

# V&V Reference Report

## L2 ASCDS Version : 10.8

Observation 22857 - L2 Version 1  
Chandra X-Ray Center

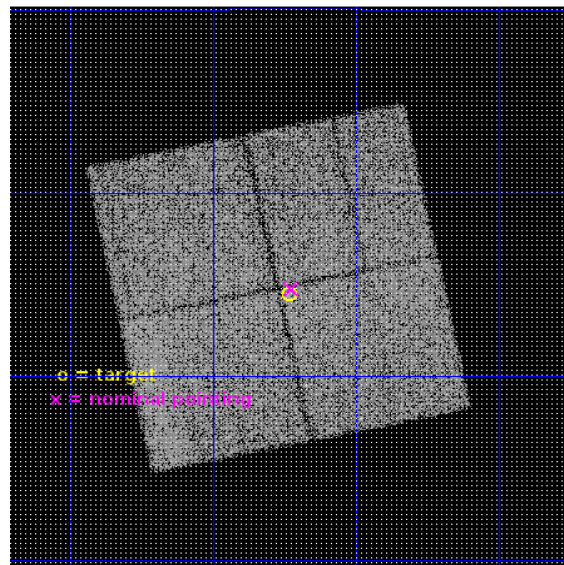
L2 Processing Date : Sep 28 2019

## 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>A</b>	<b>Summary</b>	<b>17</b>
A.1	Status . . . . .	17
A.2	Comments . . . . .	17

# 1 Front

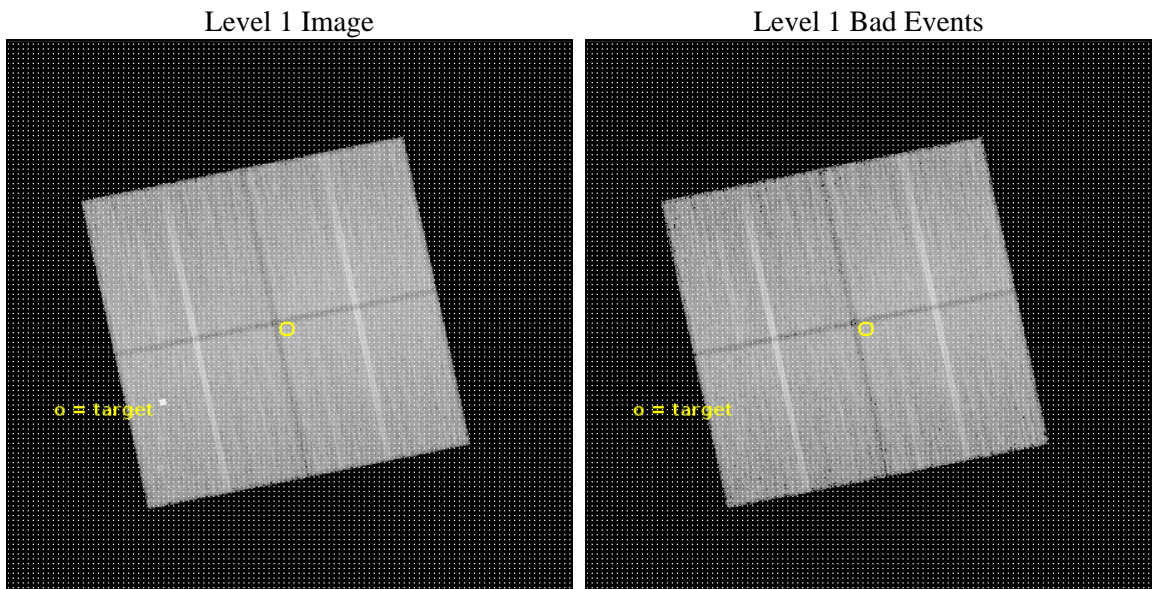
seq_num	703950	Sequence number
obs_id	22857	Observation id
title	Unveiling the AGN population in the highest redshift, mature, massive galaxy cluster	Proposal title
observer	Emil Noordeh	Principal investigator
object	XLSSC 122	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	34.433	Observer's specified target RA [deg]
dec_targ	-3.759	Observer's specified target Dec [deg]
ra_nom	34.431268411422	Nominal RA [deg]
dec_nom	-3.7536505690753	Nominal Dec [deg]
roll_nom	78.208580981611	Nominal Roll [deg]
revision	1	Processing version of data
ontime	40070.319197774	Sum of GTIs [s]
livetime	39546.770978115	Livetime [s]
ontime0	40076.478248477	Sum of GTIs [s]
ontime1	40070.237217903	Sum of GTIs [s]
ontime2	40070.278337836	Sum of GTIs [s]
ontime3	40070.319197774	Sum of GTIs [s]
l2events	112403	Number of level 2 events



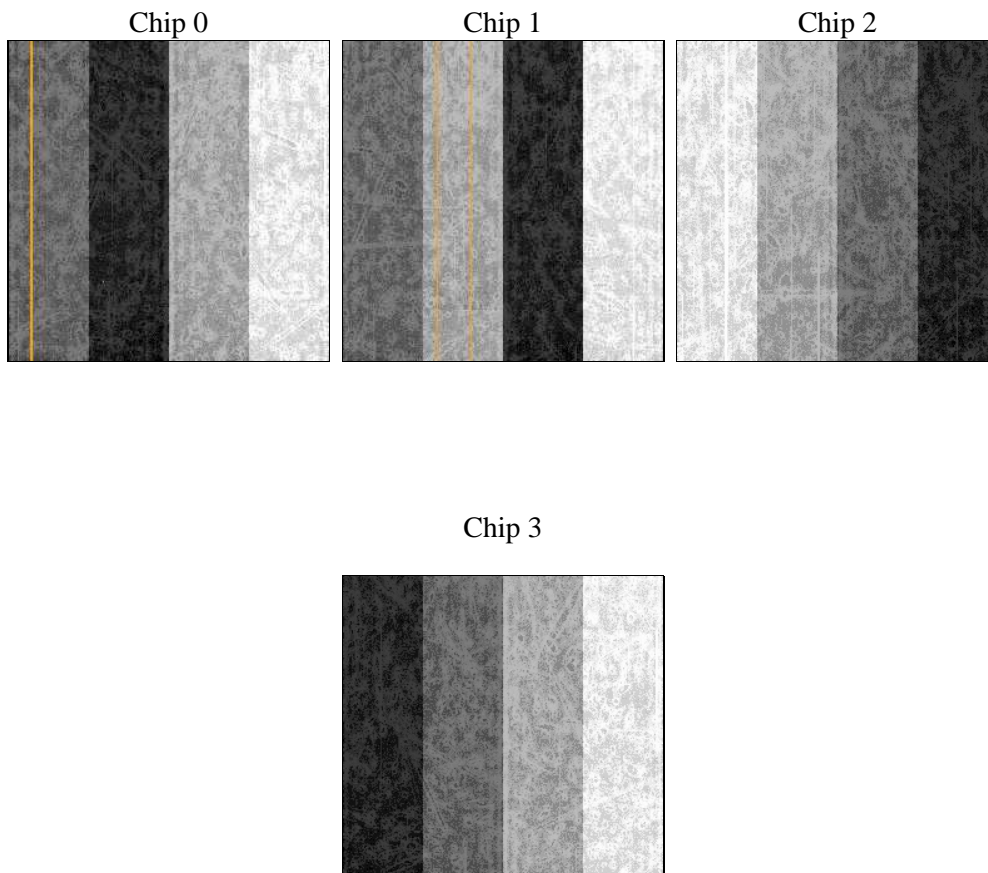
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	40000.000000	[s] Scheduled observation exposure time
ascdsver	10.8	Processing system revision	ontime	40070.319197774	Sum of GTIs [s]
caldsver	4.8.4.1	&#160	ontime0	40076.478248477	Sum of GTIs [s]
date	2019-09-28T23:22:42	Date and time of file creation	ontime1	40070.237217903	Sum of GTIs [s]
revision	1	Processing version of data	ontime2	40070.278337836	Sum of GTIs [s]
			ontime3	40070.319197774	Sum of GTIs [s]
			l1events	1201978	Number of level 1 events

