

# V&V Reference Report

## L2 ASCDS Version : 10.5

Observation 18631 - L2 Version 1  
Chandra X-Ray Center

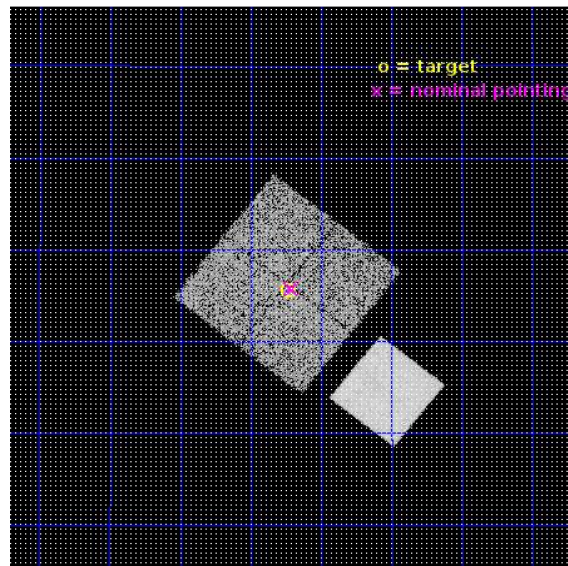
L2 Processing Date : Aug 10 2016

## 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

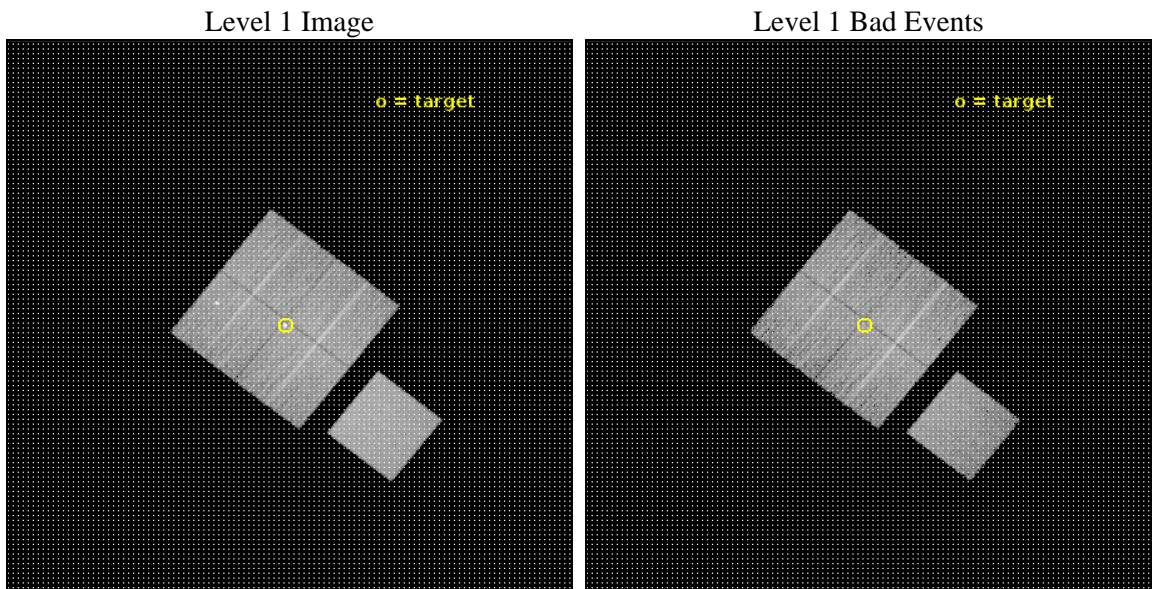
seq_num	801639	Sequence number
obs_id	18631	Observation id
title	Lensing Calibration of the Evolution of Cluster Scaling Relations for eROSITA	Proposal title
observer	Dr. Peter Predehl	Principal investigator
object	CODEX 50514	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	353.05875	Observer's specified target RA [deg]
dec_targ	10.592278	Observer's specified target Dec [deg]
ra_nom	353.05278079561	Nominal RA [deg]
dec_nom	10.59565084728	Nominal Dec [deg]
roll_nom	128.22042260112	Nominal Roll [deg]
revision	1	Processing version of data
ontime	11807.900090933	Sum of GTIs [s]
livetime	11653.621183395	Livetime [s]
ontime0	11807.900090933	Sum of GTIs [s]
ontime1	11807.900090933	Sum of GTIs [s]
ontime2	11807.900090933	Sum of GTIs [s]
ontime3	11807.900090933	Sum of GTIs [s]
ontime7	11807.900090933	Sum of GTIs [s]
l2events	66853	Number of level 2 events



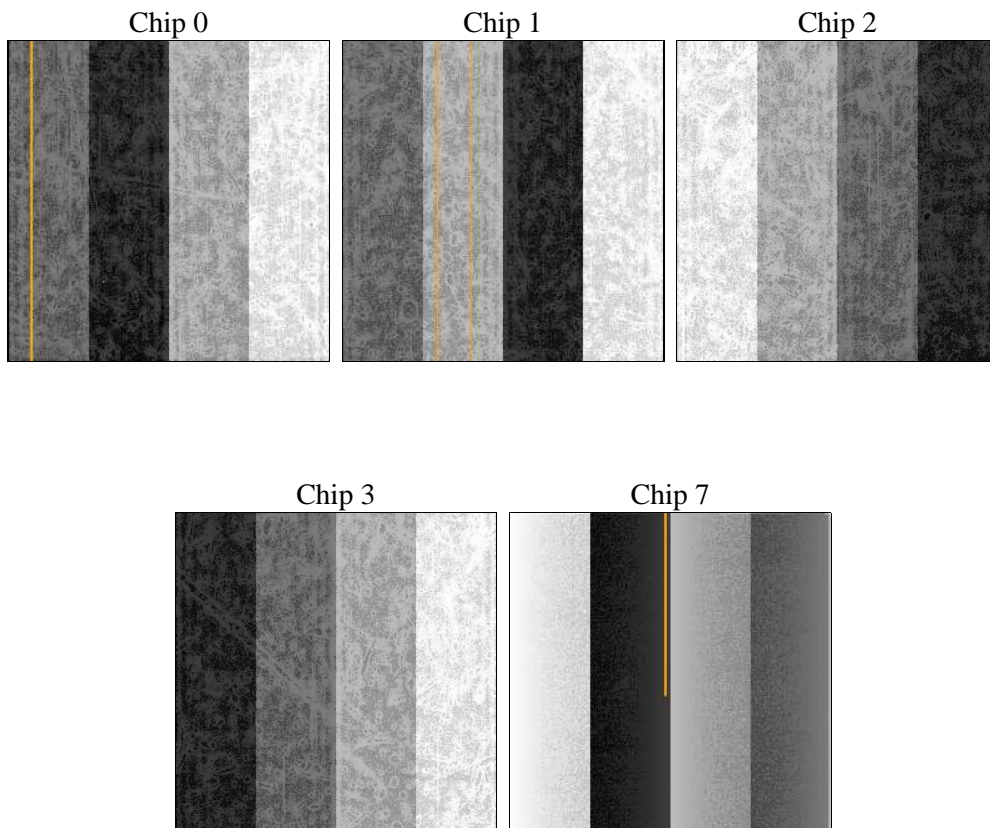
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	11748.915000	[s] Scheduled observation exposure time
ascdsver	10.5	Processing system revision	ontime	11807.900090933	Sum of GTIs [s]
caldbver	4.7.2	&#160	ontime0	11807.900090933	Sum of GTIs [s]
date	2016-08-10T15:09:28	Date and time of file creation	ontime1	11807.900090933	Sum of GTIs [s]
revision	1	Processing version of data	ontime2	11807.900090933	Sum of GTIs [s]
			ontime3	11807.900090933	Sum of GTIs [s]
			ontime7	11807.900090933	Sum of GTIs [s]
			l1events	396276	Number of level 1 events

### 2.1.4 Events

	ccd 0	ccd 1	ccd 2	ccd 3	ccd 7
level 1 events	70563	73170	76321	79294	96928
rejected events	62307	62862	68574	68152	56091
rejected %	88%	85%	89%	85%	57%

