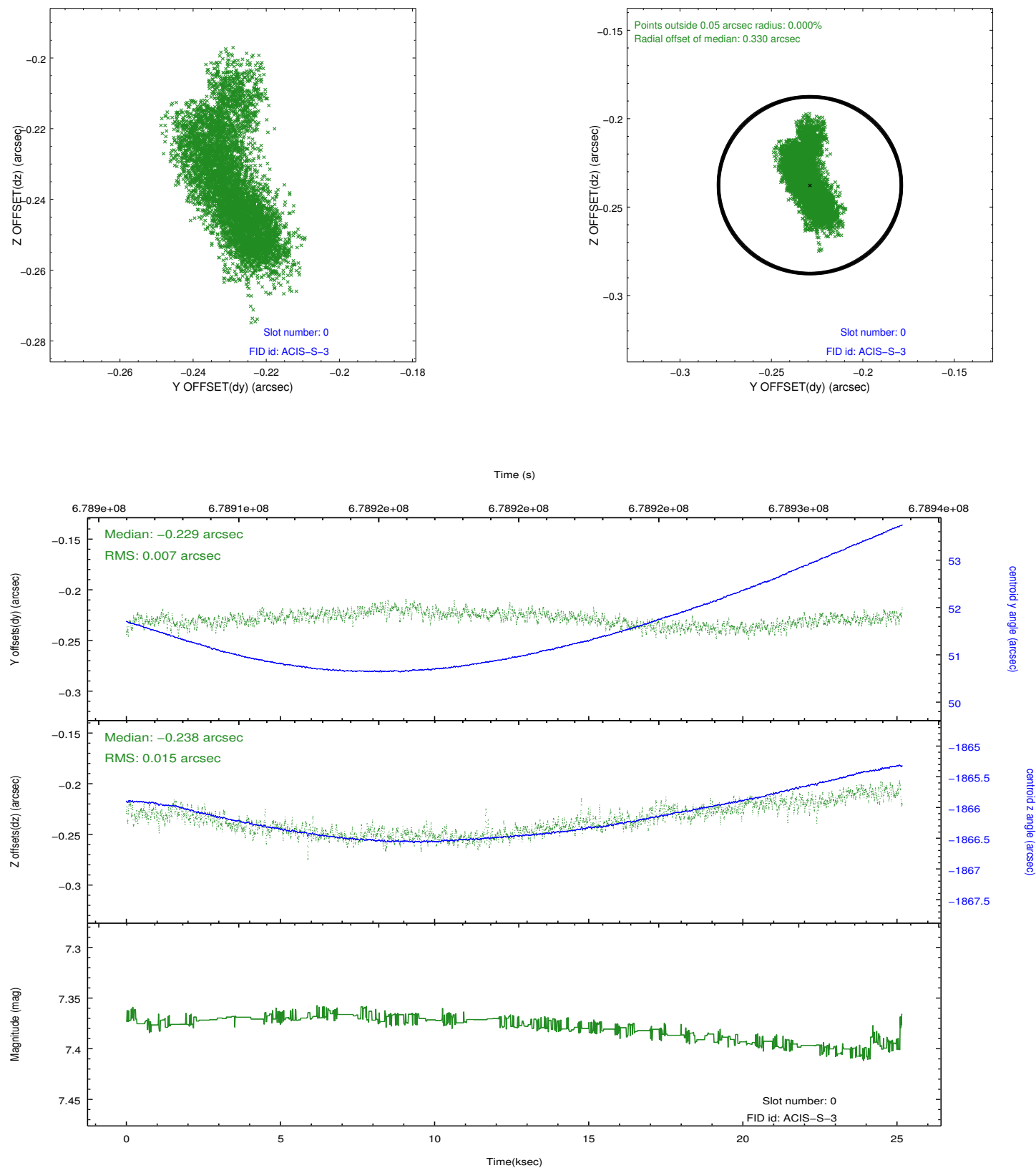


## 2.4.5 Slot 7

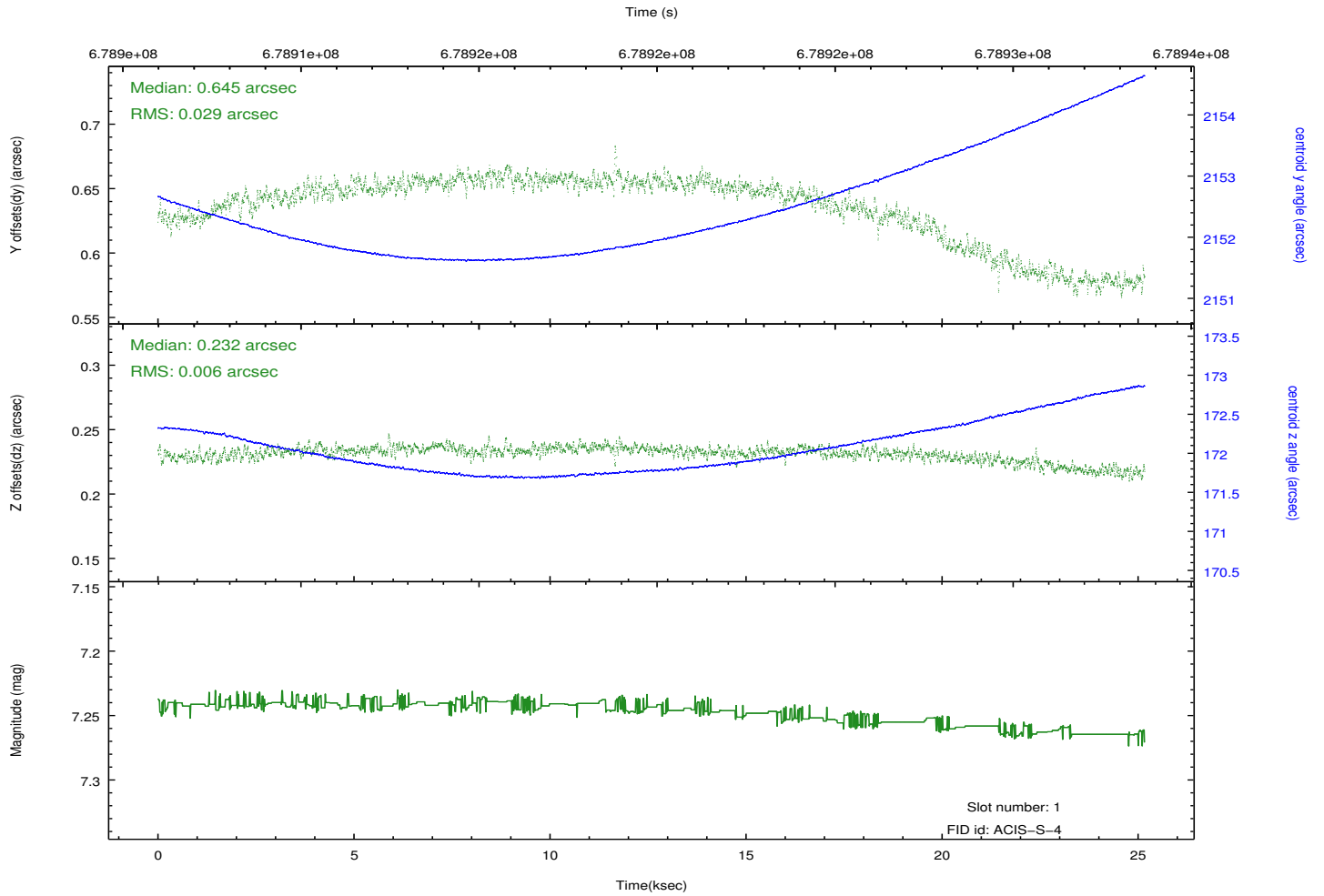