### 2.1.4 Events

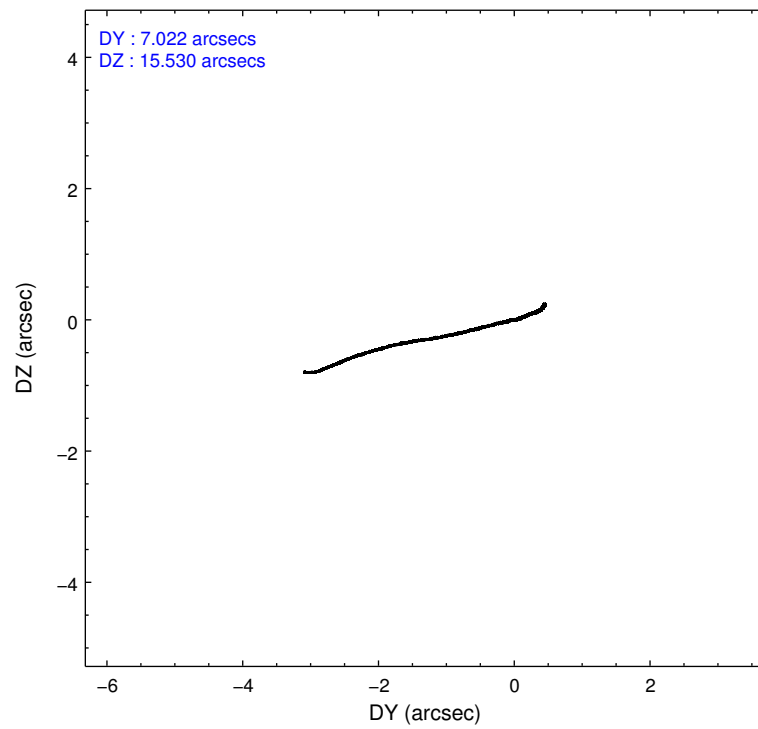
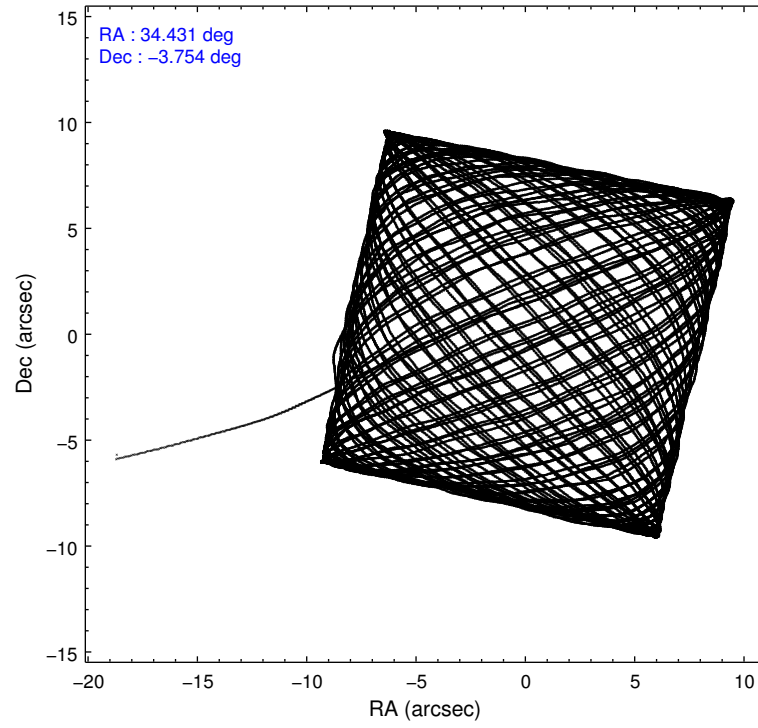
	ccd 0	ccd 1	ccd 2	ccd 3
level 1 events	284018	292822	319773	305365
rejected events	250217	250886	287558	274001
rejected %	88%	85%	89%	89%

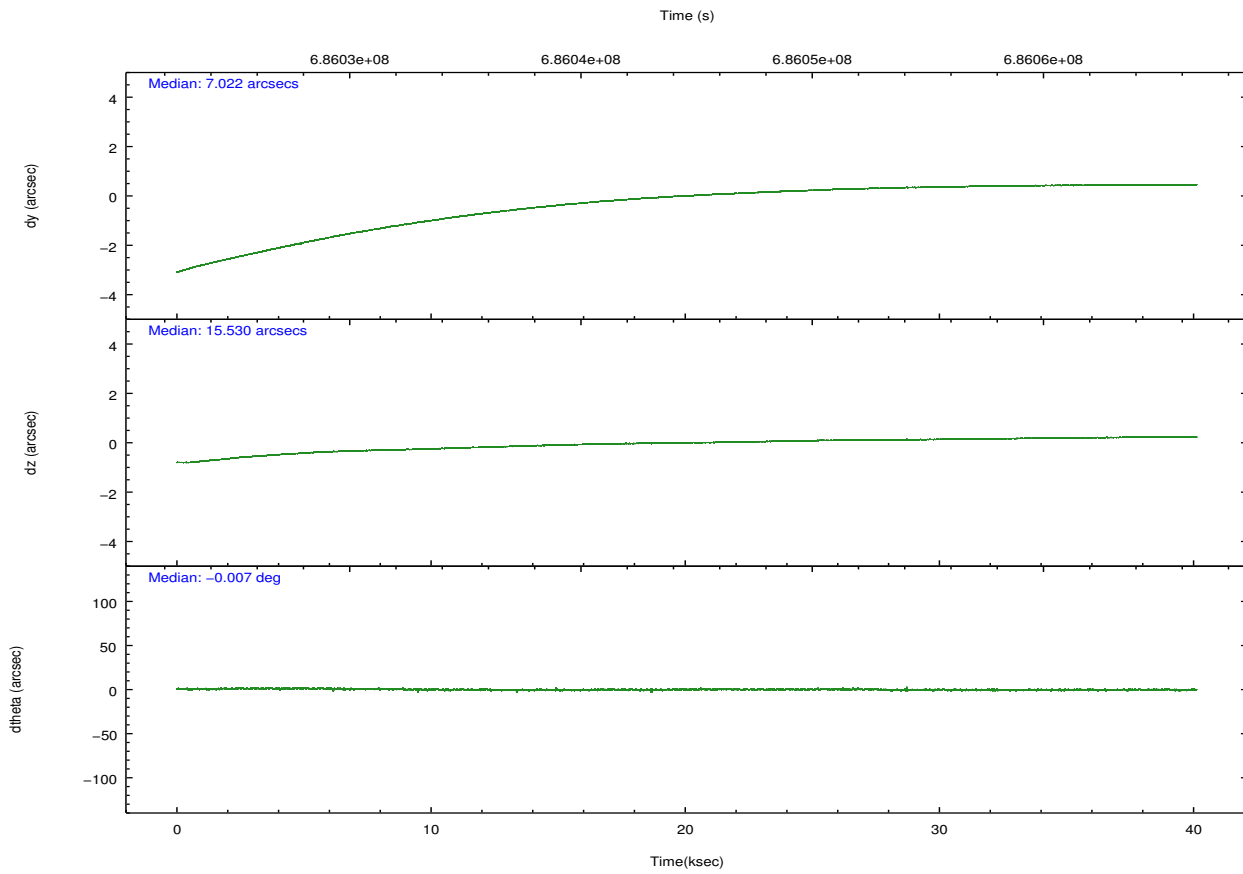
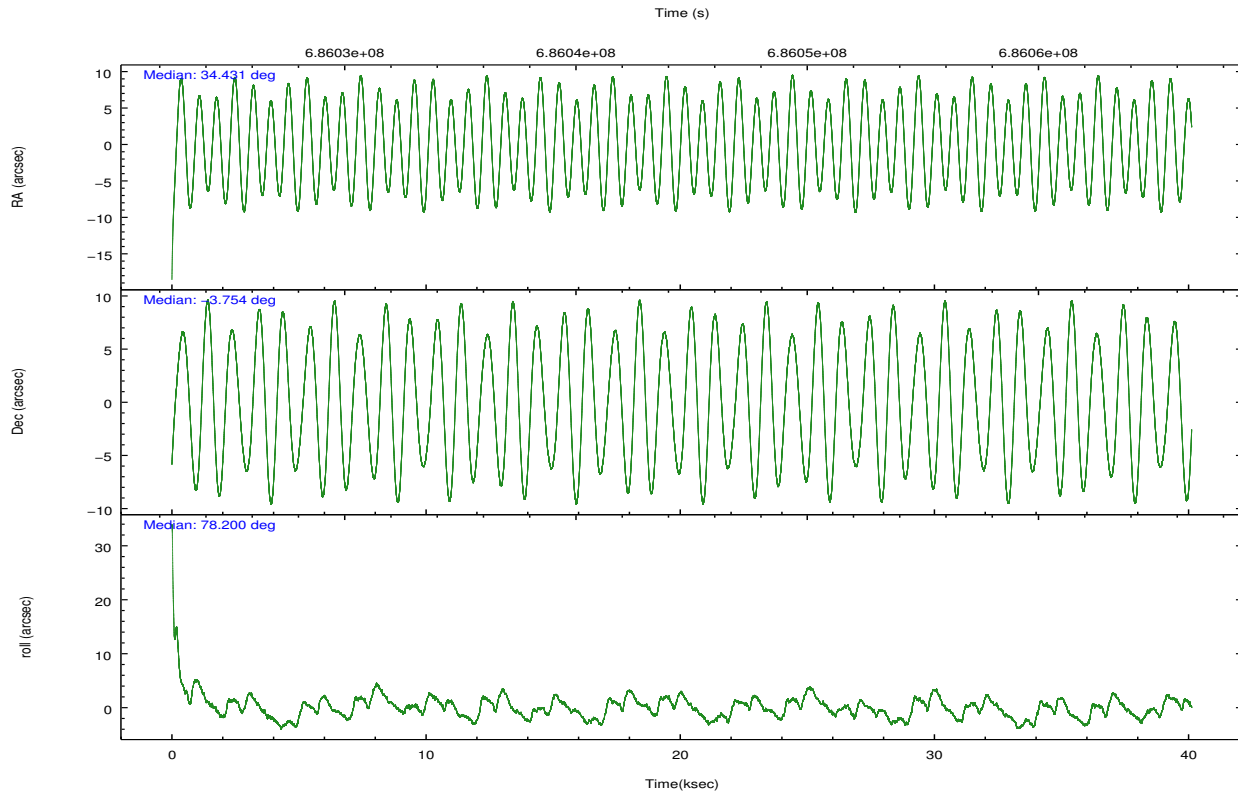
	ccd 0	ccd 1	ccd 2	ccd 3
grade 0 events	11008	16435	11377	10993
	3%	5%	3%	3%
grade 1 events	150	175	180	169
	0%	0%	0%	0%
grade 2 events	8665	9998	7803	6964
	3%	3%	2%	2%
grade 3 events	3297	3218	3144	3217
	1%	1%	0%	1%
grade 4 events	3226	3191	3249	3229
	1%	1%	1%	1%
grade 5 events	12553	12603	11838	14083
	4%	4%	3%	4%
grade 6 events	7606	9099	6643	6962
	2%	3%	2%	2%
grade 7 events	237513	238103	275539	259748
	83%	81%	86%	85%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-0123	ACIS-0123	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	Obspar update status	NONE	UPDATED
Data mode	VFAINT	VFAINT	CCD I0 on	Y	Y
Observation mode	POINTING	POINTING	CCD I1 on	Y	Y
[deg] Pointing RA	34.440005	34.43126841142226	CCD I2 on	Y	Y
[deg] Pointing Dec	-3.779828	-3.753650569075285	CCD I3 on	Y	Y
[deg] Pointing Roll	78.000456	78.20858098161121	CCD S0 on	N	N
[mm] SIM focus pos	-0.782348	-0.7809083437167272	CCD S1 on	N	N
[mm] SIM defocus	0	0.001439871863259334	CCD S2 on	O1	N
[mm] SIM translation stage pos	-233.592463	-233.5874344608287	CCD S3 on	N	N
[mm] SIM translation stage offset	0	-0.005018542100998502	CCD S4 on	N	N
[s] Observation start time (MET)	686024649.184000	686023534.71083	CCD S5 on	N	N
Observation start date	2019-09-28T02:23:00	2019-09-28T02:05:34	Number of optional ACIS chips dropped	1	1
[s] Observation end time (MET)	686064649.184000	686065521.78835	On-chip summing requested	N	N
Observation end date	2019-09-28T13:29:40	2019-09-28T13:45:21	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