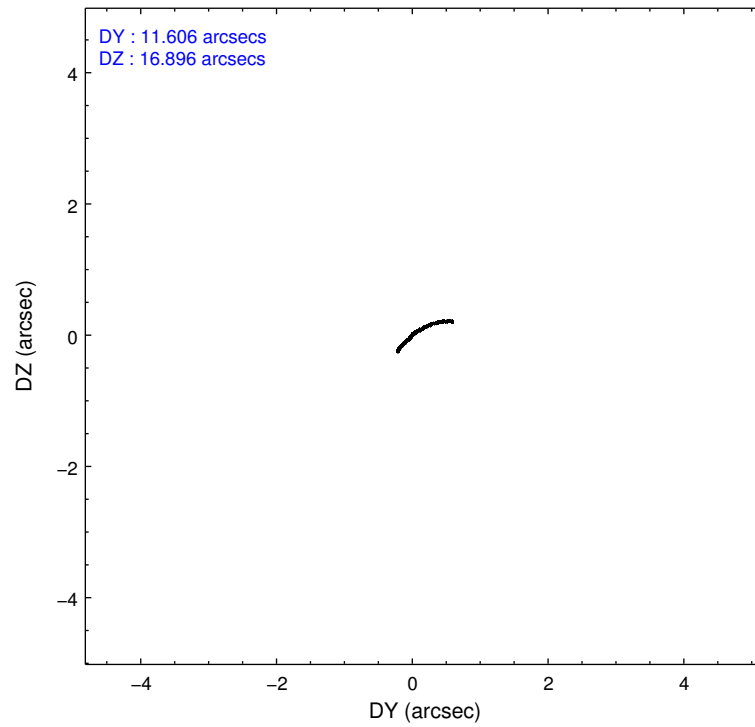
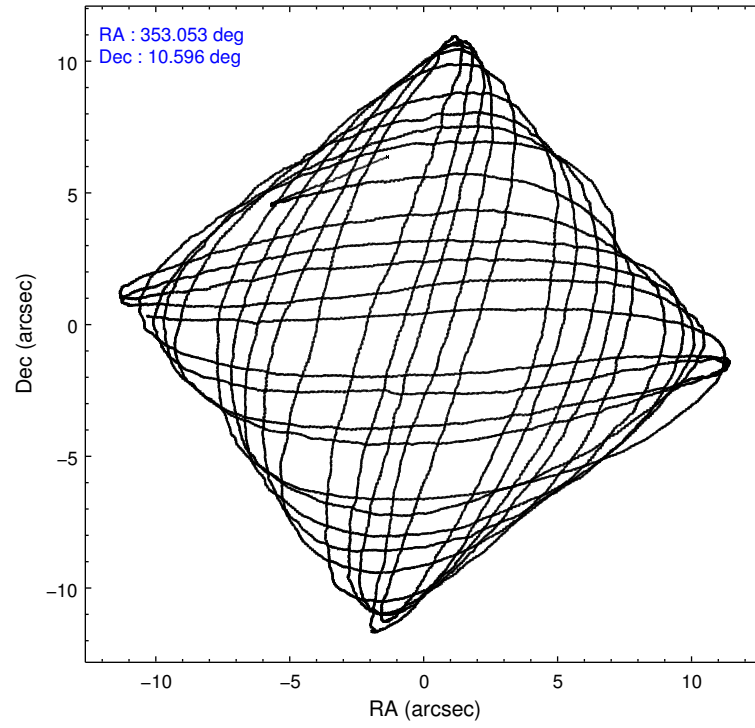
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 7
grade 0 events	2858	4410	2856	6211	3192
	4%	6%	3%	7%	3%
grade 1 events	37	55	35	66	105
	0%	0%	0%	0%	0%
grade 2 events	1962	2183	1832	1649	8667
	2%	2%	2%	2%	8%
grade 3 events	882	741	825	779	3027
	1%	1%	1%	0%	3%
grade 4 events	783	834	754	788	3066
	1%	1%	0%	0%	3%
grade 5 events	2979	3280	2801	3637	9229
	4%	4%	3%	4%	9%
grade 6 events	1774	2143	1482	1718	22894
	2%	2%	1%	2%	23%
grade 7 events	59288	59524	65736	64446	46748
	84%	81%	86%	81%	48%

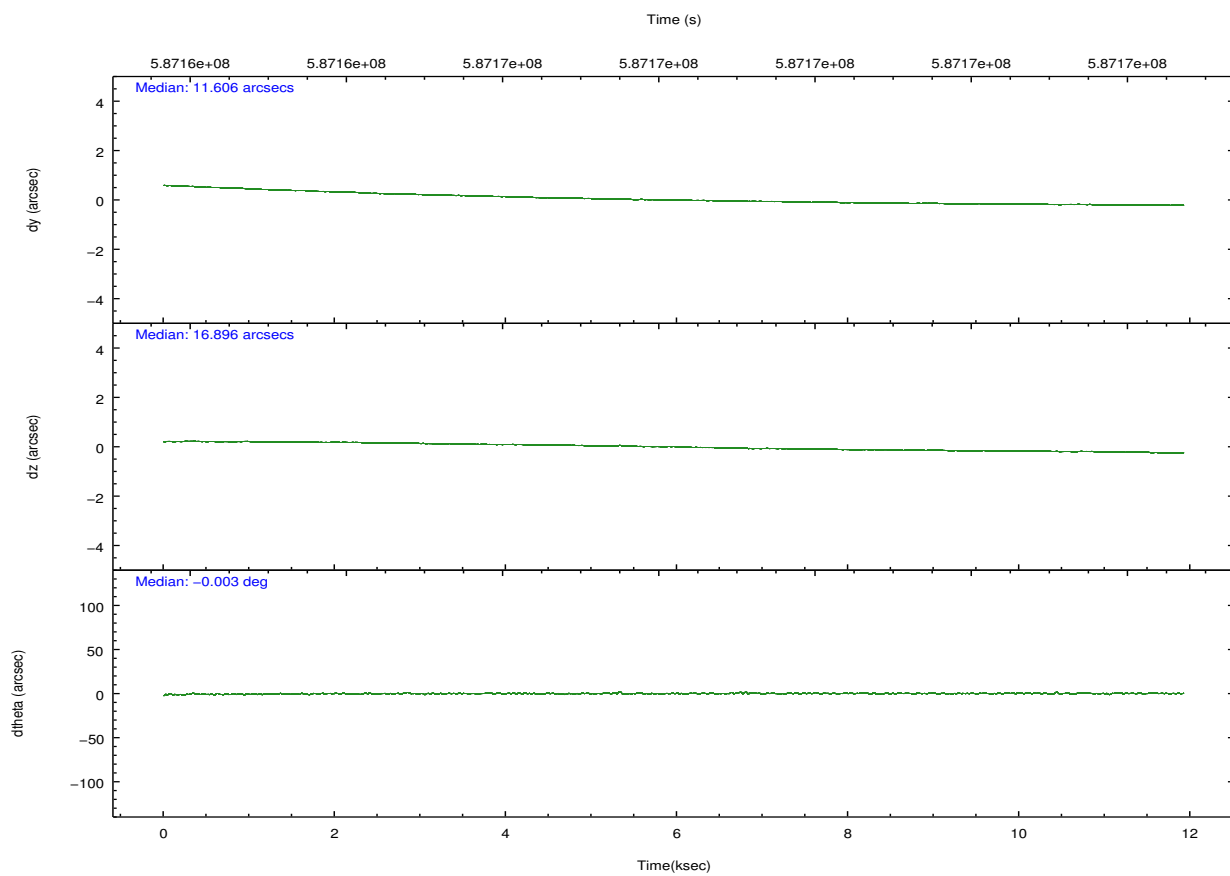
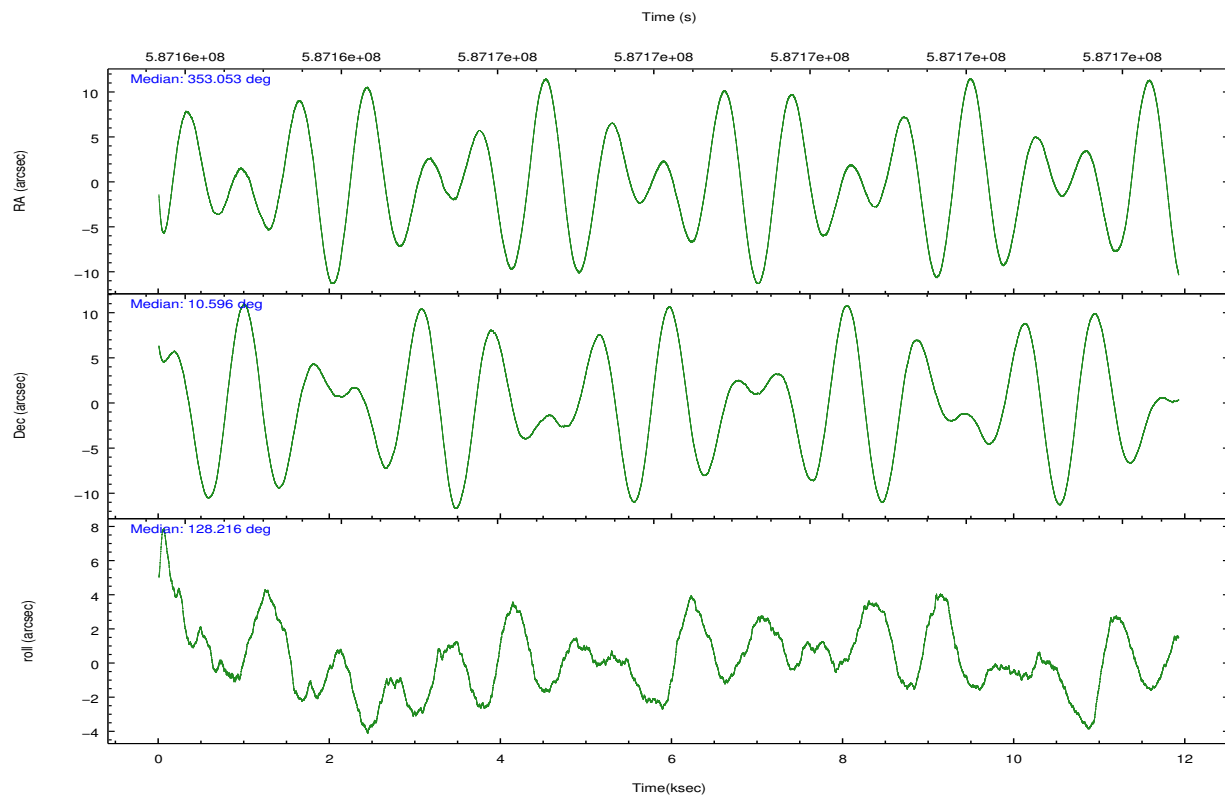


## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-01237	ACIS-01237	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	353.078870	353.0527807956057	CCD I2 on	Y	Y
[deg] Pointing Dec	10.585501	10.59565084727988	CCD I3 on	Y	Y
[deg] Pointing Roll	128.006944	128.2204226011226	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	N	N
[mm] SIM translation stage pos	-233.592463	-233.5874344608287	CCD S3 on	O1	Y
[mm] SIM translation stage offset	0	-0.005018542100998502	CCD S4 on	N	N
[s] Observation start time (MET)	587162420.184000	587161344.52035	CCD S5 on	N	N
Observation start date	2016-08-09T20:39:12	2016-08-09T20:22:24	Number of optional ACIS chips dropped	0	0
[s] Observation end time (MET)	587174169.184000	587174403.0211	On-chip summing requested	N	N
Observation end date	2016-08-09T23:55:01	2016-08-10T00:00:03	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

## 2.3 Aspect



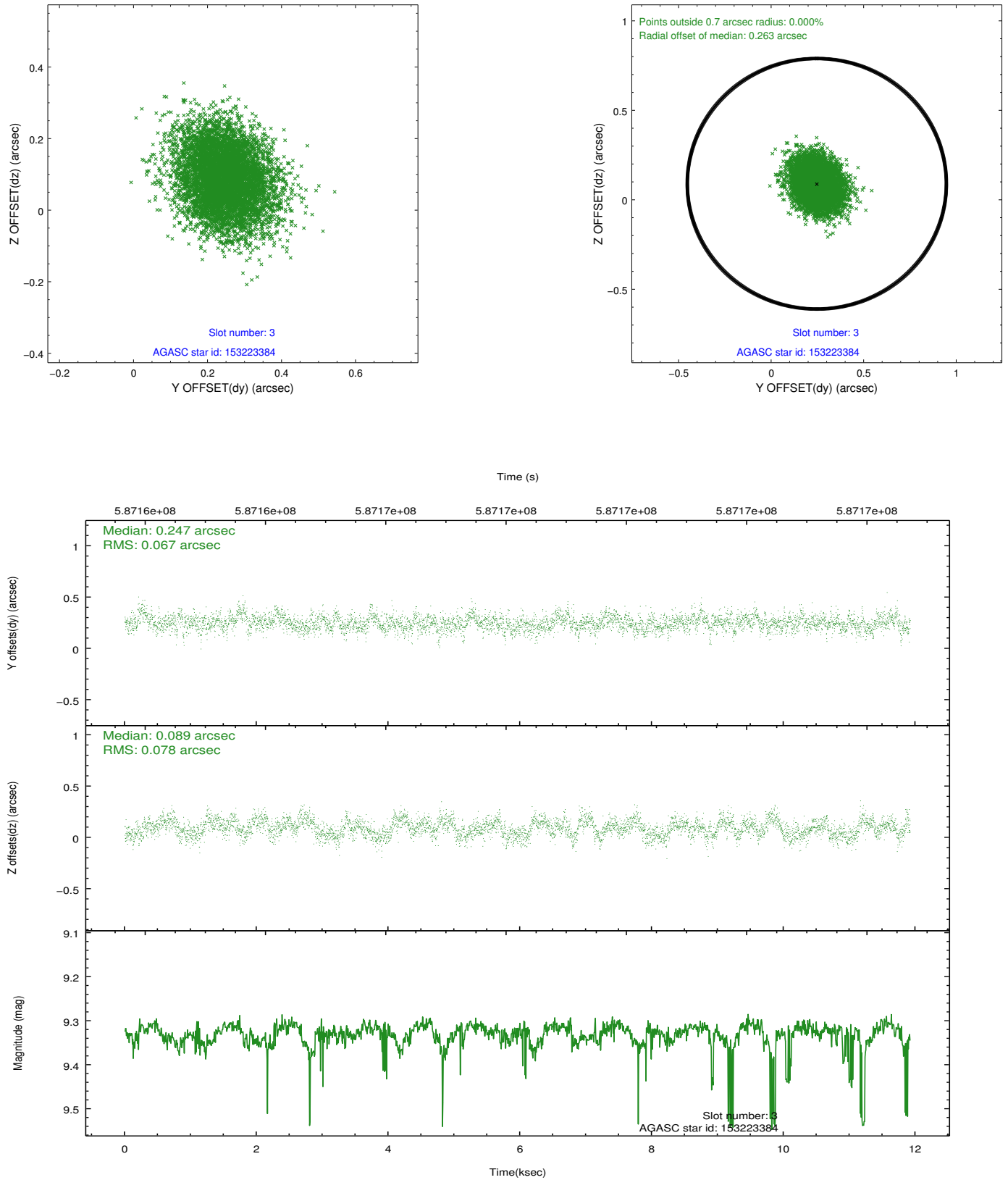


### Slot Statistics

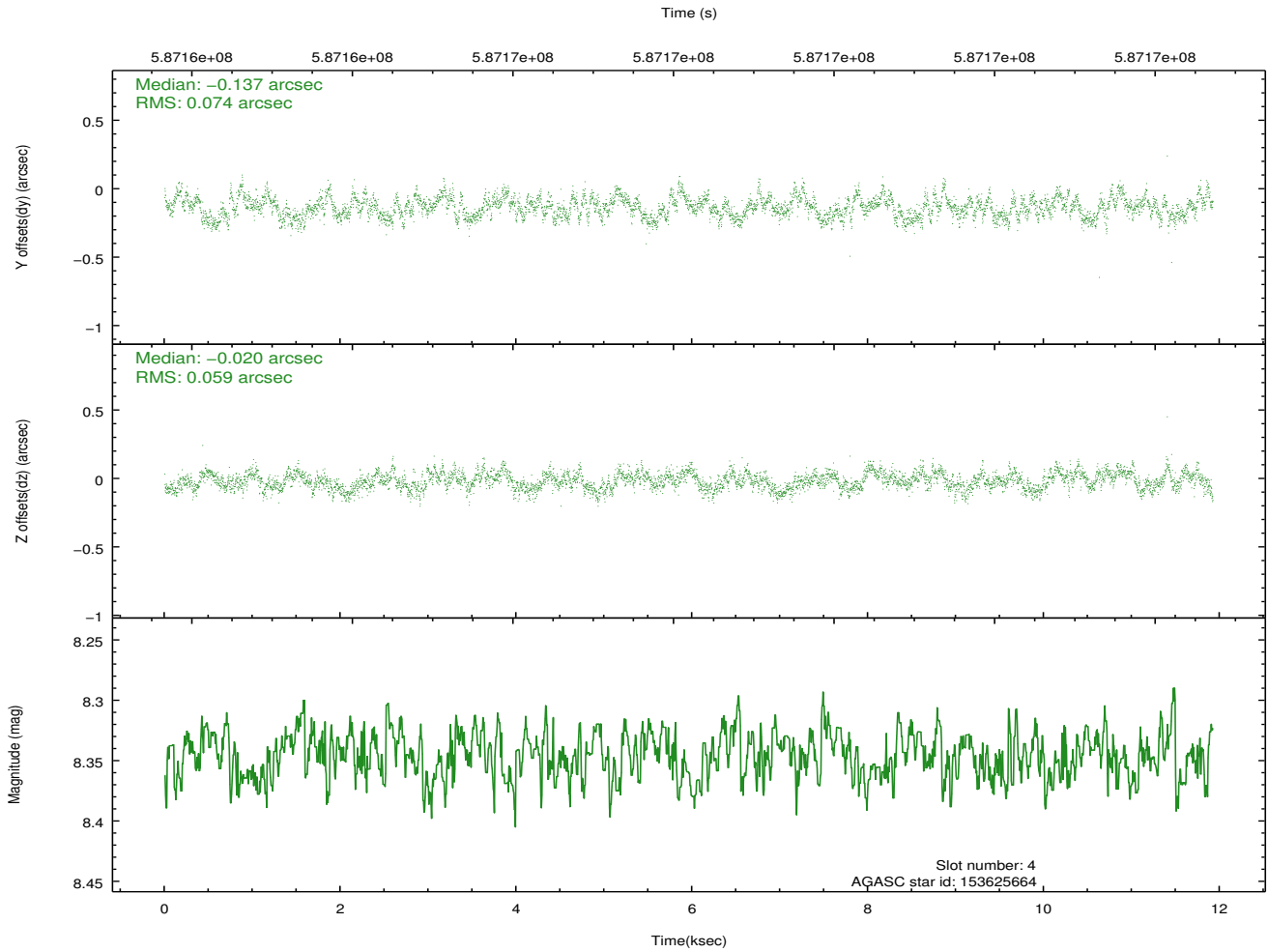
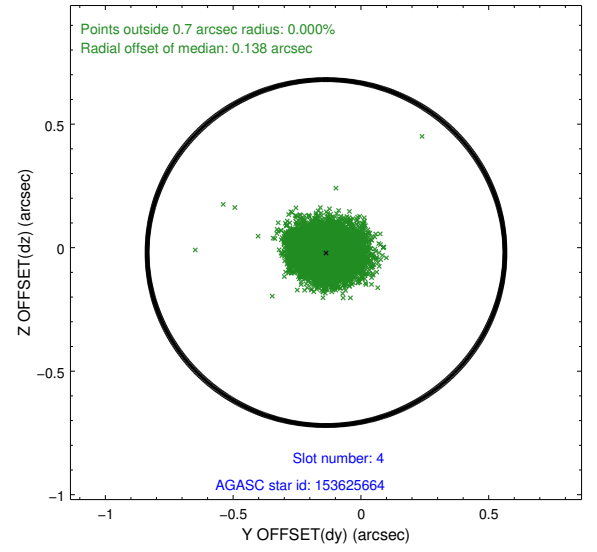
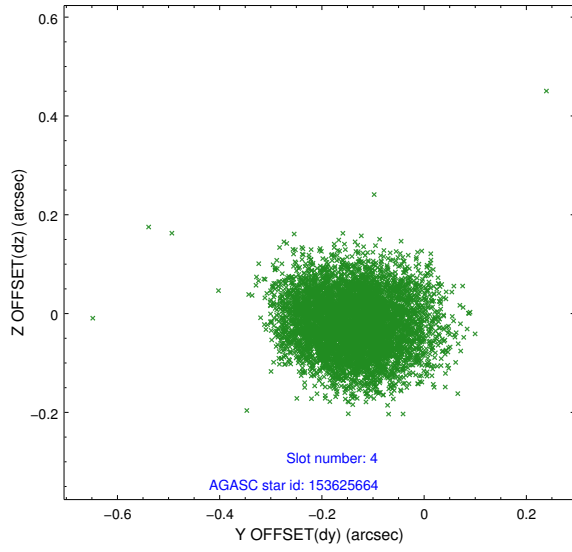
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-I-1	7.23	2908	0.093	-0.082	0.010	0.017	0.000000	0.000000	927.99	-840.61
1	FID		ACIS-I-5	7.23	2908	-0.315	0.058	0.006	0.011	0.000000	0.000000	-1820.32	1056.76
2	FID		ACIS-I-6	7.23	2908	0.131	0.095	0.010	0.015	0.000000	0.000000	393.07	1701.81
3	GUIDE	used	153223384	9.33	5812	0.247	0.089	0.109	0.179	353.114717	9.844425	-2180.34	1543.21
4	GUIDE	used	153625664	8.35	5816	-0.137	-0.020	0.102	0.157	353.089002	11.177992	1658.39	-1341.13
5	GUIDE	used	153627160	9.04	5815	0.384	0.499	0.124	0.198	353.430459	10.649217	-584.00	-1120.79
6	GUIDE	used	153631280	8.46	5813	-0.343	-0.417	0.101	0.163	352.492330	10.254793	342.21	2368.56
7	GUIDE	used	152702320	9.47	5811	-0.152	-0.152	0.176	0.268	352.196153	10.752346	2396.15	2088.03