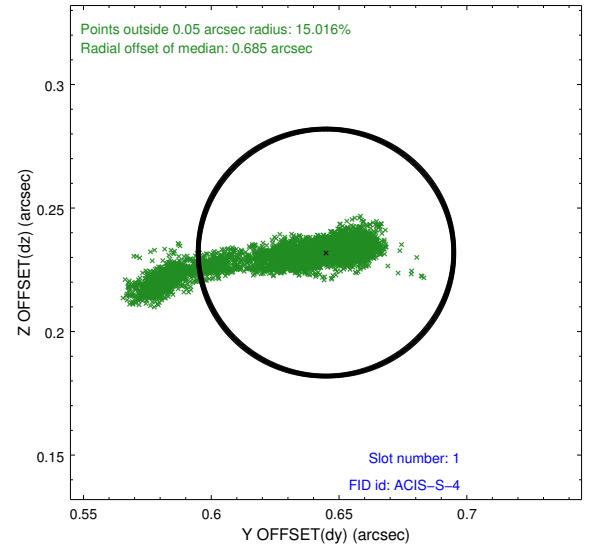
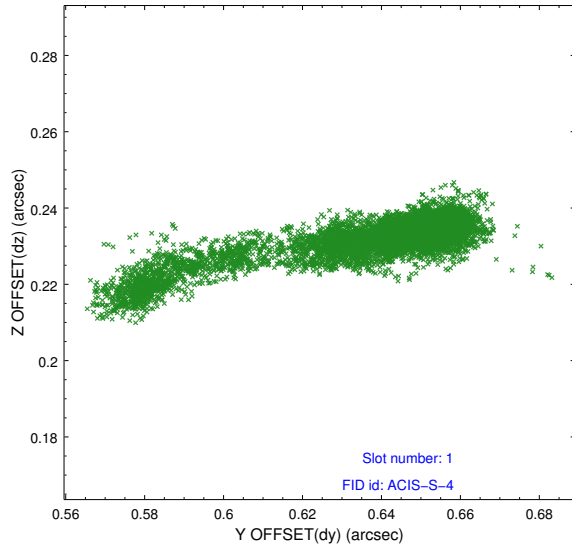


