

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 1774 - L2 Version 5  
Chandra X-Ray Center

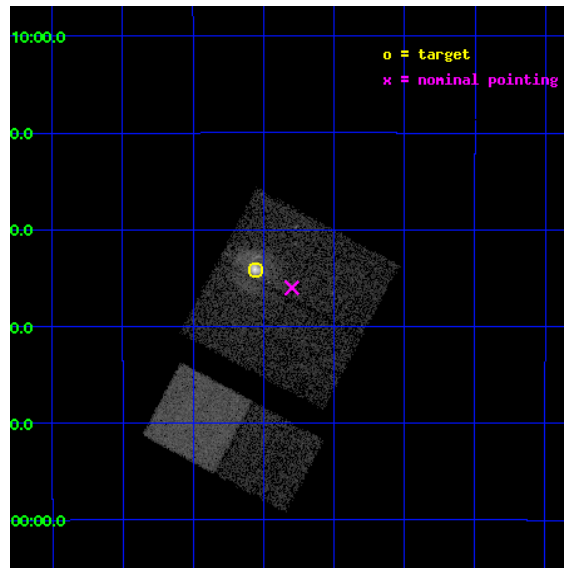
L2 Processing Date : Aug 30 2012

## 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	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

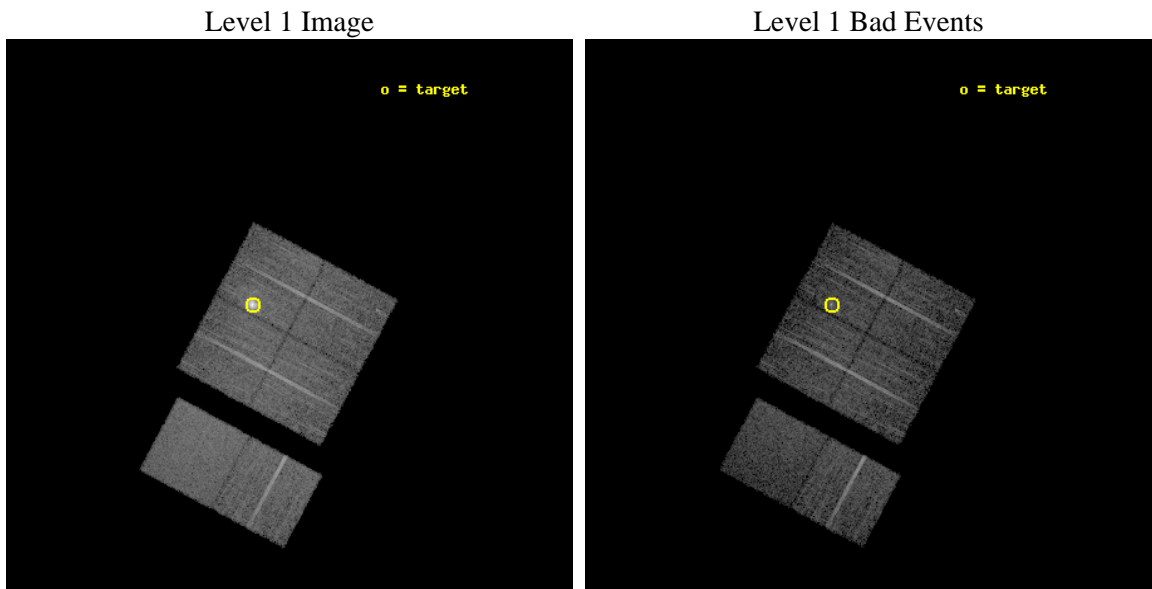
seq_num	590200	Sequence number
obs_id	1774	Observation id
title	HRC RESPONSE TO CONTINUUM SOURCE.	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	G21.5-0.9 [Chip I1, T=110, Offsets=-4,0,-1]	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	278.389583	Observer's specified target RA [deg]
dec_targ	-10.568528	Observer's specified target Dec [deg]
ra_nom	278.32461024614	Nominal RA [deg]
dec_nom	-10.600209981021	Nominal Dec [deg]
roll_nom	208.12099345849	Nominal Roll [deg]
revision	5	Processing version of data
ontime	7318.4000068009	Sum of GTIs [s]
liveltime	7225.7300193033	Livetime [s]
ontime0	7318.4000068009	Sum of GTIs [s]
ontime1	7318.4000068009	Sum of GTIs [s]
ontime2	7318.4000068009	Sum of GTIs [s]
ontime3	7318.4000068009	Sum of GTIs [s]
ontime6	7318.4000068009	Sum of GTIs [s]
ontime7	7318.4000068009	Sum of GTIs [s]
l2events	64422	Number of level 2 events



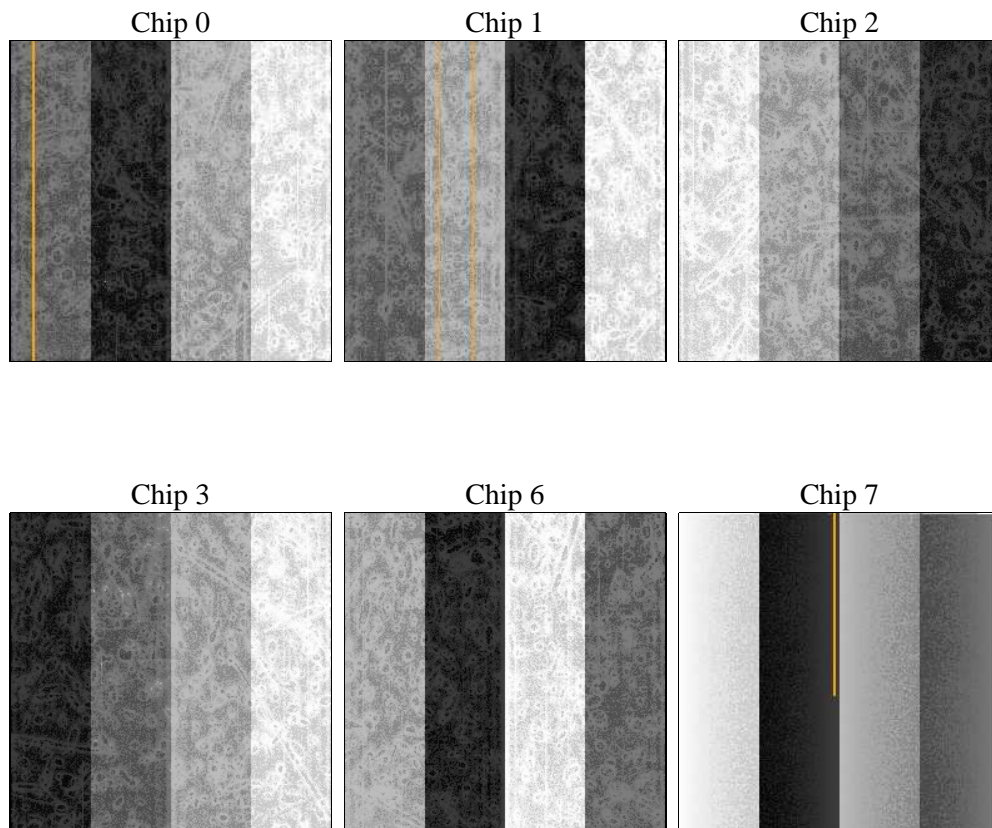
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	7560.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	7318.4000068009	Sum of GTIs [s]
caldsver	4.5.1.1	&#160	ontime0	7318.4000068009	Sum of GTIs [s]
date	2012-08-30T03:41:47	Date and time of file creation	ontime1	7318.4000068009	Sum of GTIs [s]
revision	5	Processing version of data	ontime2	7318.4000068009	Sum of GTIs [s]
			ontime3	7318.4000068009	Sum of GTIs [s]
			ontime6	7318.4000068009	Sum of GTIs [s]
			ontime7	7318.4000068009	Sum of GTIs [s]
			l1events	329760	Number of level 1 events