## 2.4 Star Slots

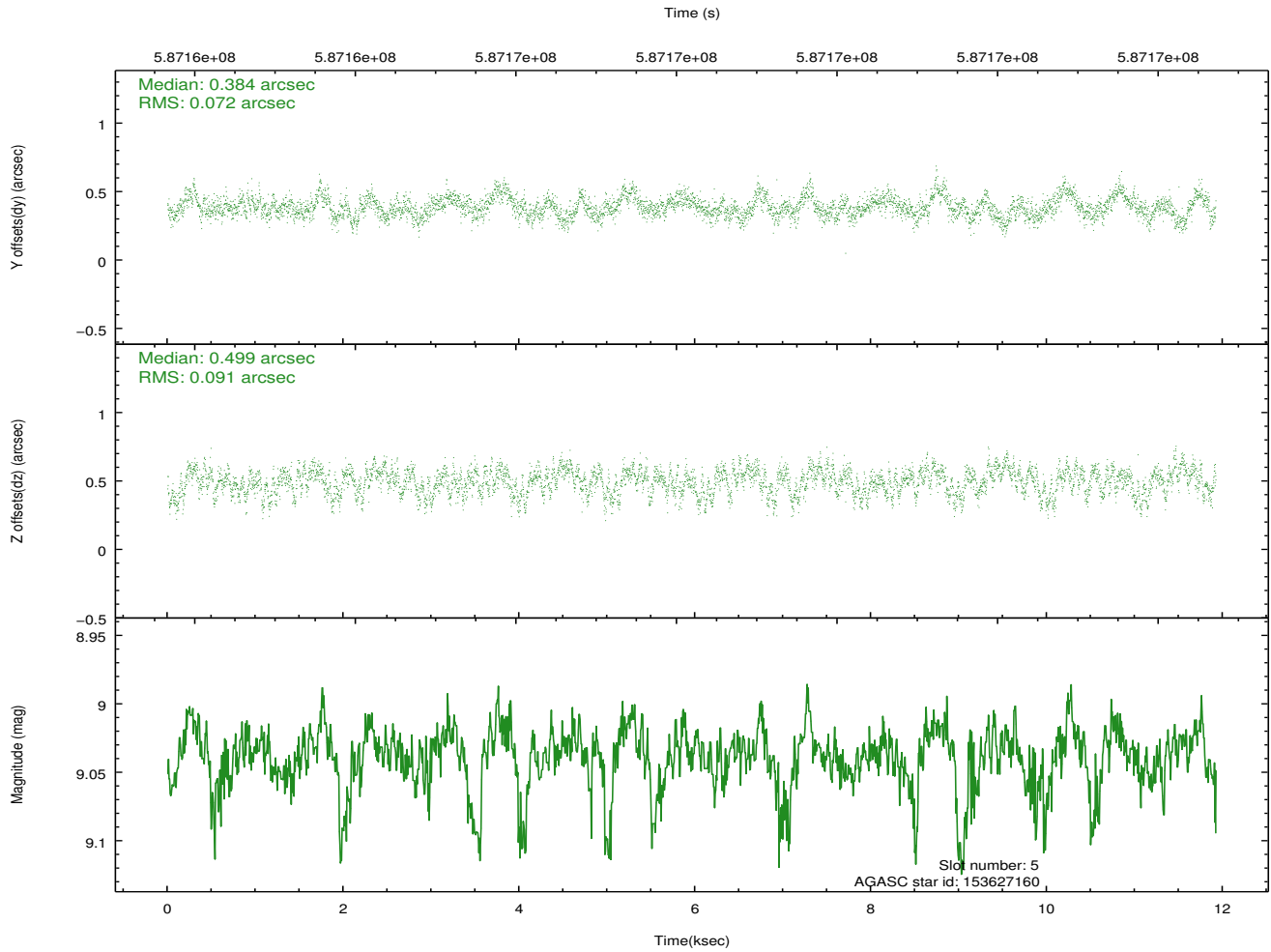
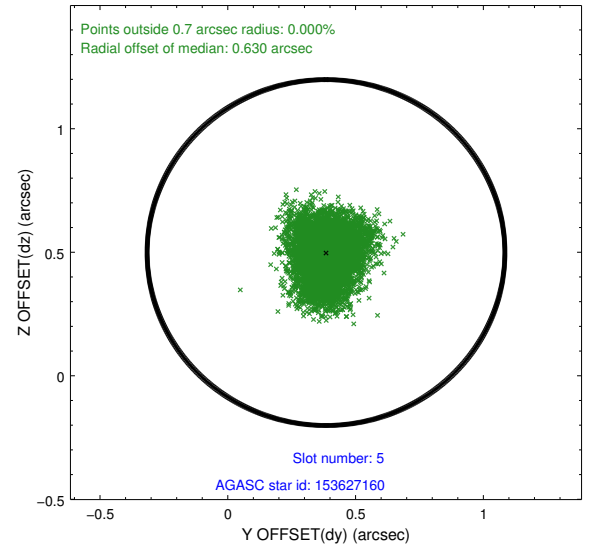
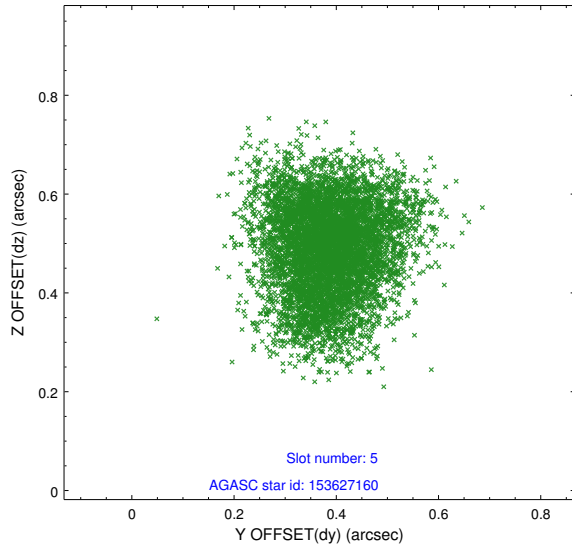