## 2.5 FID Slots

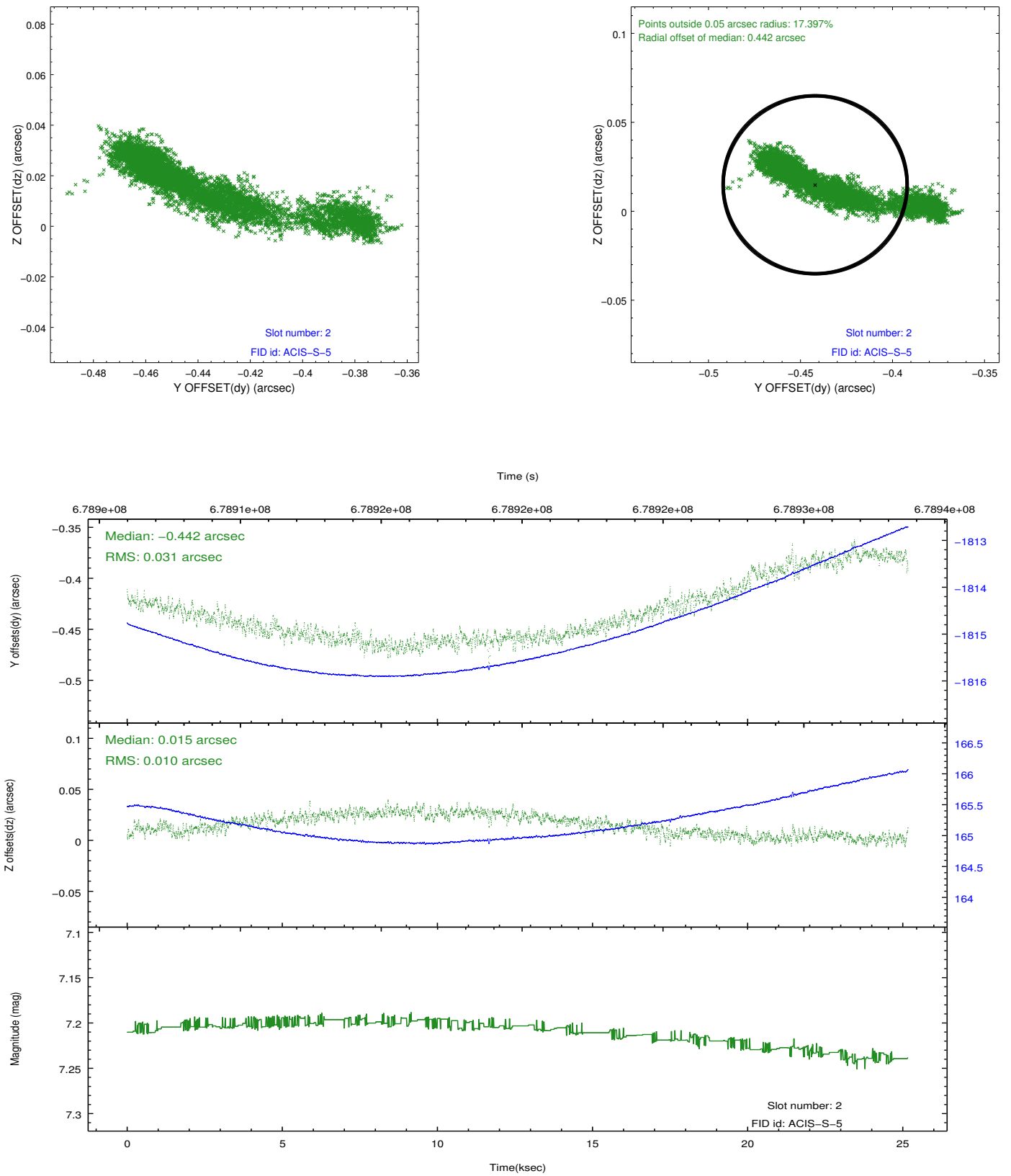
### 2.5.1 Slot 0



## 2.5.2 Slot 1

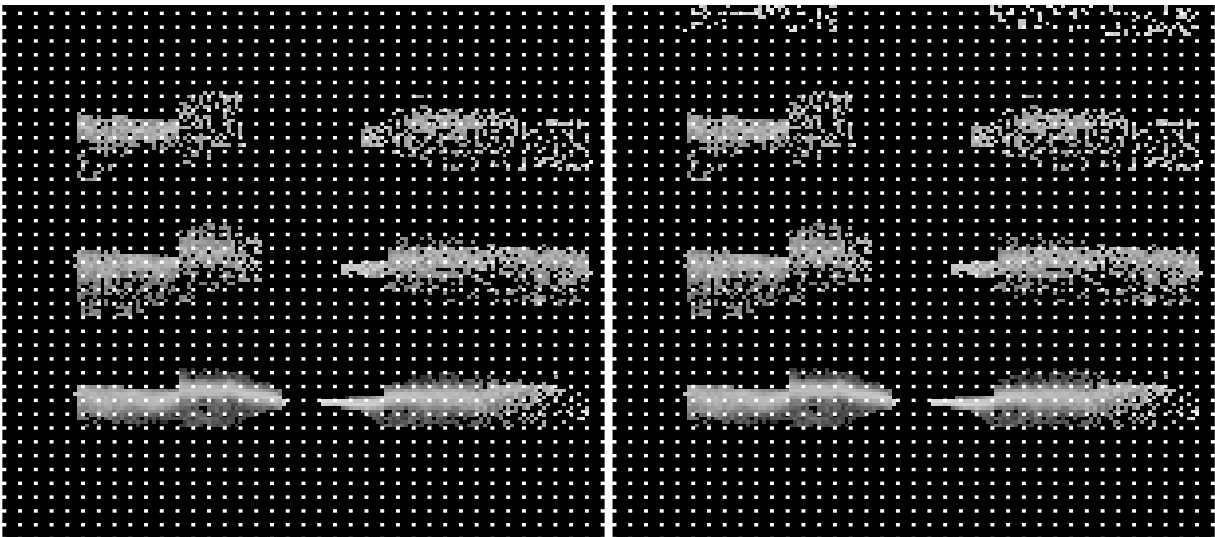