## 2.3 Aspect





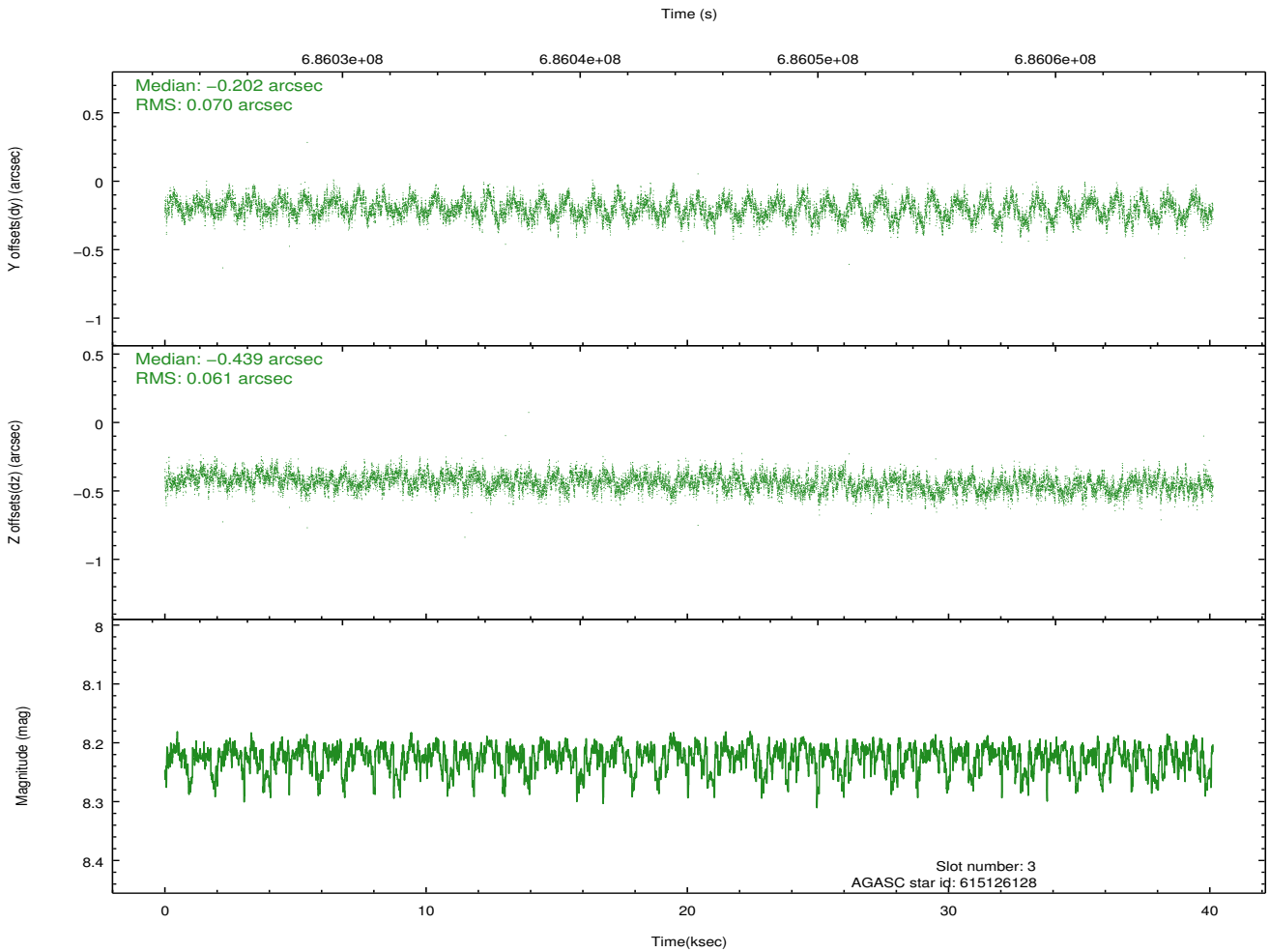
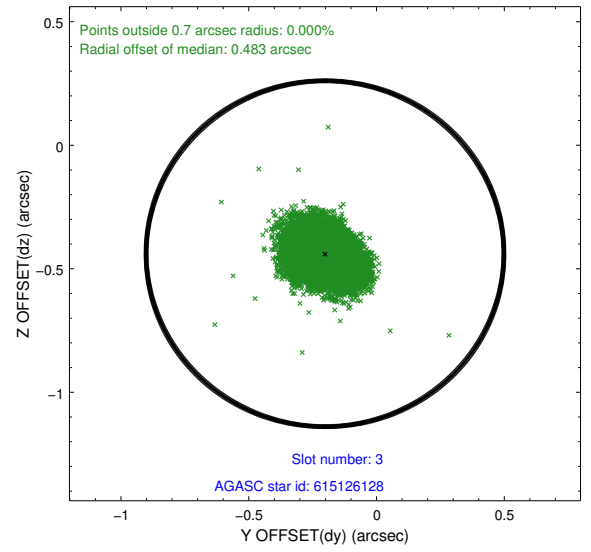
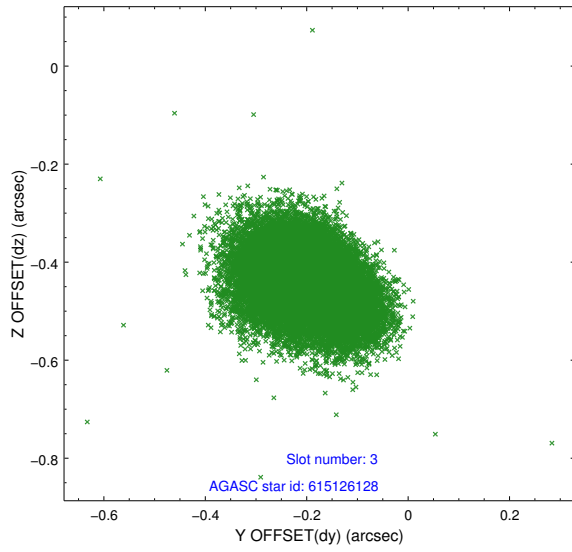
### Slot Statistics

slot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_x
0	FID		ACIS-I-1	7.26	9785	1.000	0.126	-0.171	0.017	0.050	0.000000	0.000000	933.29	-839
1	FID		ACIS-I-5	7.23	9784	1.000	-0.452	0.037	0.017	0.048	0.000000	0.000000	-1815.53	1058
2	FID		ACIS-I-6	7.22	9786	1.000	0.233	0.206	0.023	0.079	0.000000	0.000000	398.71	1703
3	GUIDE	used	615126128	8.22	19563	1.000	-0.202	-0.439	0.100	0.158	34.026050	-3.868420	-621.77	1387
4	GUIDE	used	615129592	8.88	19559	1.000	0.069	0.270	0.241	0.354	34.607456	-4.334536	-1828.55	-1003
5	GUIDE	used	615129680	9.00	19553	1.000	0.093	0.299	0.140	0.215	34.462822	-4.356201	-2012.24	-510
6	GUIDE	used	615129992	8.39	19497	1.000	-0.067	-0.427	0.131	0.224	33.989595	-4.095121	-1447.28	1342
7	GUIDE	used	615130056	6.93	19569	1.000	0.069	0.284	0.101	0.170	34.919909	-4.345572	-1633.92	-2108