### 2.4.1 Slot 3



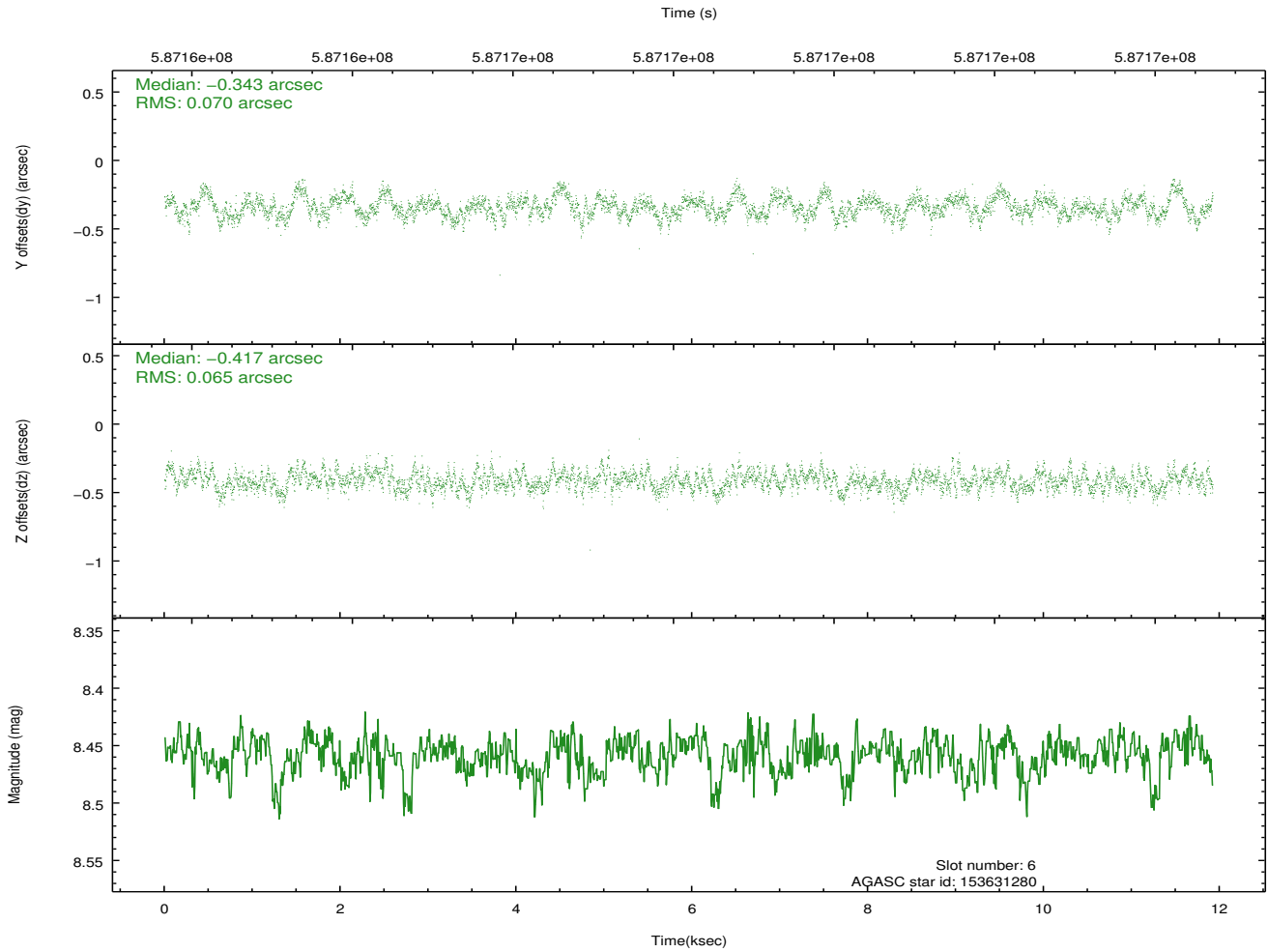
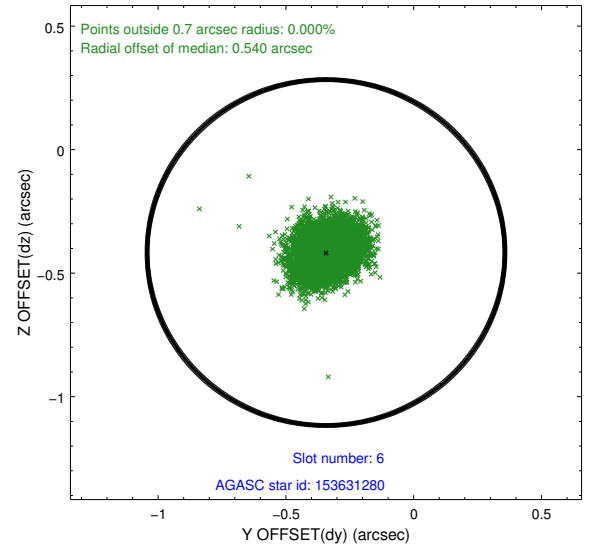
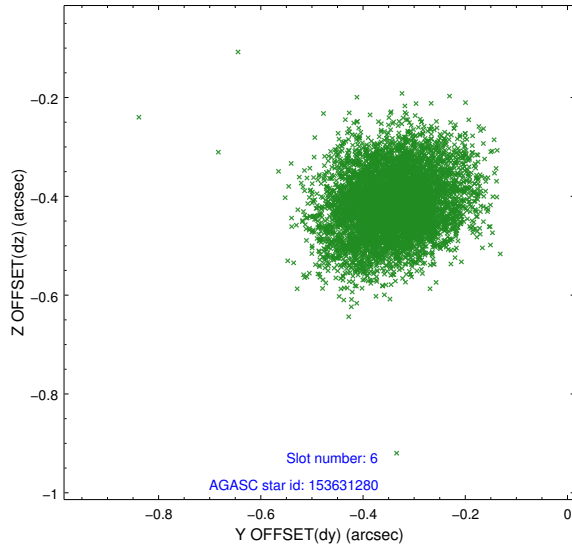
## 2.4.2 Slot 4