### 2.5.3 Slot 2



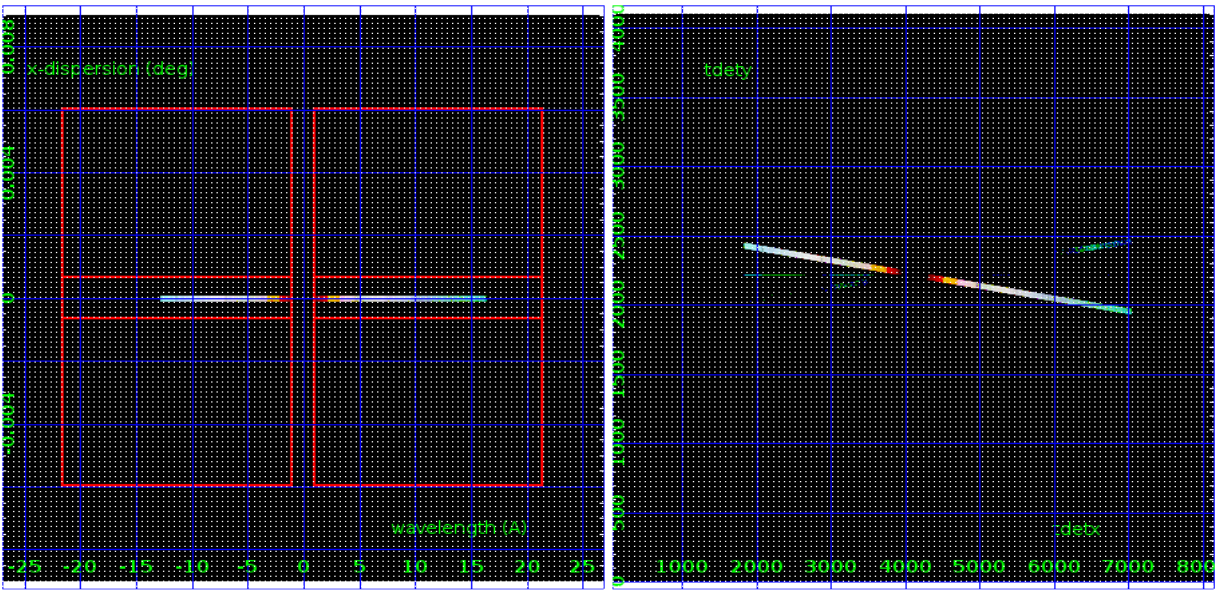
# 3 Gratings

## 3.1 HEG Arm



HEG Order Sort 123