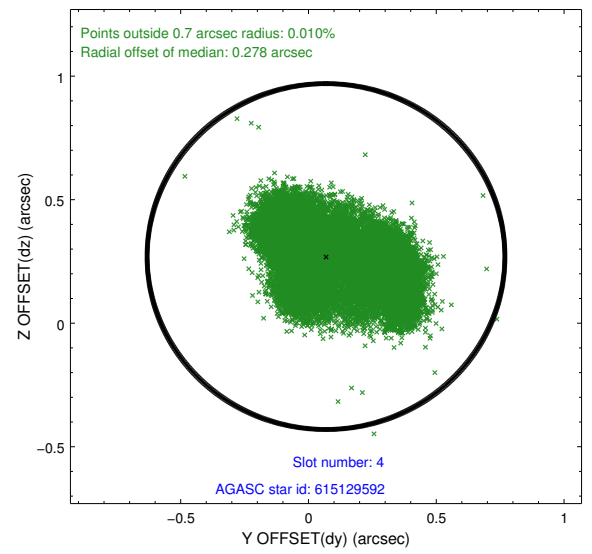
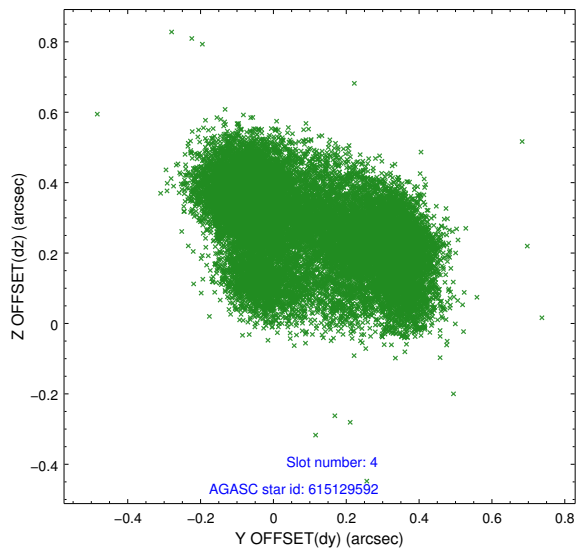
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## 2.4 Star Slots

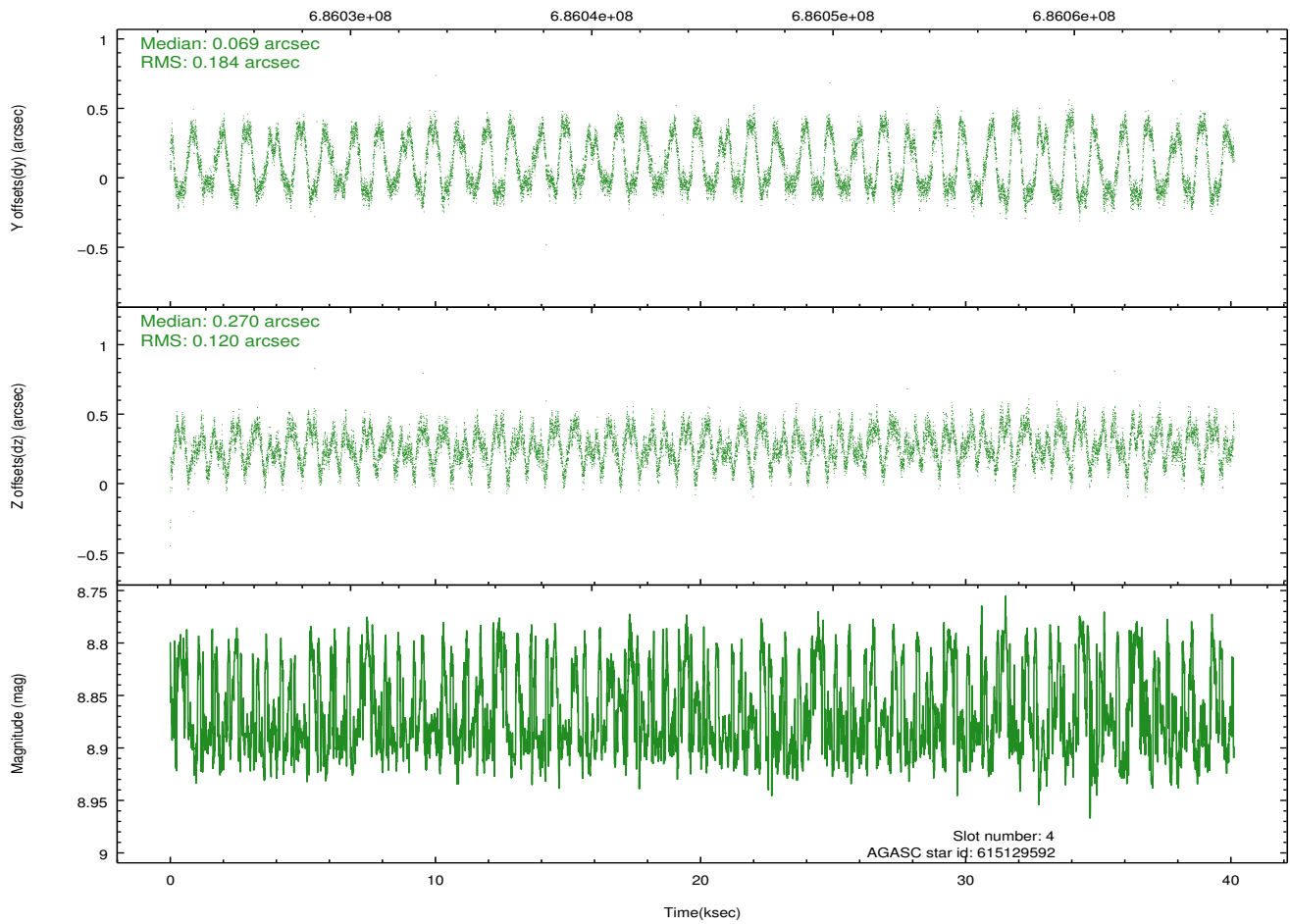
### 2.4.1 Slot 3



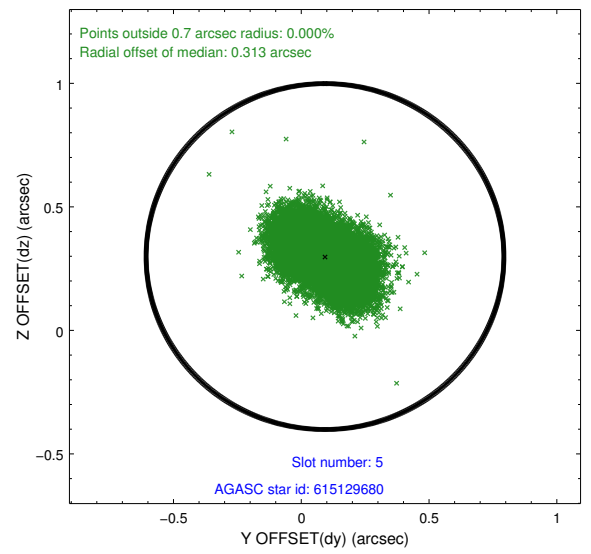
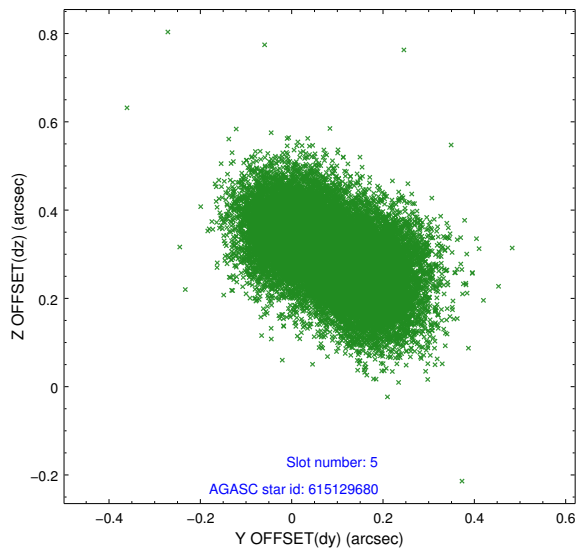
## 2.4.2 Slot 4