### 2.4.3 Slot 5

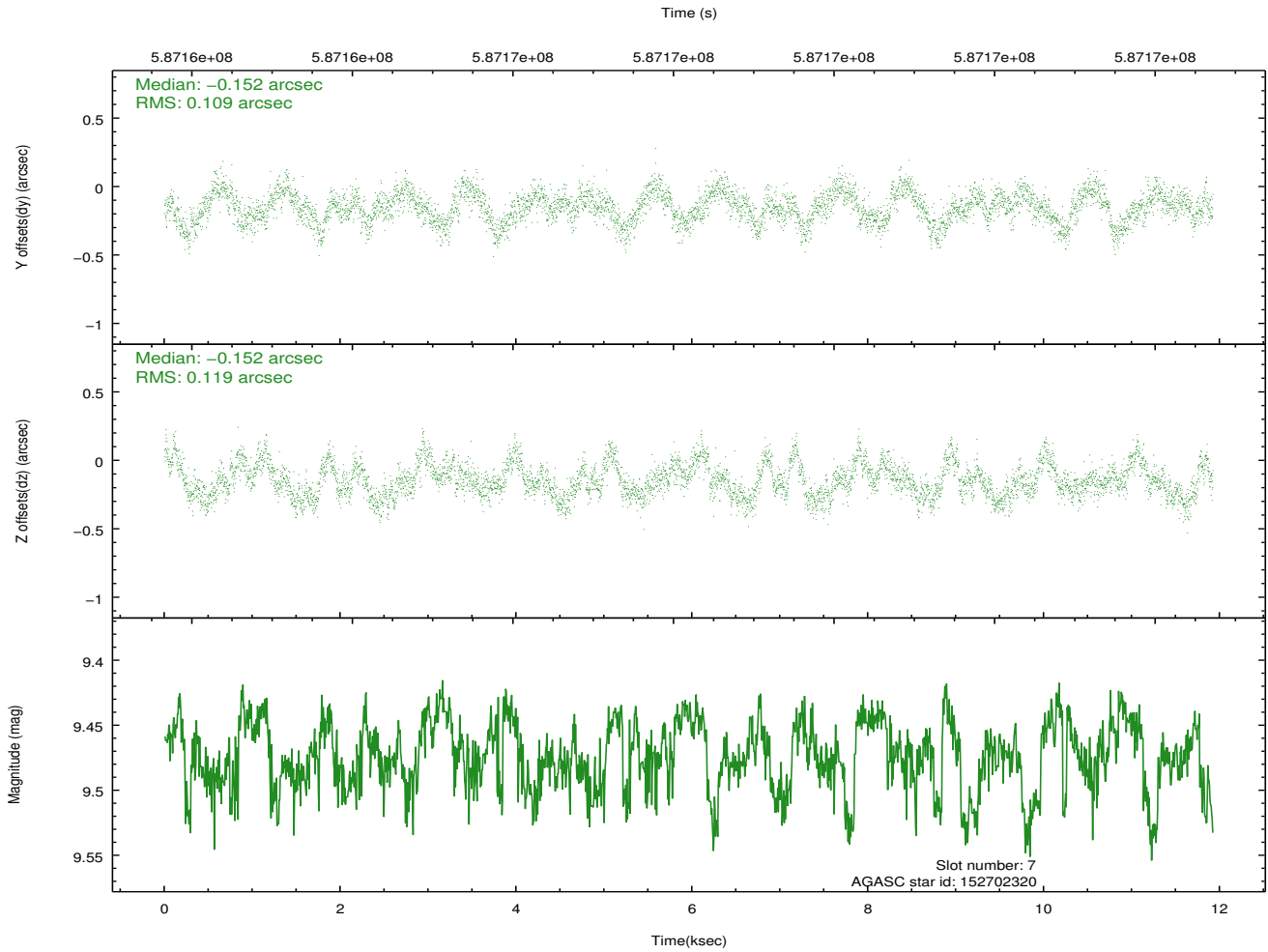
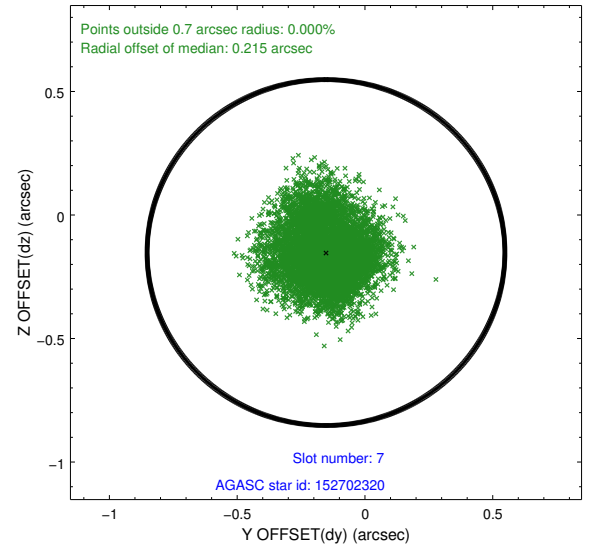
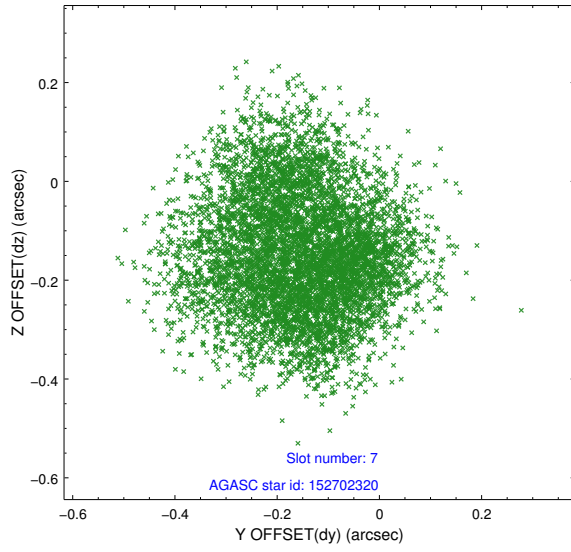