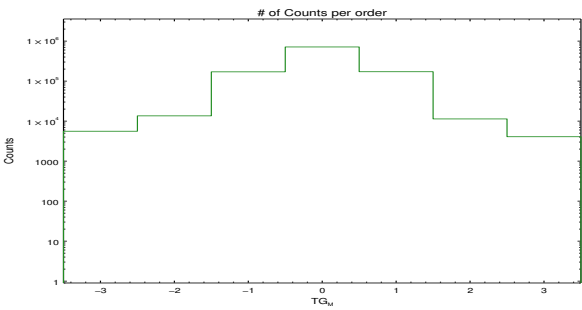
HEG Order Sort ALL

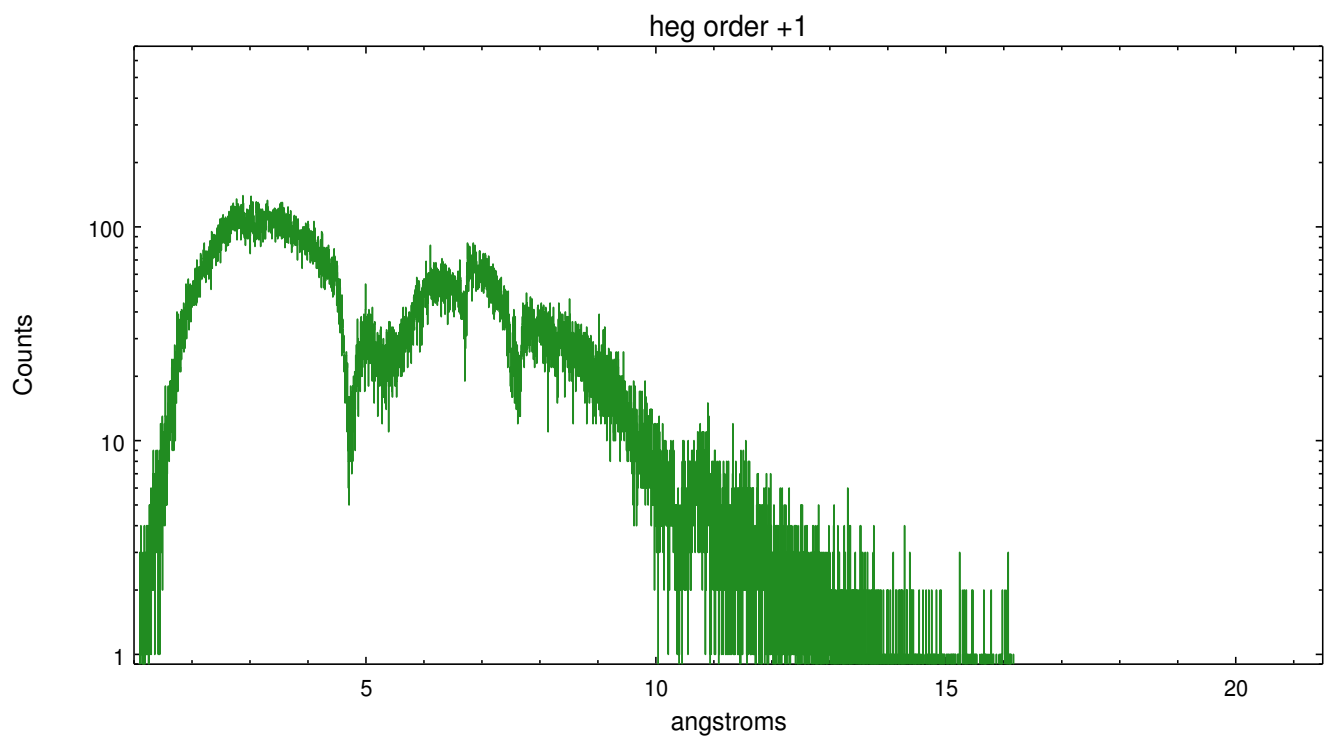
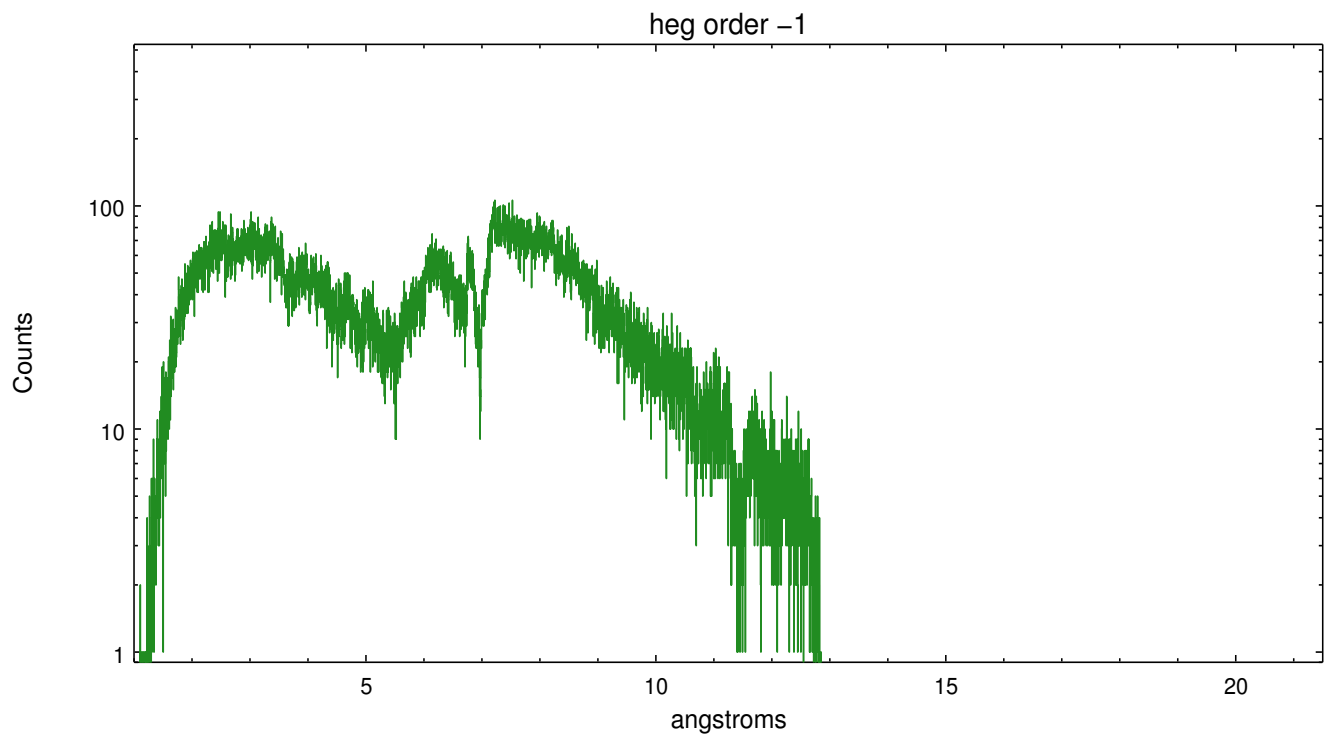