### 2.1.4 Events

	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7		ccd 0	ccd 1	ccd 2	ccd 3	ccd 6	ccd 7
level 1 events	45704	69973	52181	51755	53929	56218	grade 0 events	1364	14810	1135	1905	990	1223
rejected events	40284	42940	47242	45378	48648	35073		2%	21%	2%	3%	1%	2%
rejected %	88%	61%	90%	87%	90%	62%	grade 1 events	9	124	10	10	9	28
								0%	0%	0%	0%	0%	0%
							grade 2 events	2109	7049	1993	2375	2136	4514
								4%	10%	3%	4%	3%	8%
							grade 3 events	342	1154	318	377	341	1276
								0%	1%	0%	0%	0%	2%
							grade 4 events	343	1199	333	338	345	1170
								0%	1%	0%	0%	0%	2%
							grade 5 events	995	1242	935	1052	1168	3302
								2%	1%	1%	2%	2%	5%
							grade 6 events	1271	2842	1166	1385	1472	12968
								2%	4%	2%	2%	2%	23%
							grade 7 events	39271	41553	46291	44313	47468	31737
								85%	59%	88%	85%	88%	56%

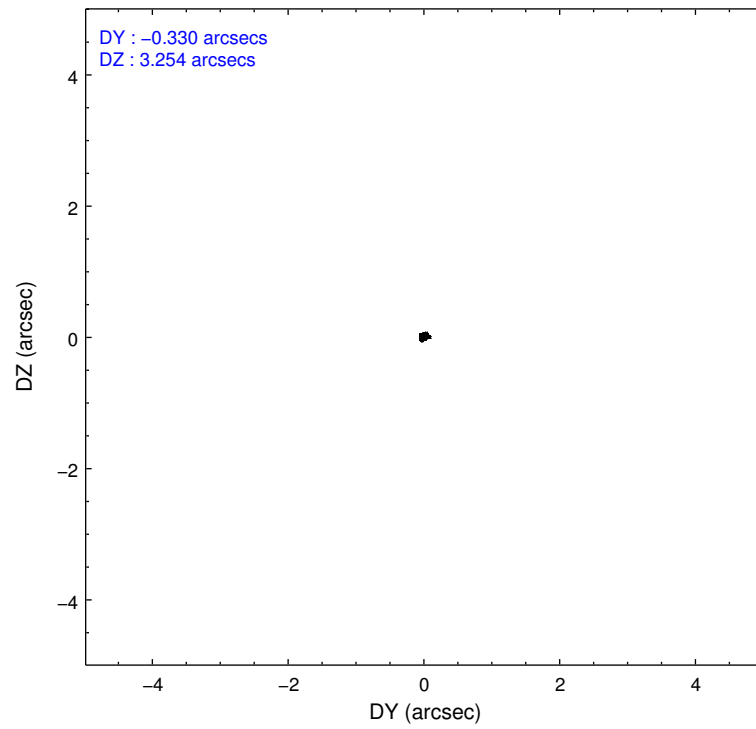
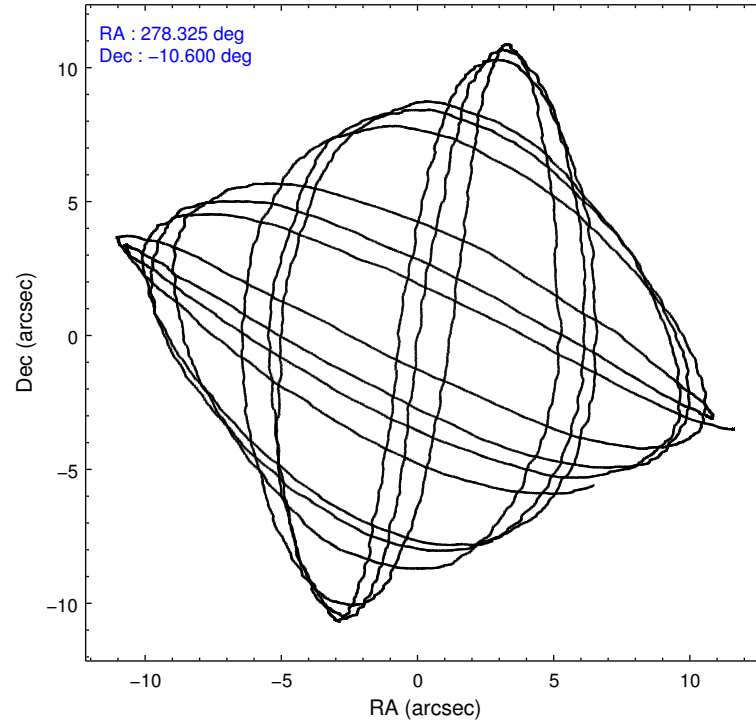