## 2.4.4 Slot 6



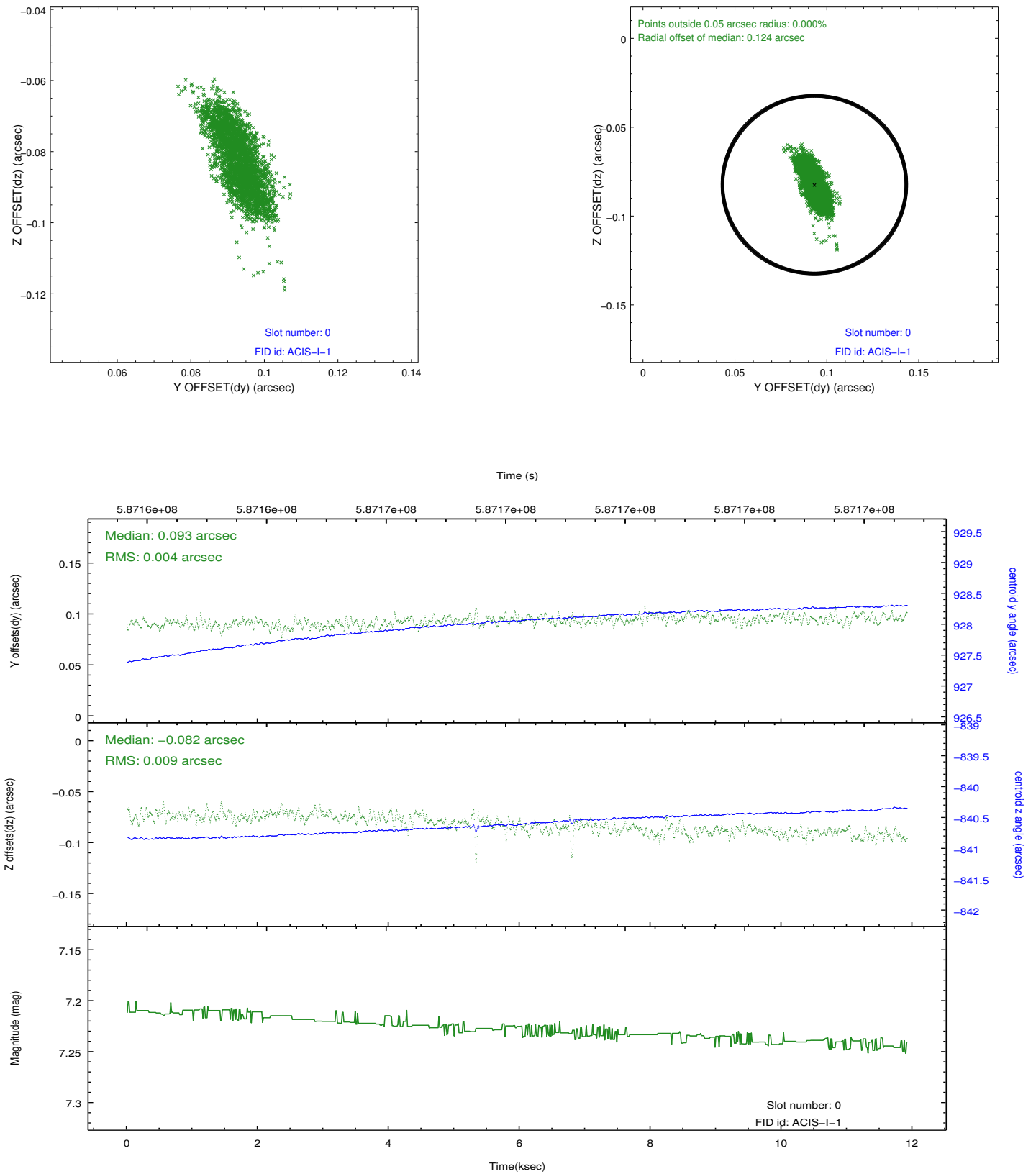


## 2.4.5 Slot 7

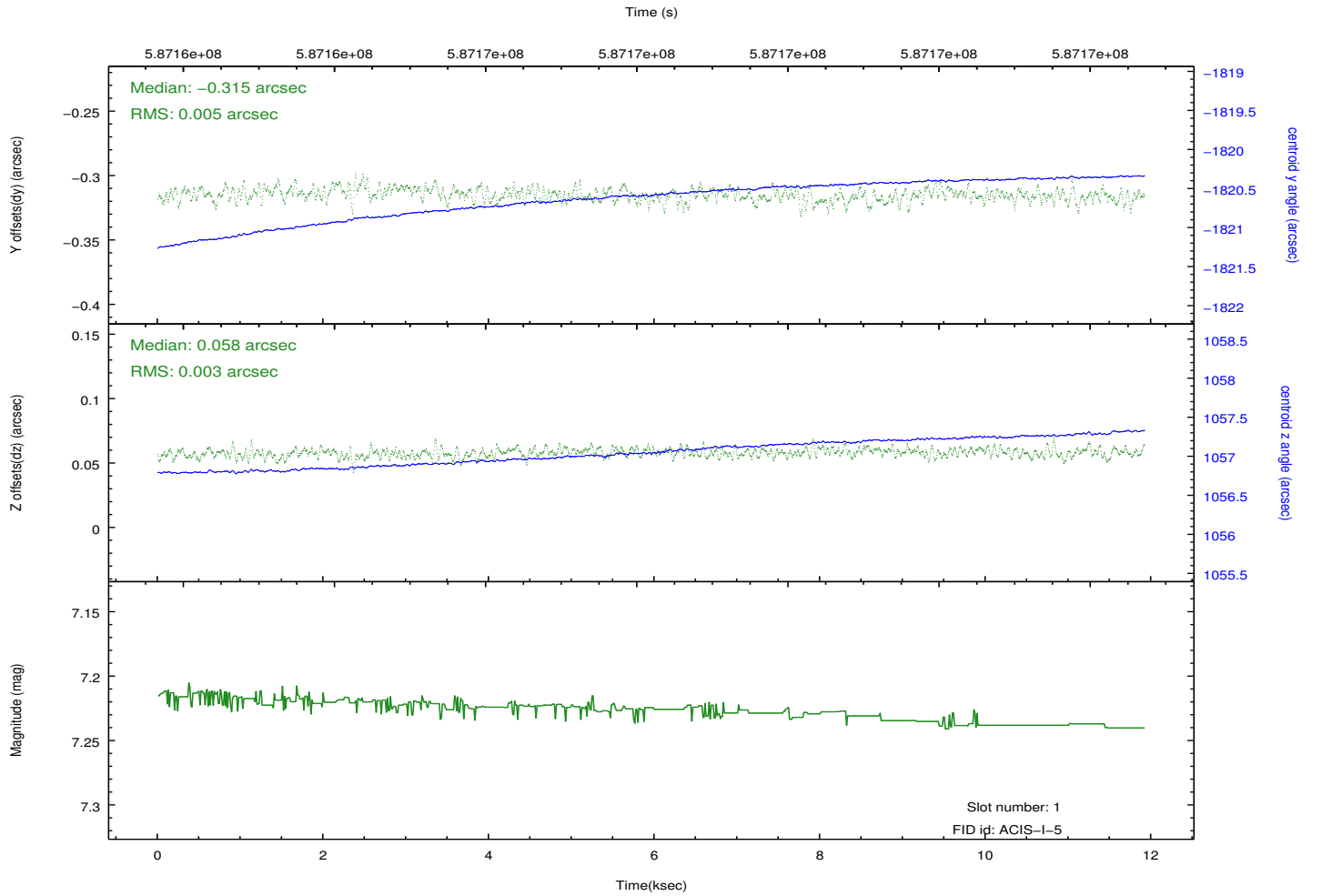
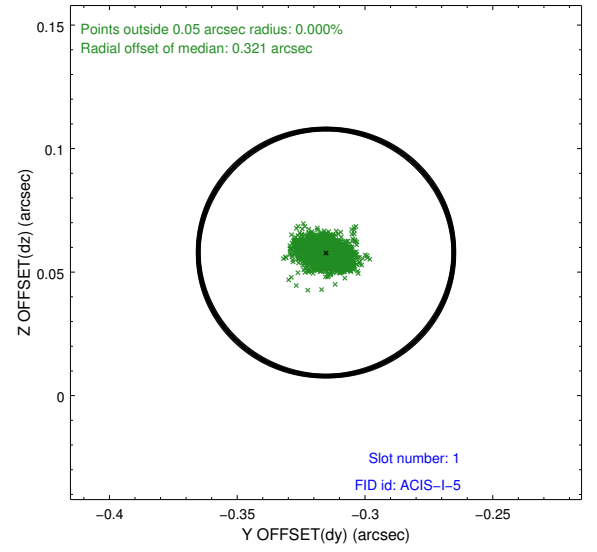
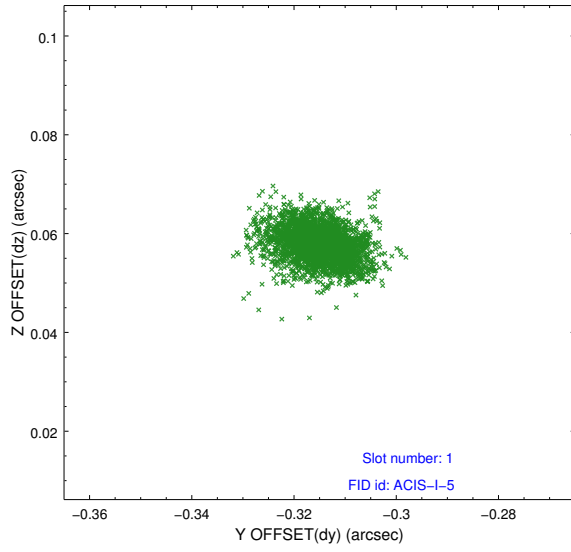