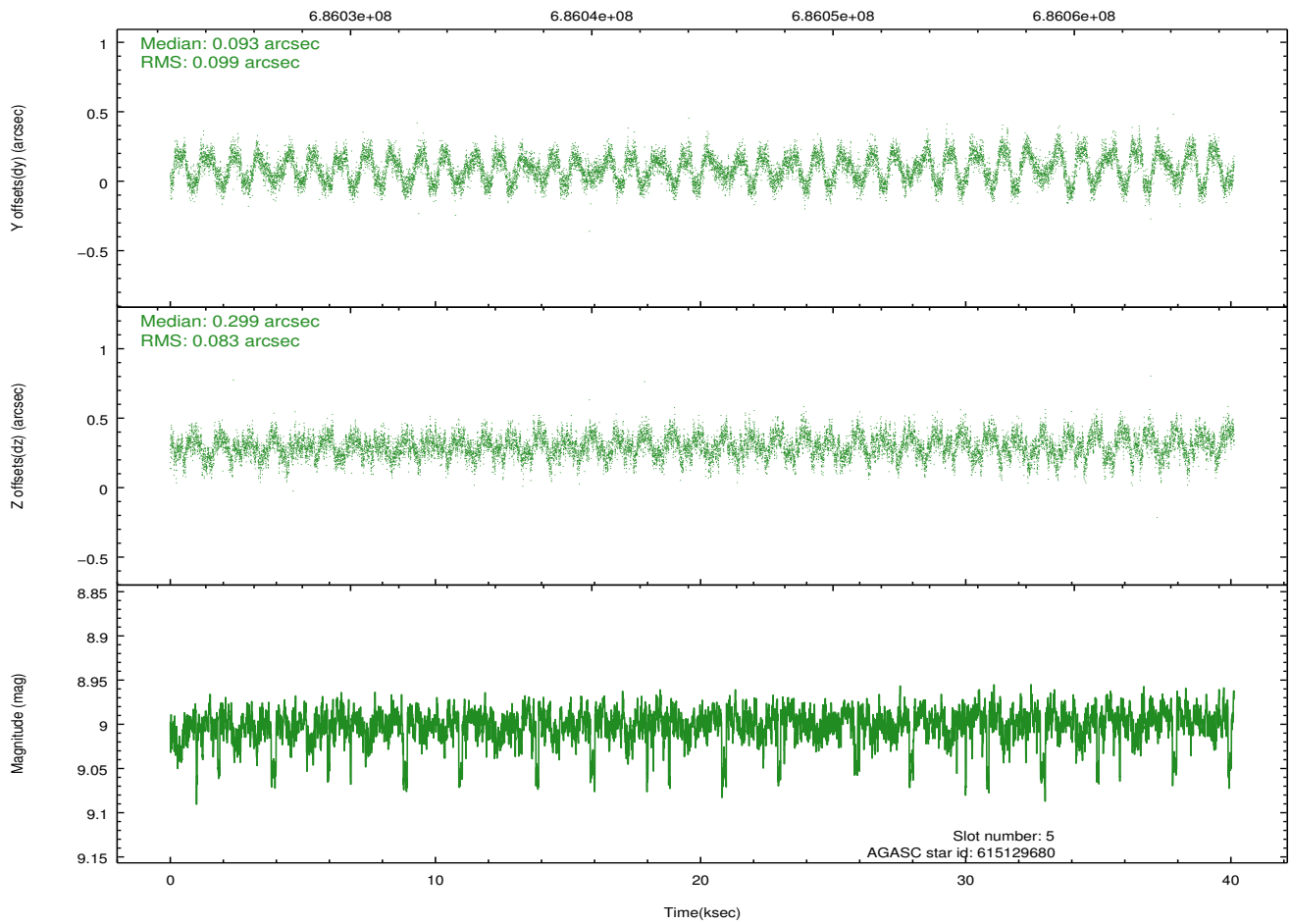
Time (s)



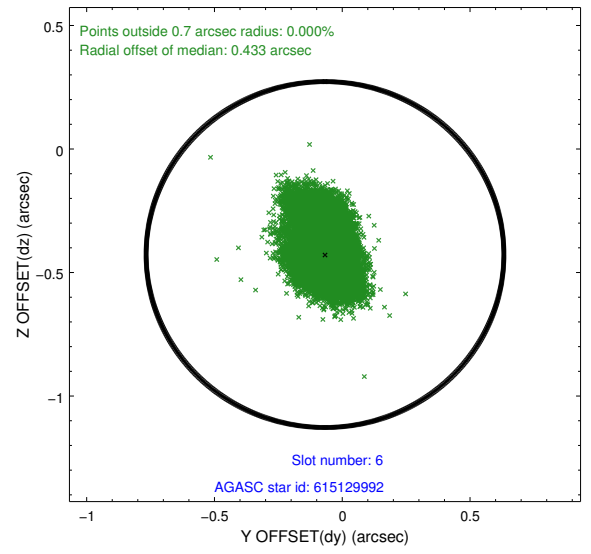
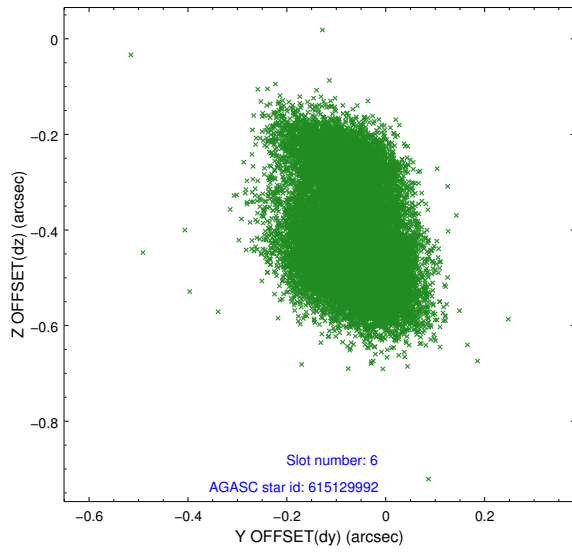
### 2.4.3 Slot 5



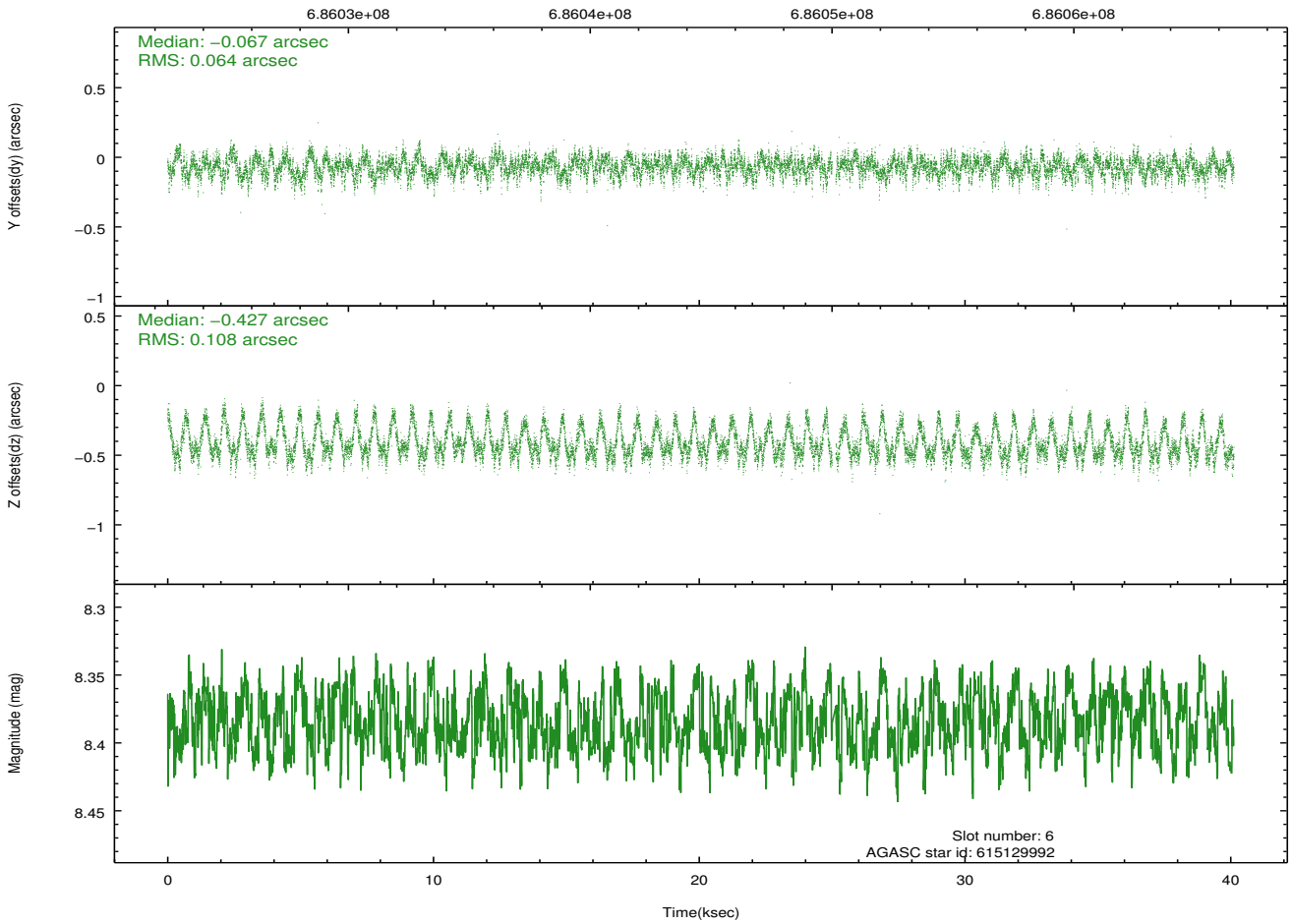
Time (s)