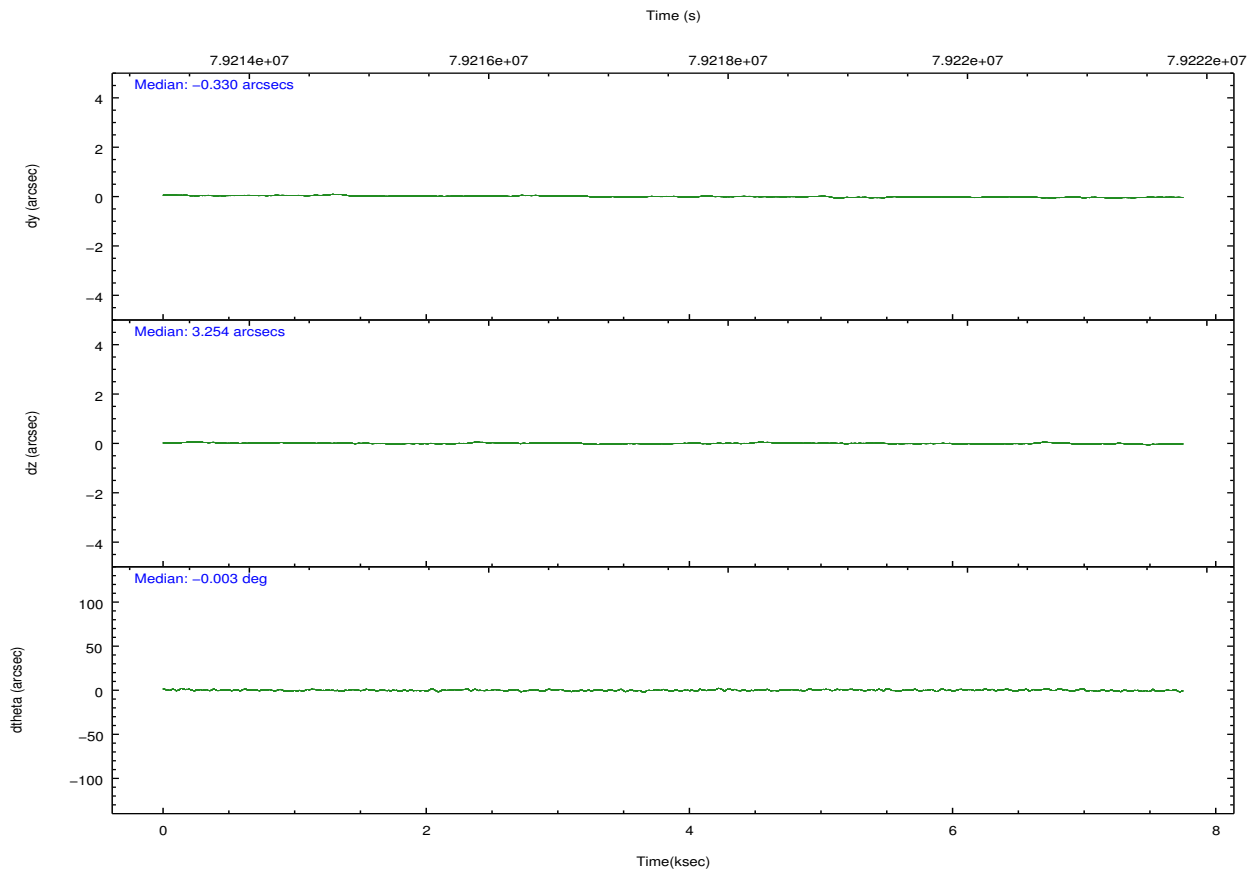
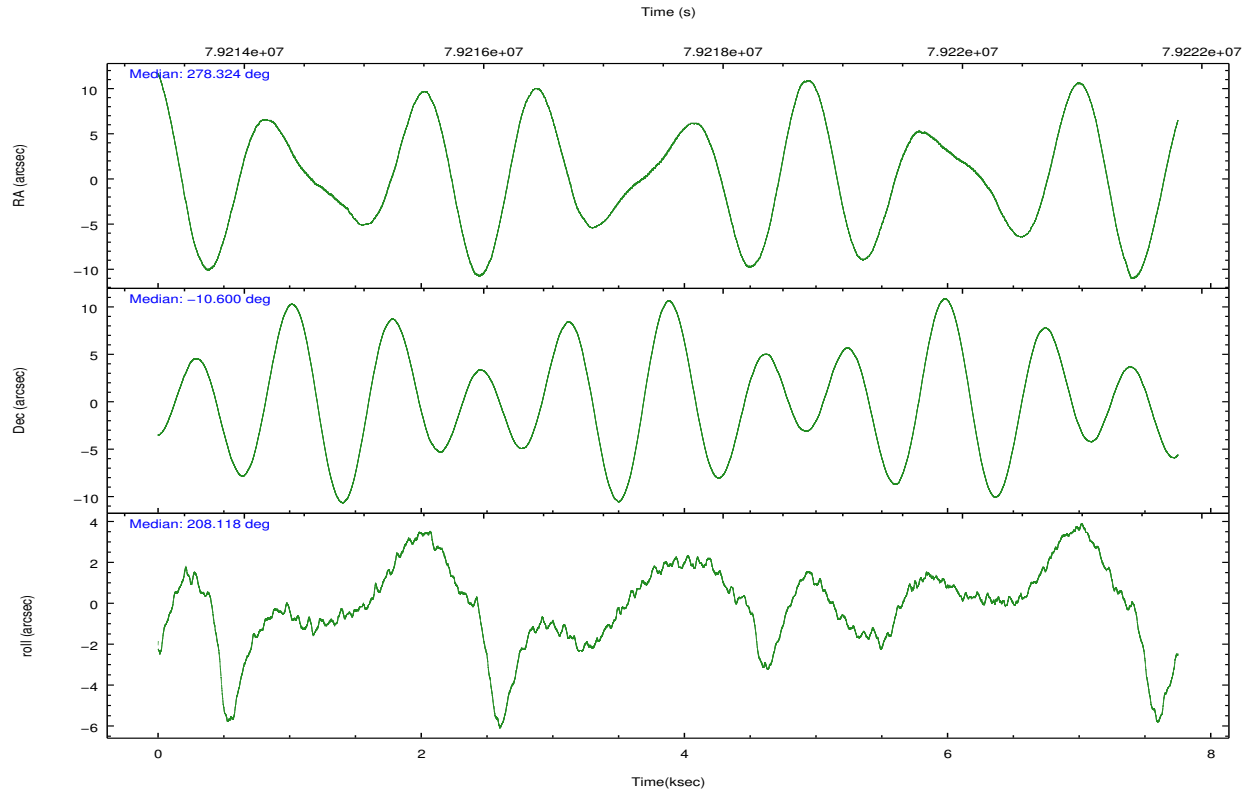
## 2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-012367	ACIS-012367
Grating	NONE	NONE
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	278.339576	278.3246102461412
[deg] Pointing Dec	-10.576848	-10.60020998102081
[deg] Pointing Roll	207.915043	208.1209934584898
[mm] SIM focus pos	-0.782348	-0.7809083437167272
[mm] SIM defocus	0	0.001439871863259334
[mm] SIM translation stage pos	-238.277263	-238.2741181829365
[mm] SIM translation stage offset	4.6848	4.681665180006831
[s] Observation start time (MET)	79213856.184000	79213479.717611
Observation start date	2000-07-05T19:49:52	2000-07-05T19:44:39
[s] Observation end time (MET)	79221416.184000	79221550.055408
Observation end date	2000-07-05T21:55:52	2000-07-05T21:59:10
Read mode	TIMED	TIMED

Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

## 2.3 Aspect



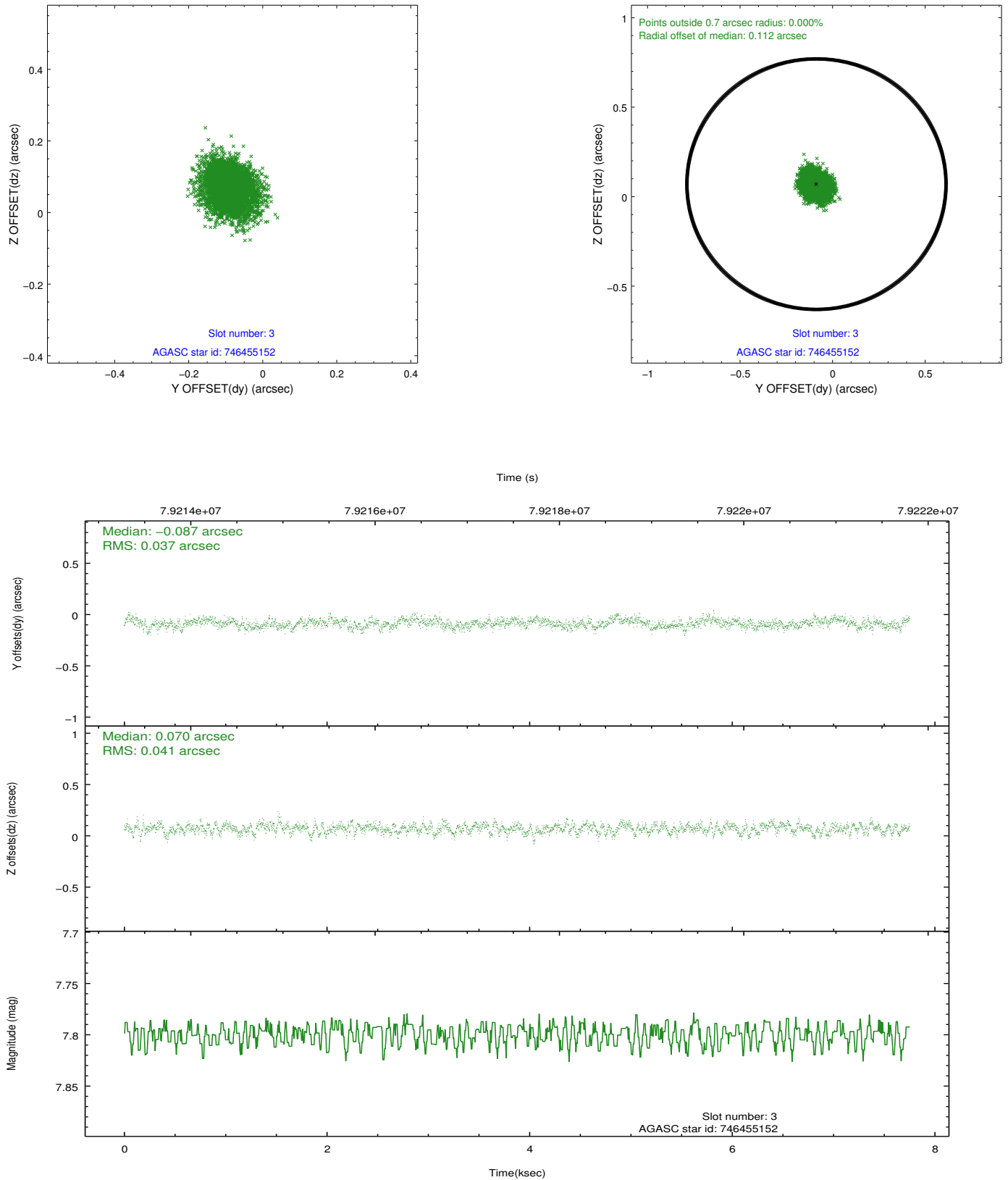


### Slot Statistics

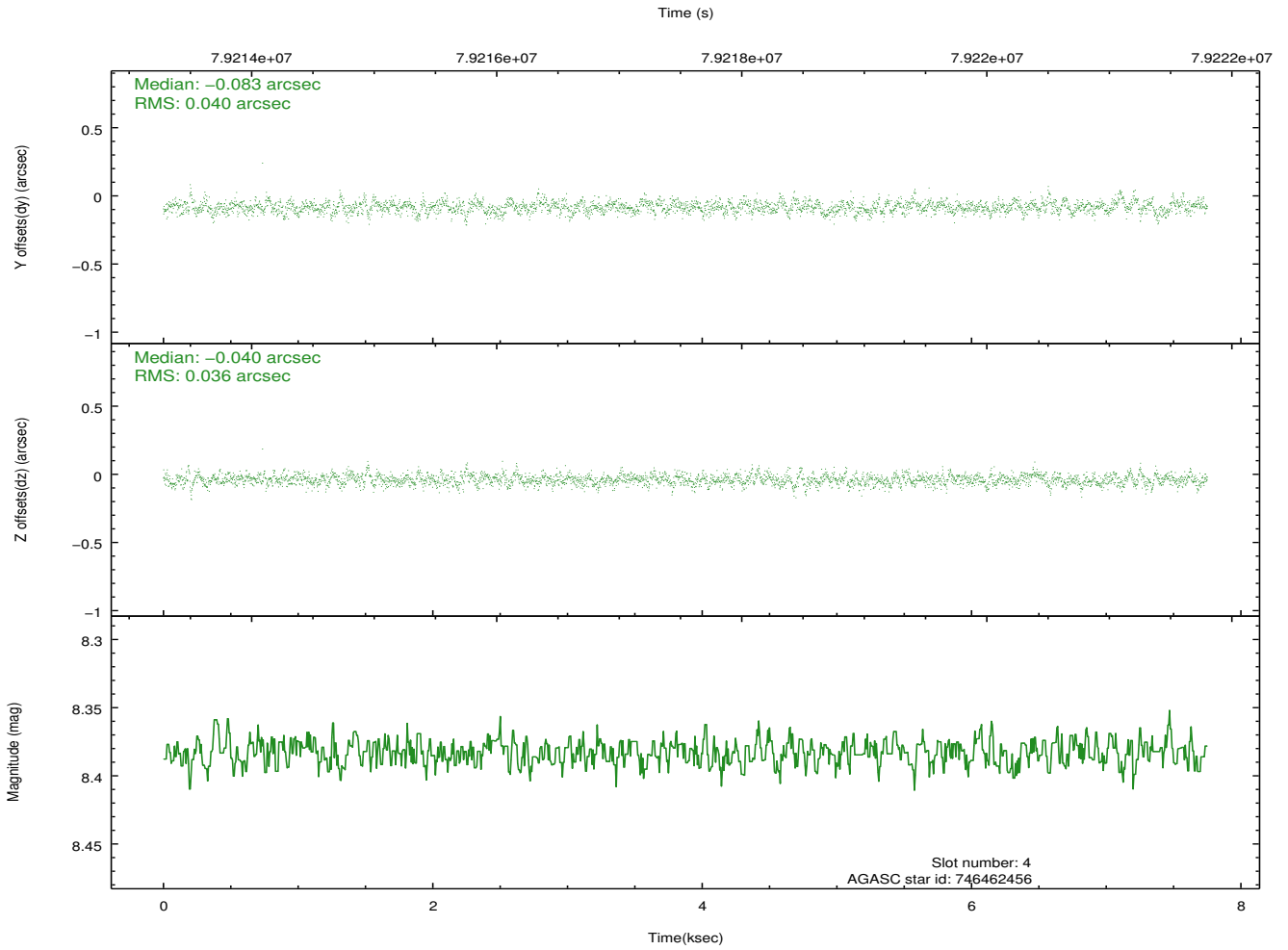
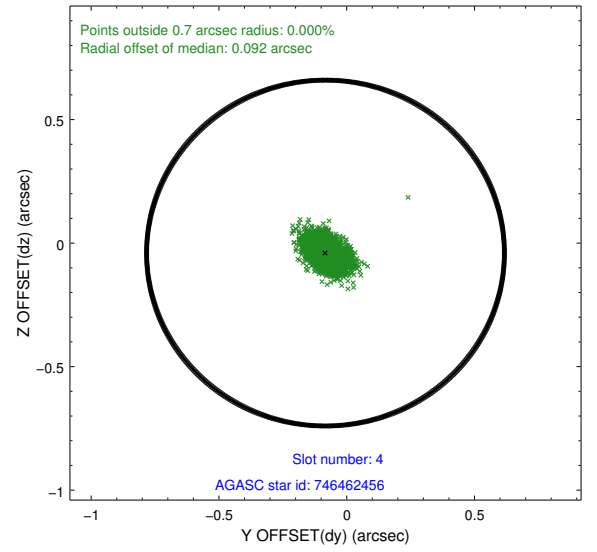
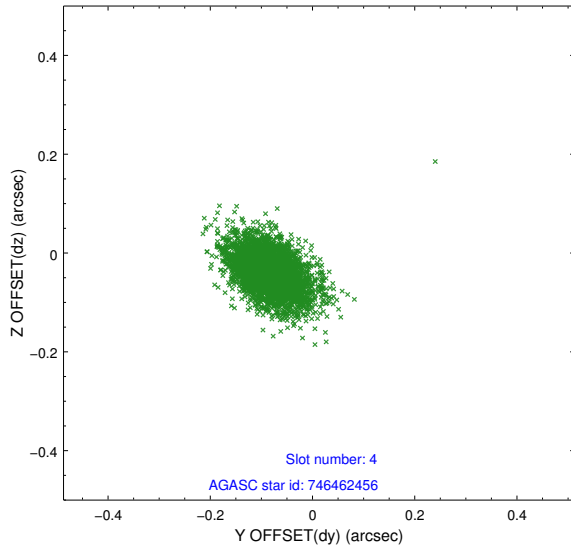
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-I-2	7.16	1889	-0.059	-0.072	0.012	0.019	0.000000	0.000000	-753.67	-737.35
1	FID	ACIS-I-4	7.20	1889	-0.017	0.059	0.009	0.015	0.000000	0.000000	2160.09	1168.73
2	FID	ACIS-I-5	7.24	1891	-0.022	0.081	0.010	0.016	0.000000	0.000000	-1806.80	1167.95
3	GUIDE	746455152	7.80	3781	-0.087	0.070	0.058	0.095	278.447893	-9.976732	-1351.01	-1728.42
4	GUIDE	746462456	8.38	3781	-0.083	-0.040	0.055	0.098	278.652171	-10.530173	-1056.71	370.29
5	GUIDE	746455112	8.93	3777	0.219	-0.111	0.071	0.119	278.266531	-10.703234	441.02	281.90
6	GUIDE	746460328	9.80	3781	0.036	0.025	0.094	0.153	278.603974	-9.898096	-1972.35	-1719.09
7	GUIDE	746995400	9.51	3778	-0.085	0.060	0.086	0.142	278.078957	-11.289885	2014.10	1838.40