Spot Image HEG

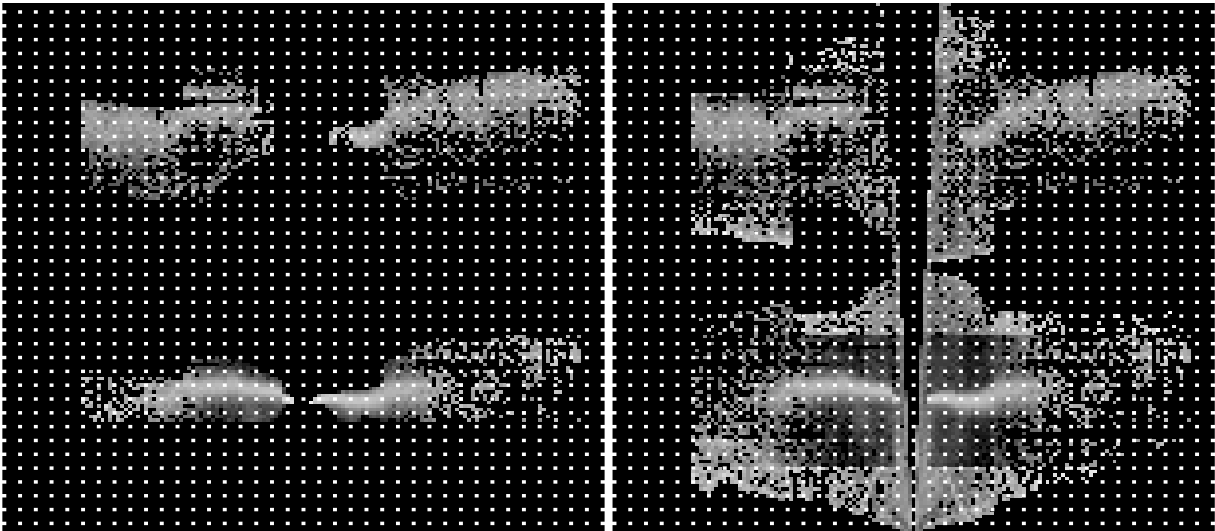
Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	5587	13555	170731	714849	171913	11355	4079