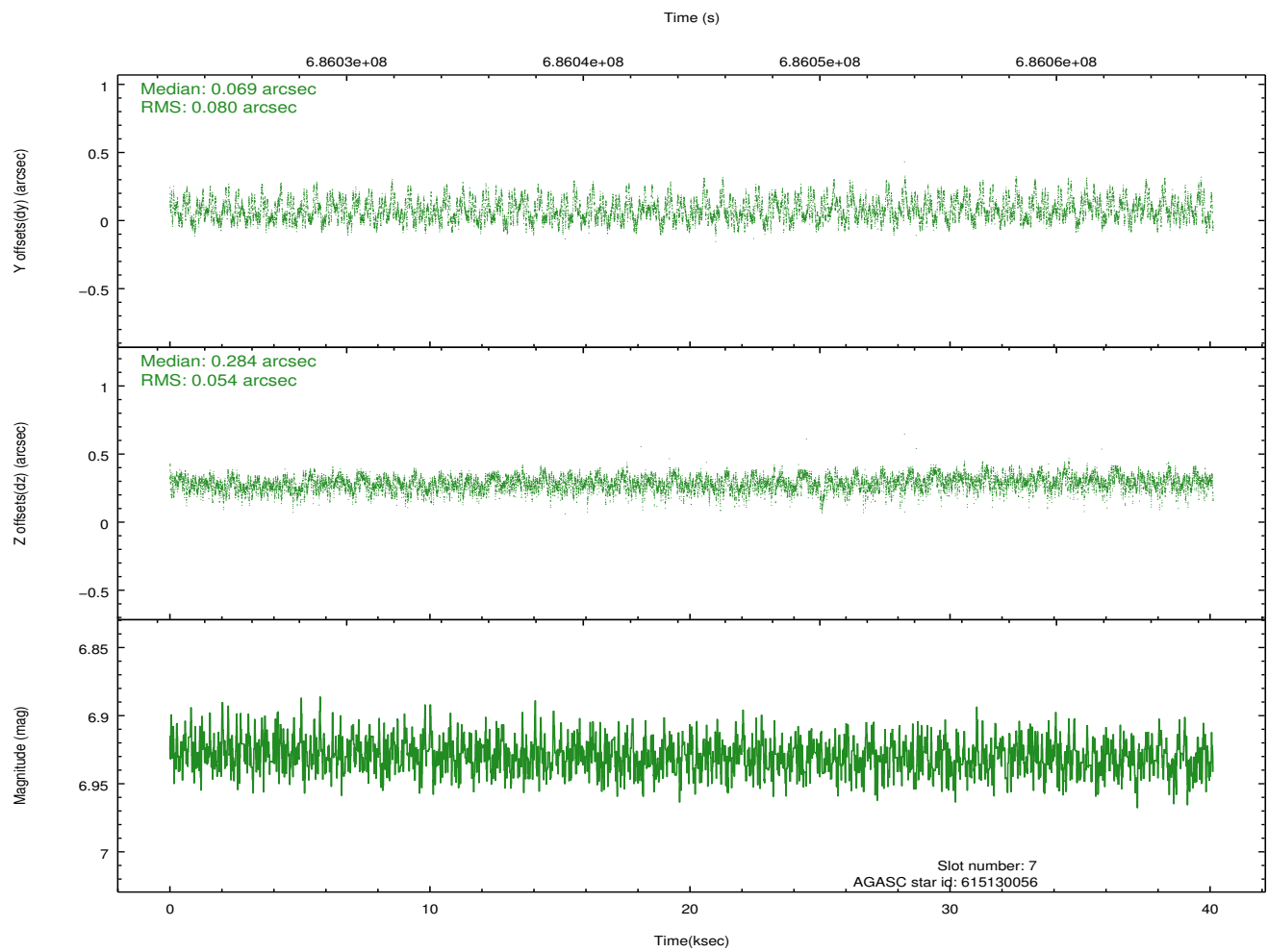
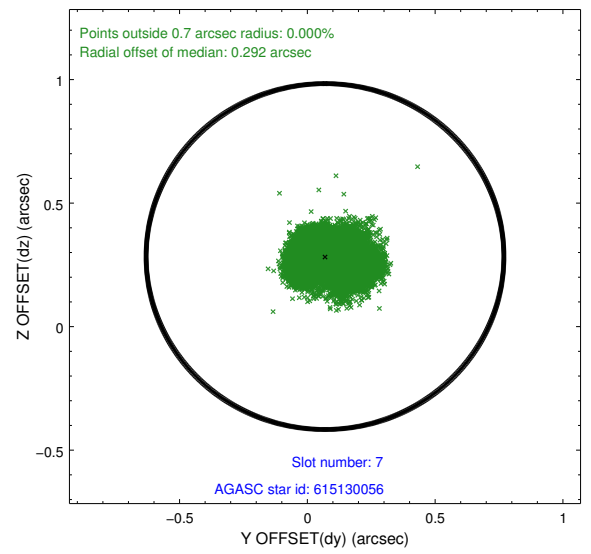
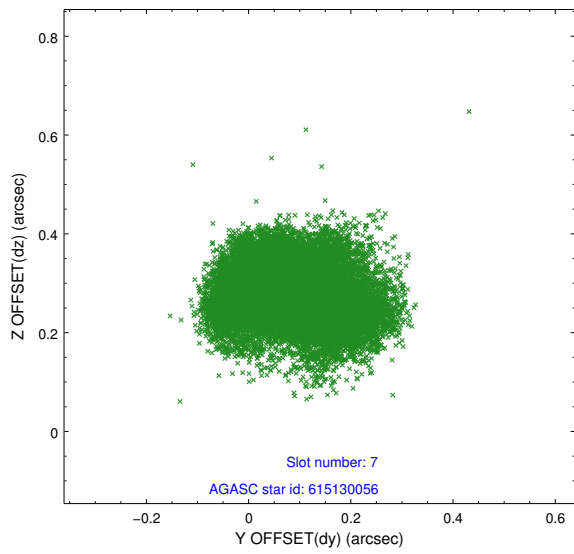
### 2.4.4 Slot 6



Time (s)