## 2.4 Star Slots

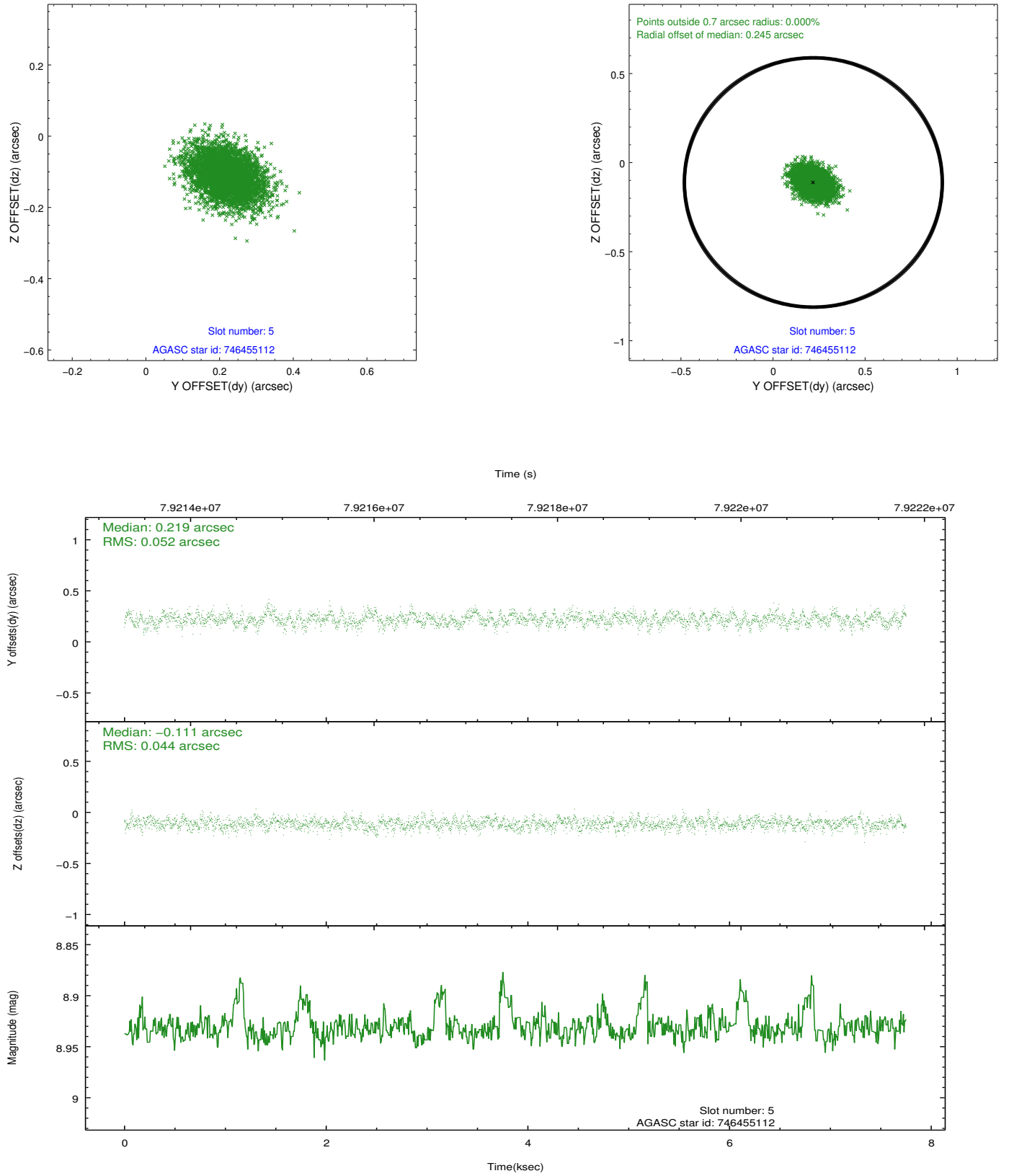
### 2.4.1 Slot 3



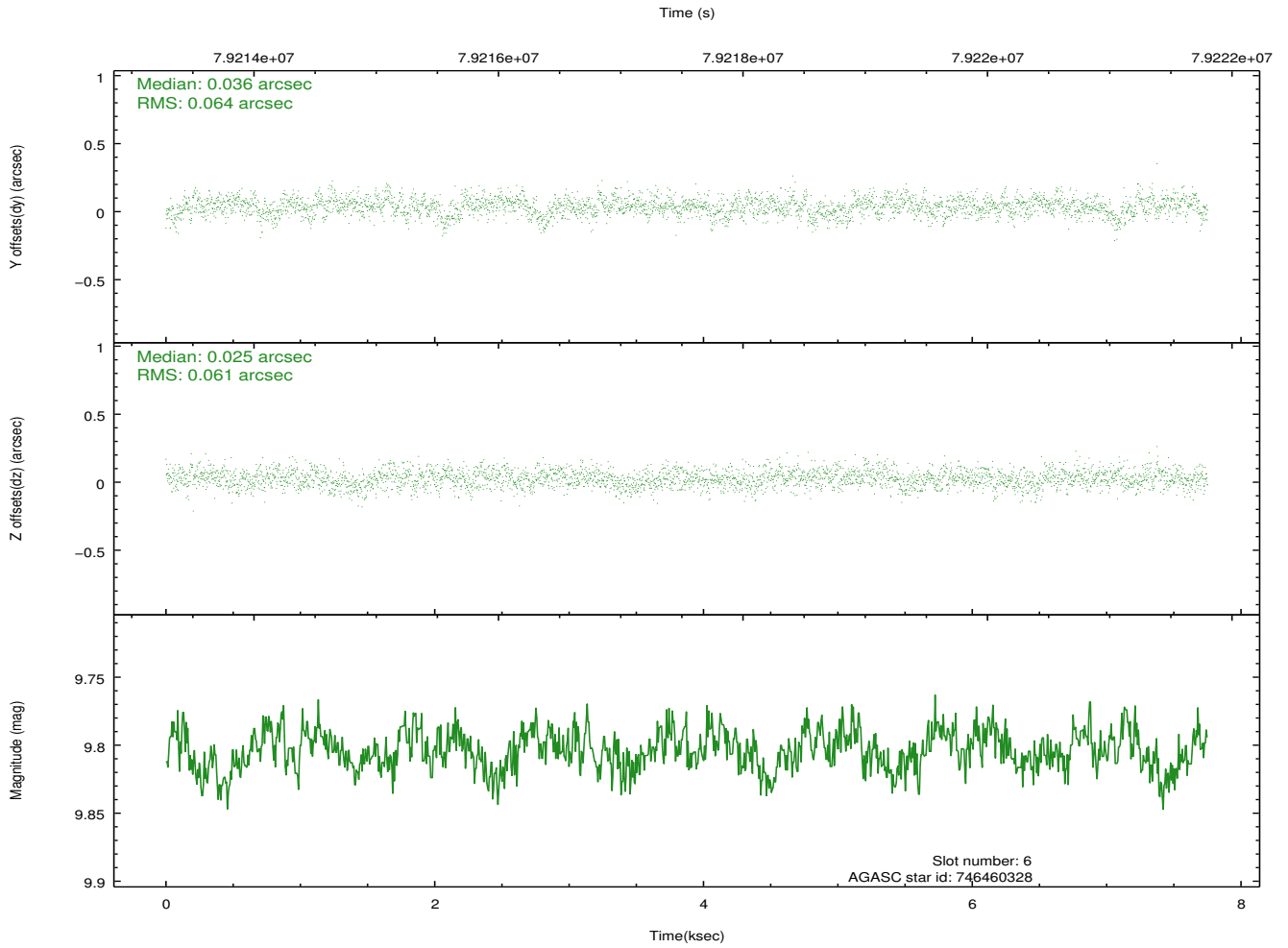
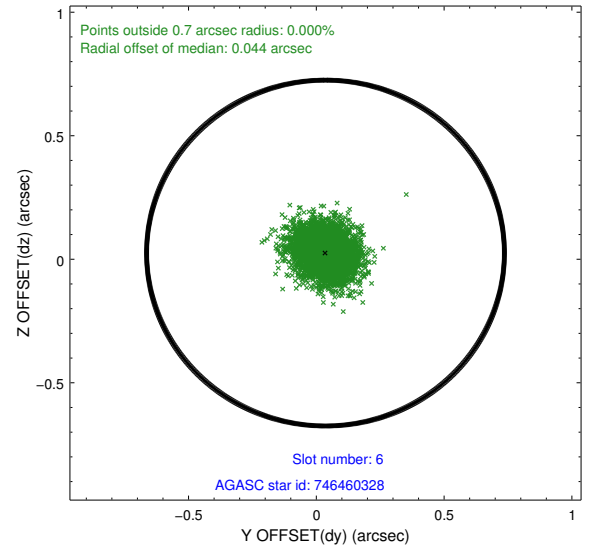
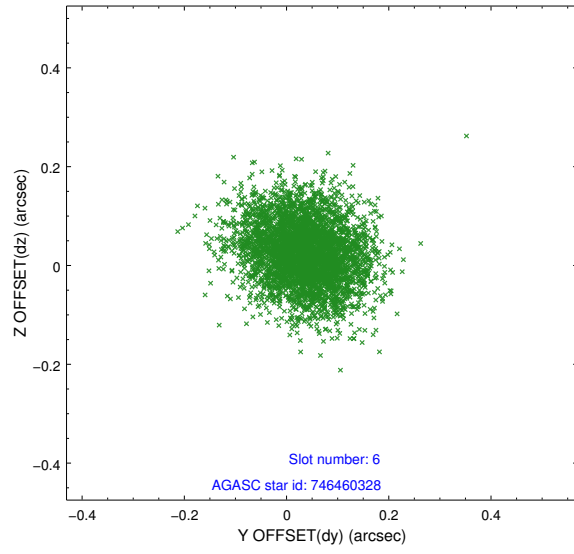
## 2.4.2 Slot 4