## 2.5 FID Slots

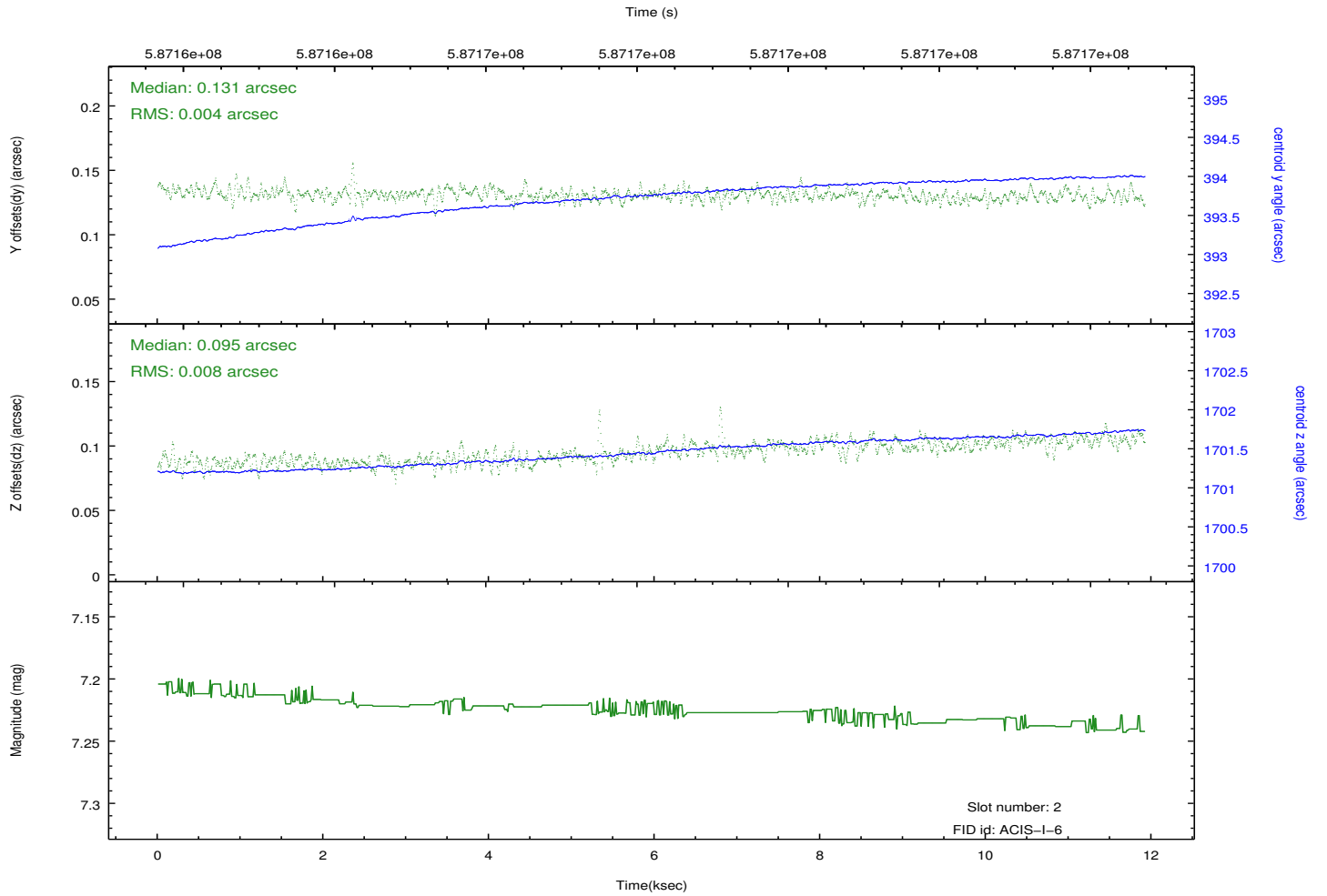
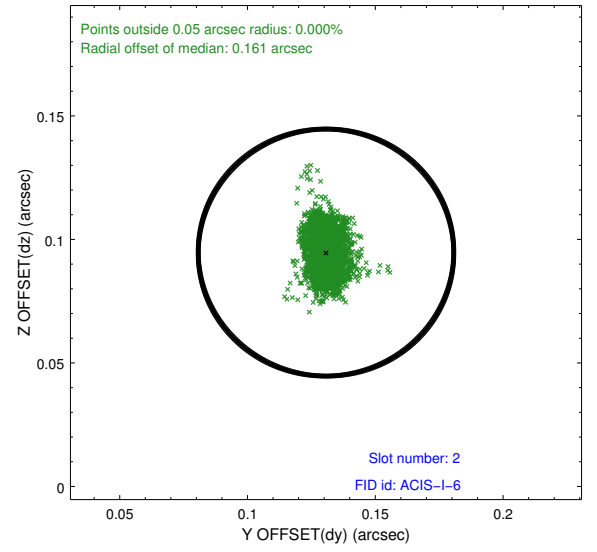
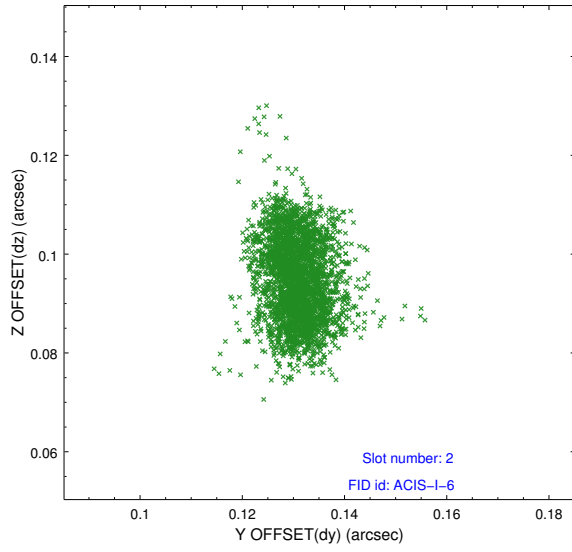
### 2.5.1 Slot 0



## 2.5.2 Slot 1



### 2.5.3 Slot 2



# A Summary

## A.1 Status

V&V Scientist	Beth Sundheim
V&V Date (YYYY-MM-DD)	2018.03.07
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	11.807900090933

## A.2 Comments

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., -114.0 C for ACIS-I and -112.0 C for ACIS-S).

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.