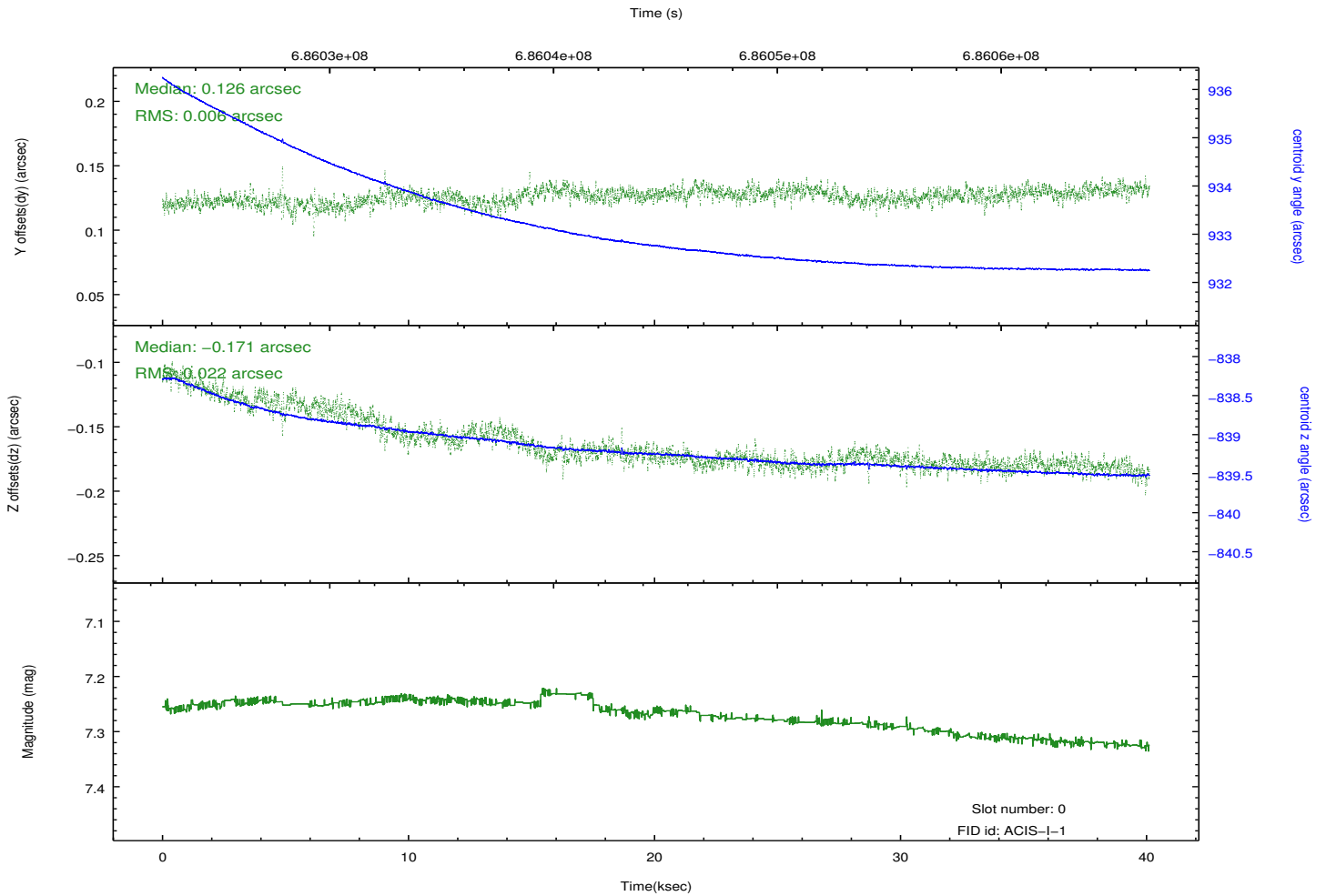
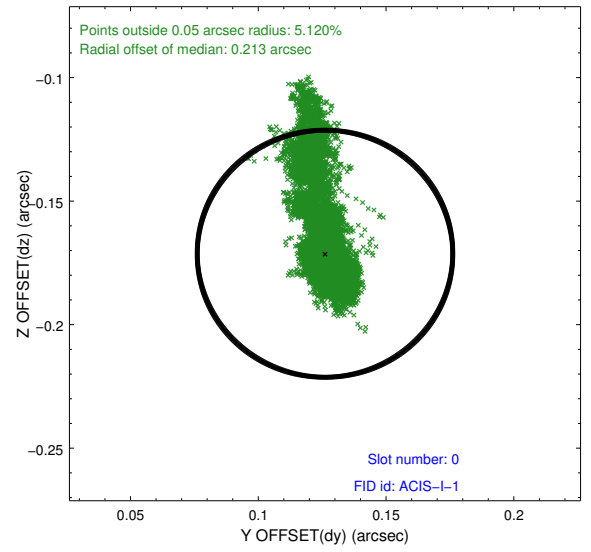
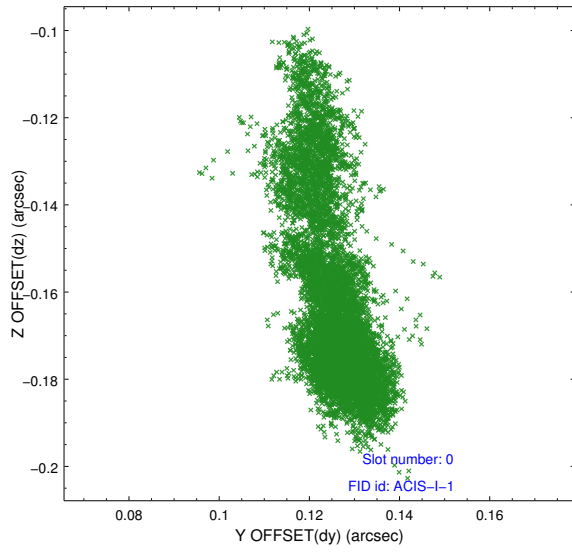


## 2.4.5 Slot 7

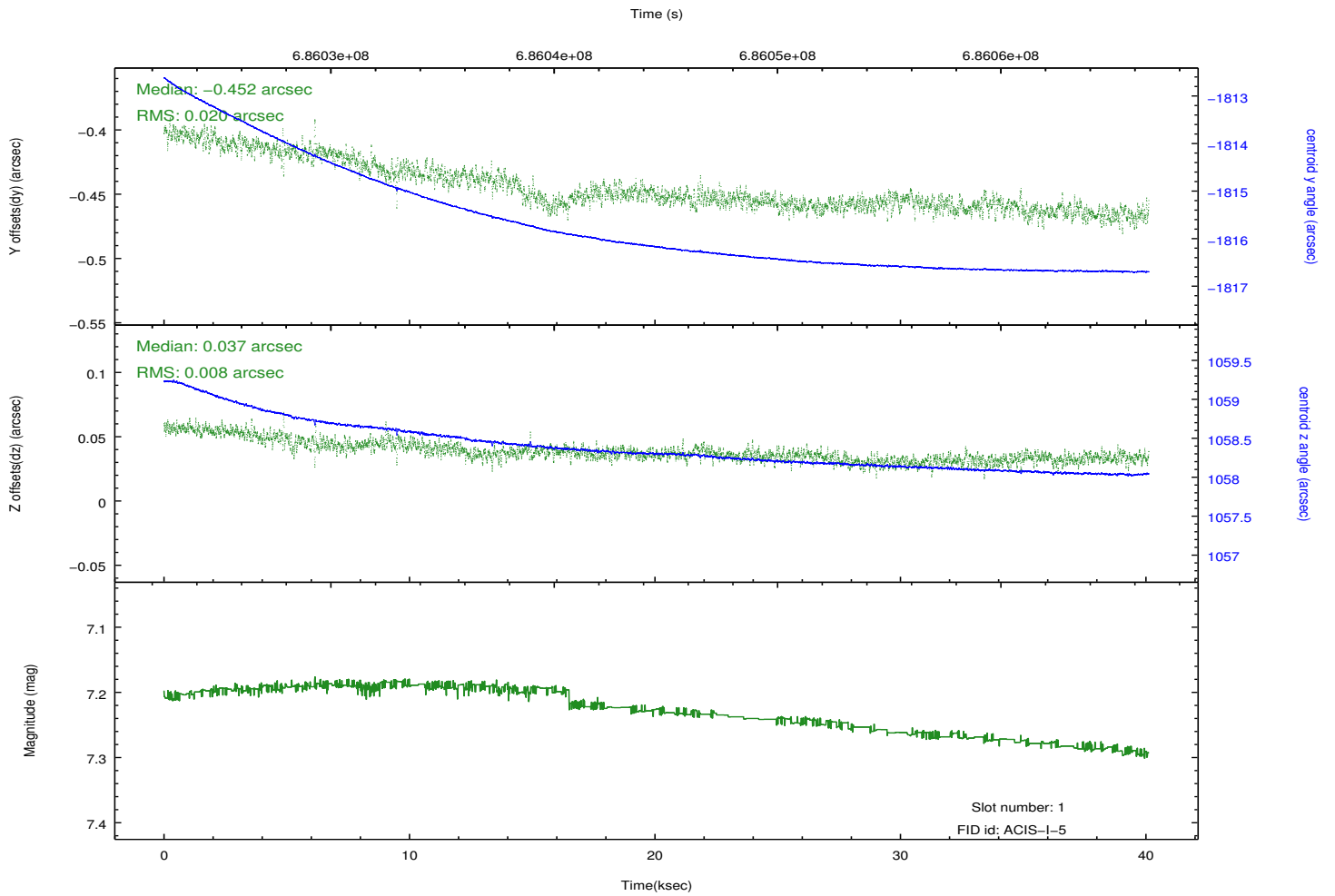
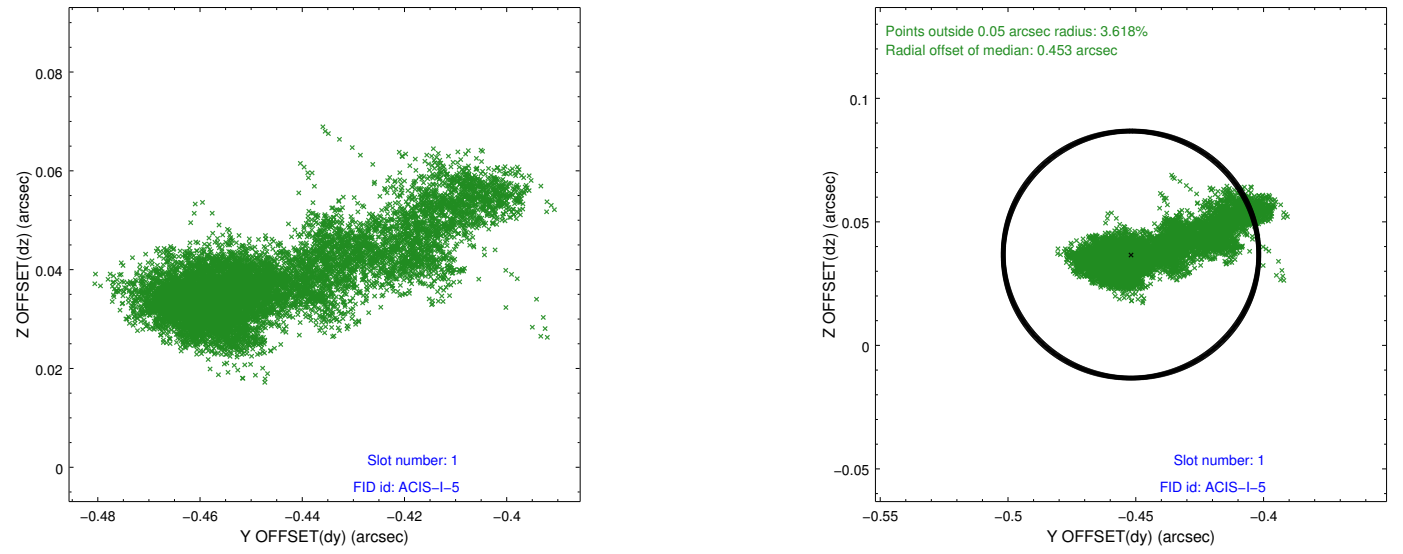