### 2.4.3 Slot 5

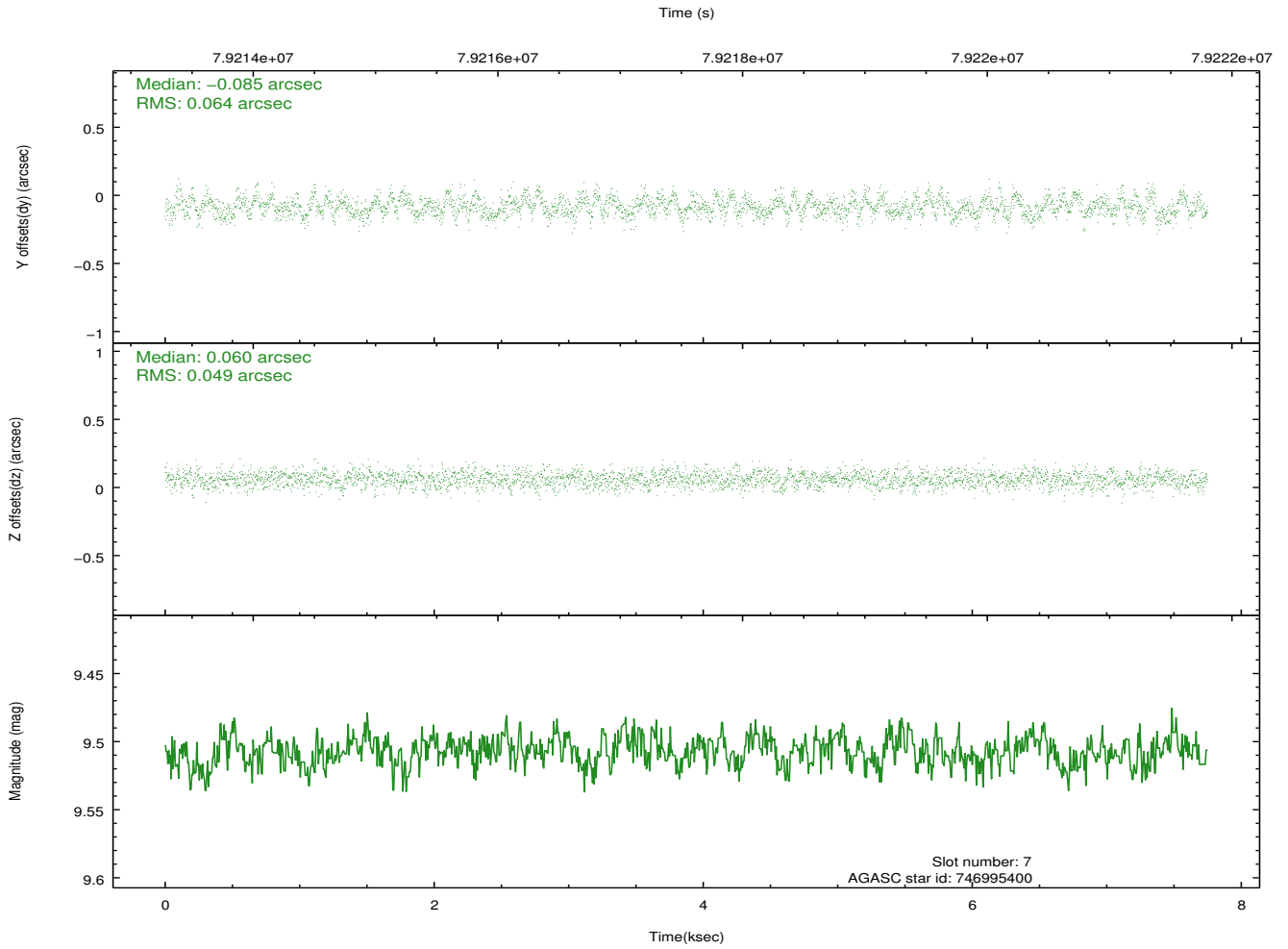
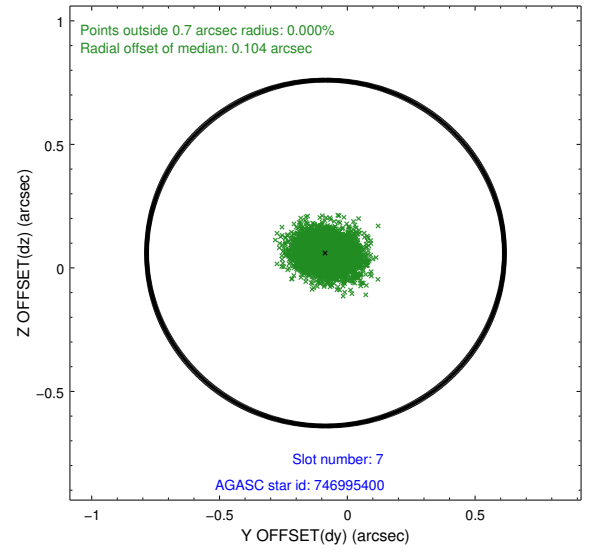
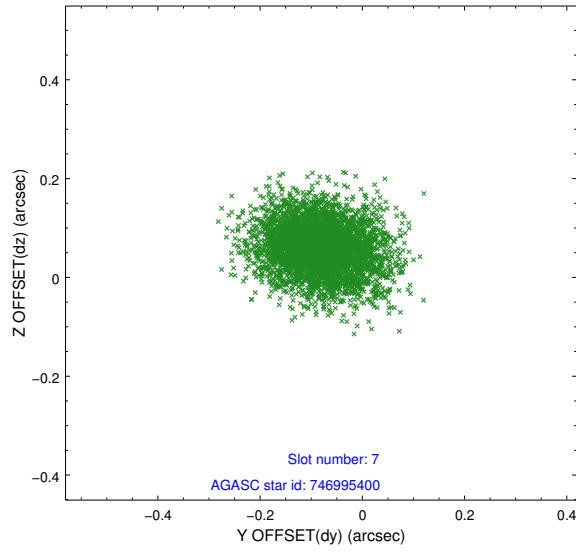