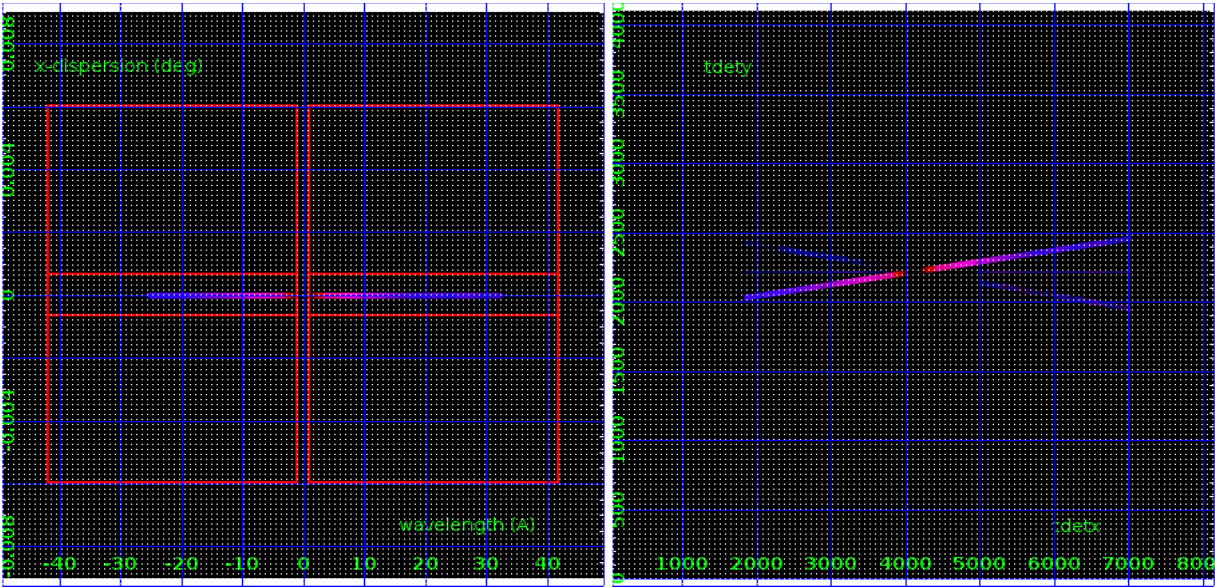


3.2 MEG Arm



MEG Order Sort 123

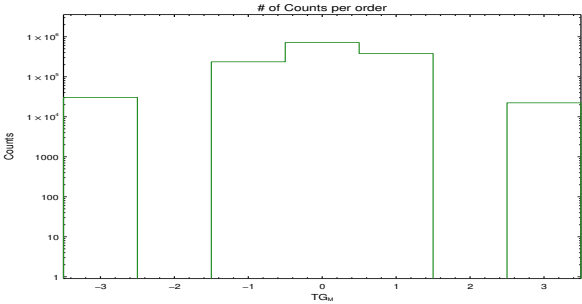
MEG Order Sort ALL

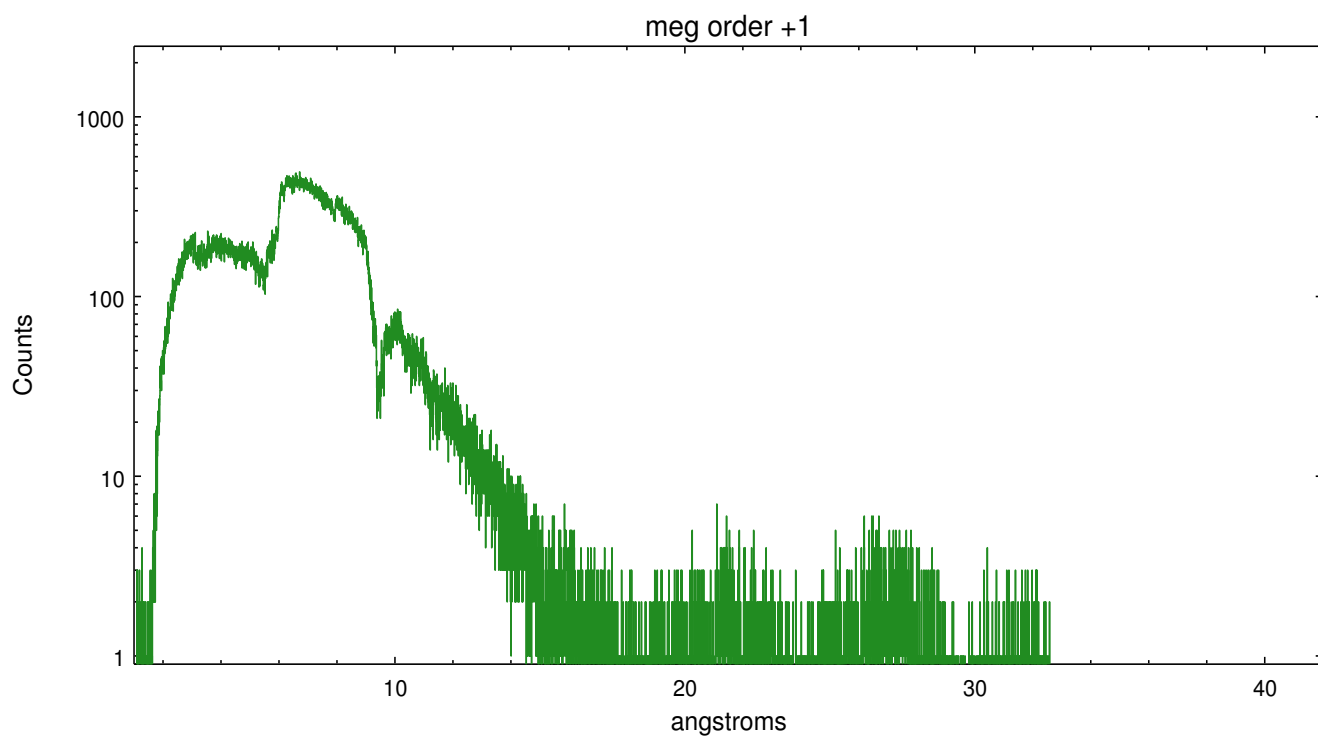
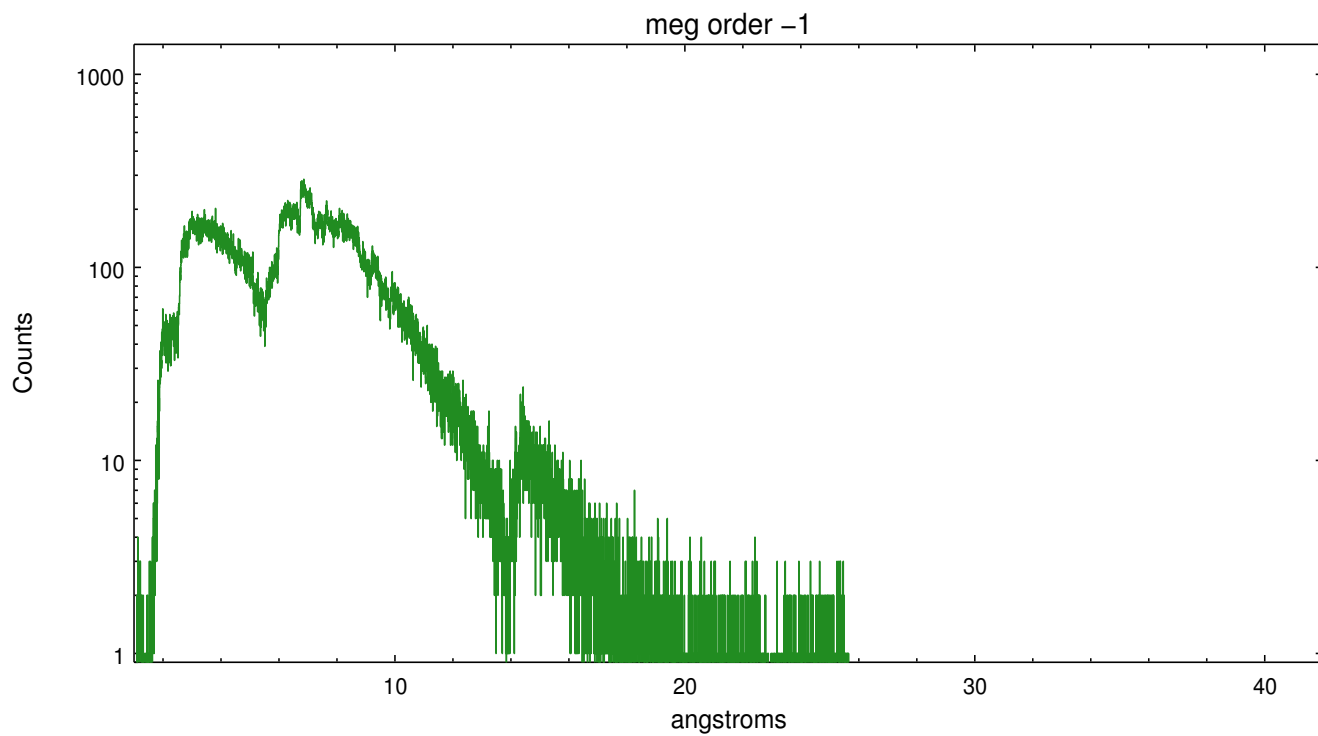


Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	30352	0	236764	714849	379856	0	22331





# A Summary

## A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2019.09.30
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	25

## A.2 Comments

ACIS T\_GAIN files released in CalDB 4.8.3 (23 May 2019) and CalDB 4.8.4 (03 September 2019) have errors in the T\_GAIN corrections for ACIS-I chips 0, 1, 2, and 3, and ACIS-S chip 6 (S2). All ACIS OBS\_IDs including those chips, which were processed (or reprocessed) in SDP between 2019-05-24T01:06:00 and 2019-09-06T17:31:43 with CalDB 4.8.3, 4.8.3.1, or 4.8.4, were affected. The errors in the T\_GAINs, which produce a 1%-2% reduction in the PHA and hence the ENERGY column values for dithered observations, result from alternating real value and zero value columns in CHIPX space across FI chips ACIS-0, 1, 2, 3, and 6. The error has been corrected in this version of the data products.

==

Note: due to the brightness of the source, there is substantial telemetry saturation which makes the good-time-intervals sum to less than the nominal exposure time. The exposure duration did last for the intended 25 ks.