## 2.5 FID Slots

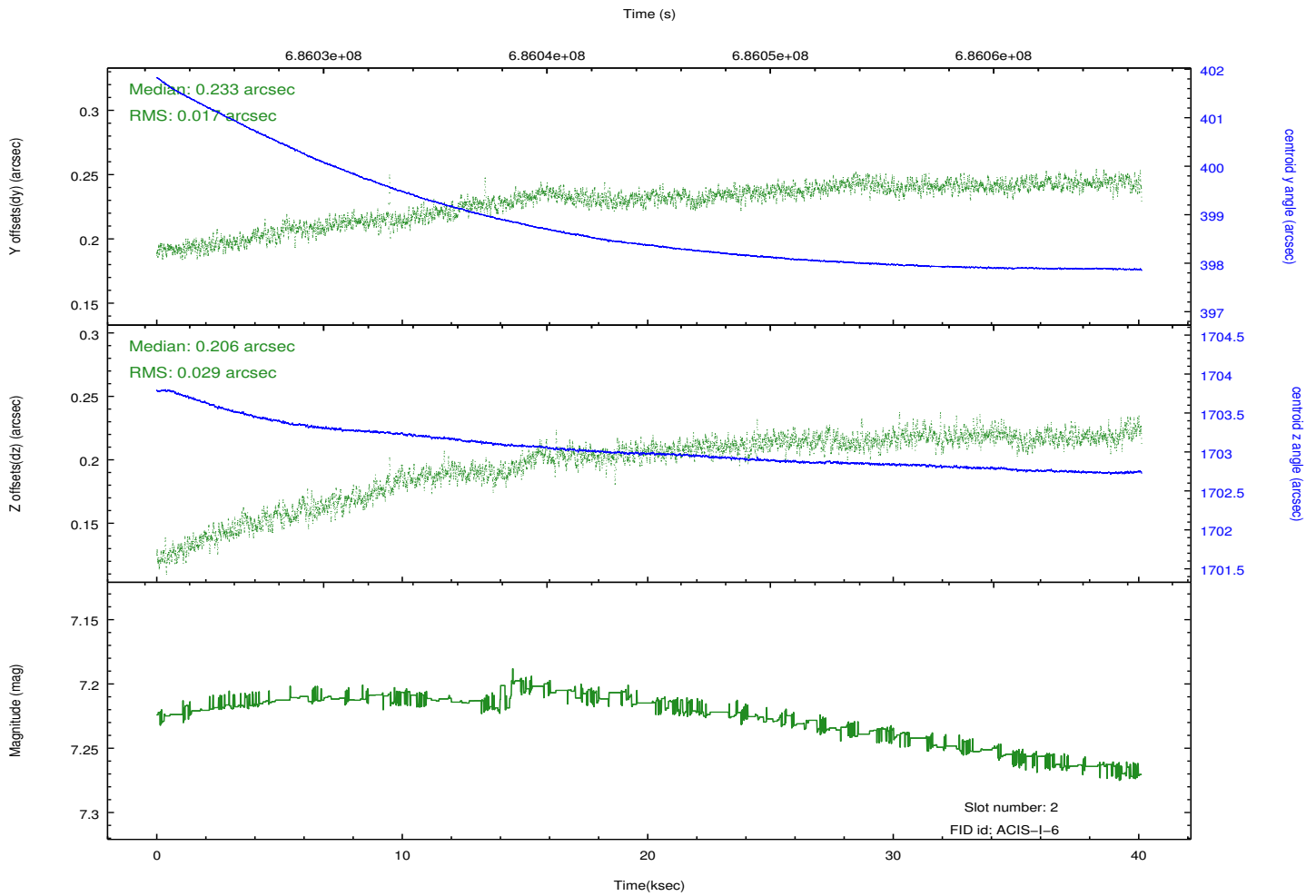
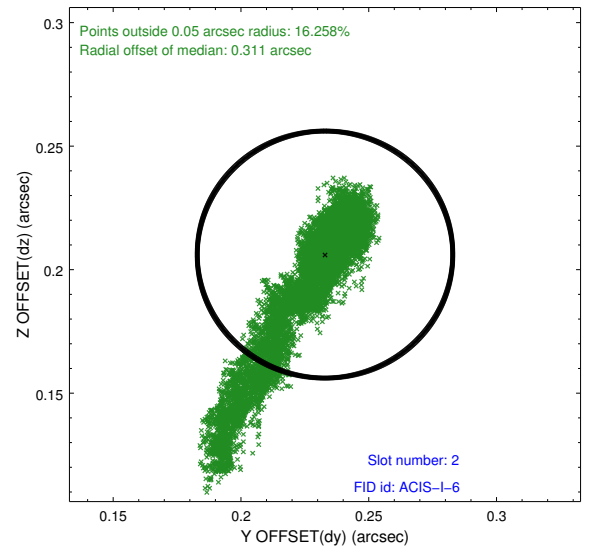
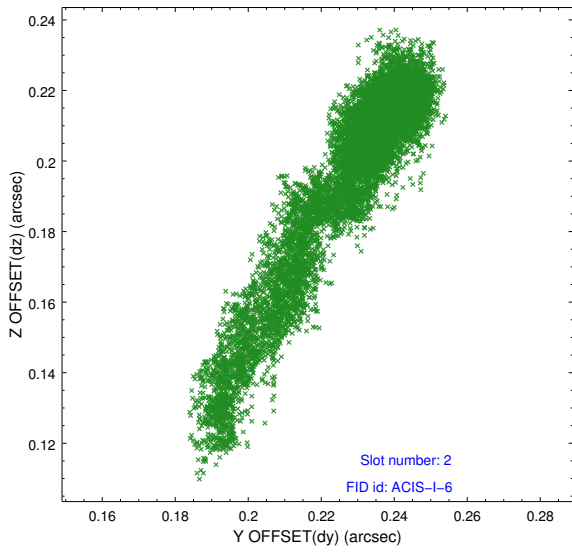
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2020.04.02
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	40.070319197774

## A.2 Comments

One optional chip was dropped.

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The focal plane temperature during part of this observation was warmer than the upper limit for optimum calibration of the ACIS gain and spectral resolution (i.e., -112.0 C for ACIS-I).

The Chandra calibration team calibrates the ACIS gain and spectral resolution using data from the external calibration source (ECS). ECS data show that the frontside-illuminated (FI) CCDs are more temperature sensitive than the backside-illuminated (BI) CCDs.

A summary of the current calibration status of the ACIS gain and spectral resolution can be found at:

[http://asc.harvard.edu/cal/Acis/Cal\\_prods/Gain\\_and\\_Spectral\\_Resolution/ACIS\\_response\\_summary.html](http://asc.harvard.edu/cal/Acis/Cal_prods/Gain_and_Spectral_Resolution/ACIS_response_summary.html)

The main points are:

- 1) The gain on BI chips remains within 0.3% (i.e., the systematic uncertainty in the ACIS gain quoted on the Chandra Calibration Status Summary web page) at all measured temperatures.
  - 2) The gain on FI chips remains within 0.3% below row 600 at all measured temperatures.
  - 3) The gain on FI chips above row 600 can be underestimated by as much as 1% for focal plane temperatures exceeding -116 C.
  - 4) The spectral resolution (i.e., FWHM) on BI chips is insensitive to the focal plane temperature.
  - 5) Warmer focal plane temperatures increase the FWHM on FI chips by up to 30 eV near row 512 and by up to 70 eV near the top of the chips.
- In summary, the user should be cautious in the spectral analysis of high S/N emission lines detected on the top half of FI chips in this observation. Default processing with the current version of the CALDB will underestimate photon energies by up to 1% and broaden emission lines by up to 70 eV.