## 2.4.4 Slot 6



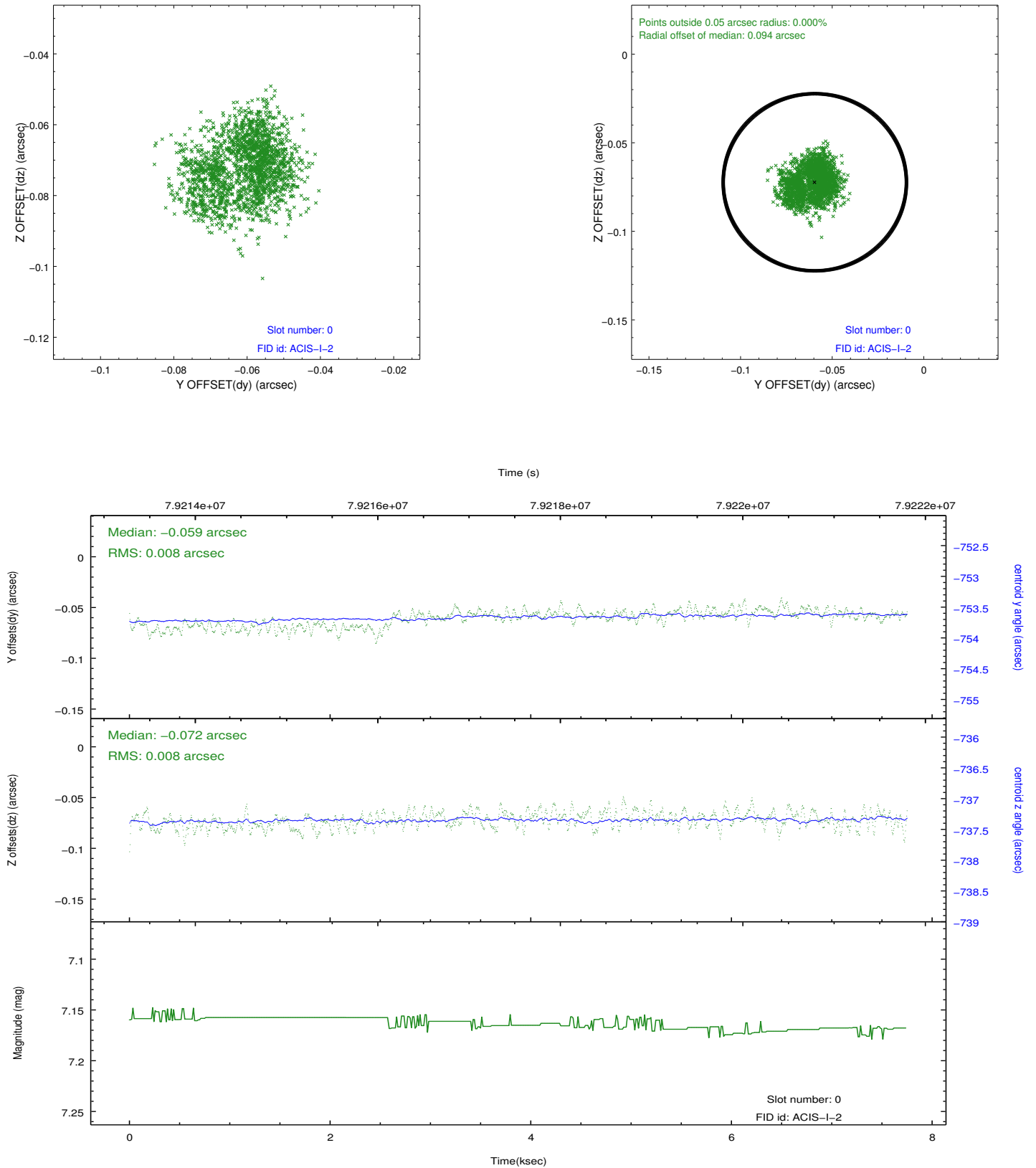


## 2.4.5 Slot 7

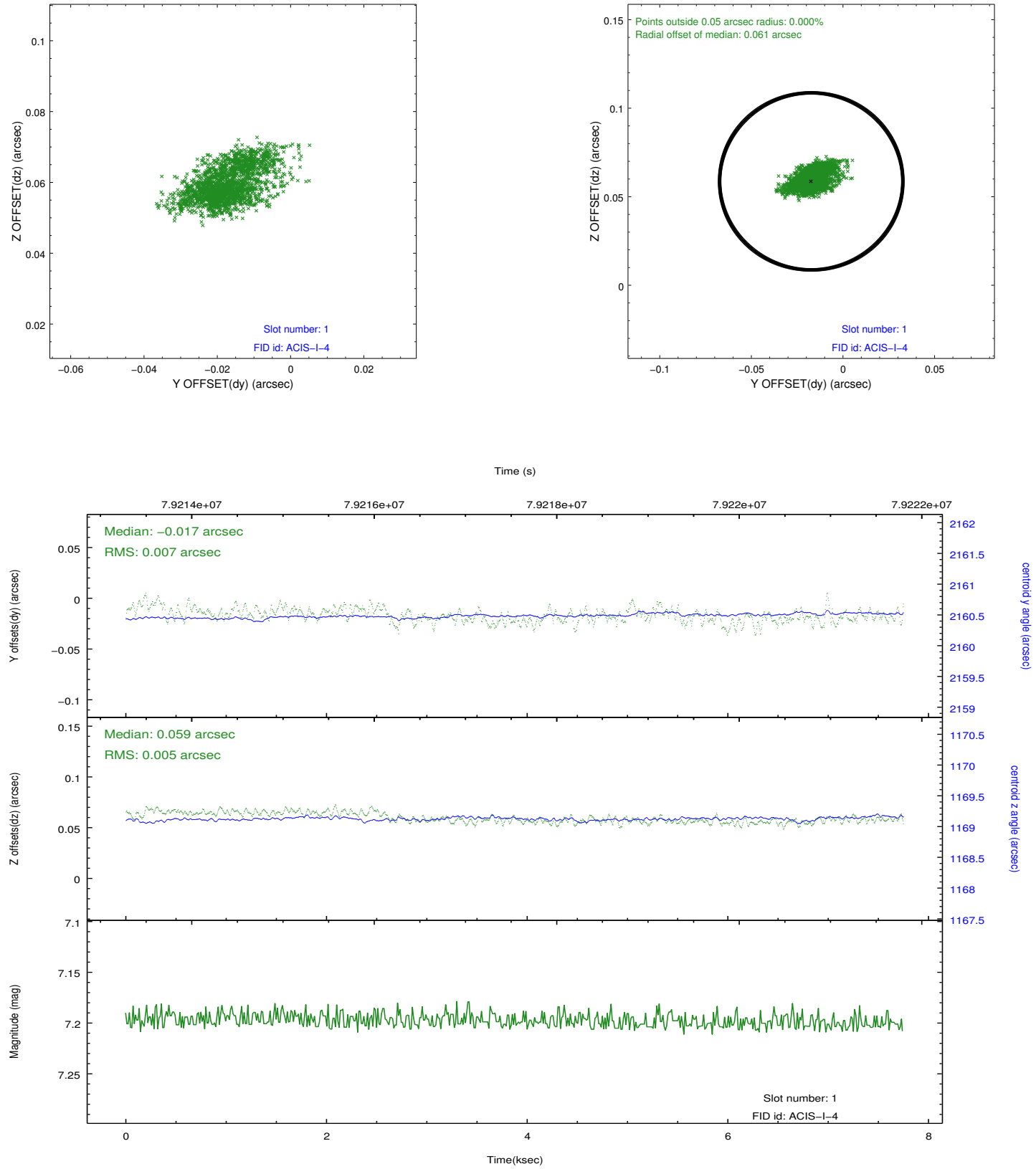


## 2.5 FID Slots

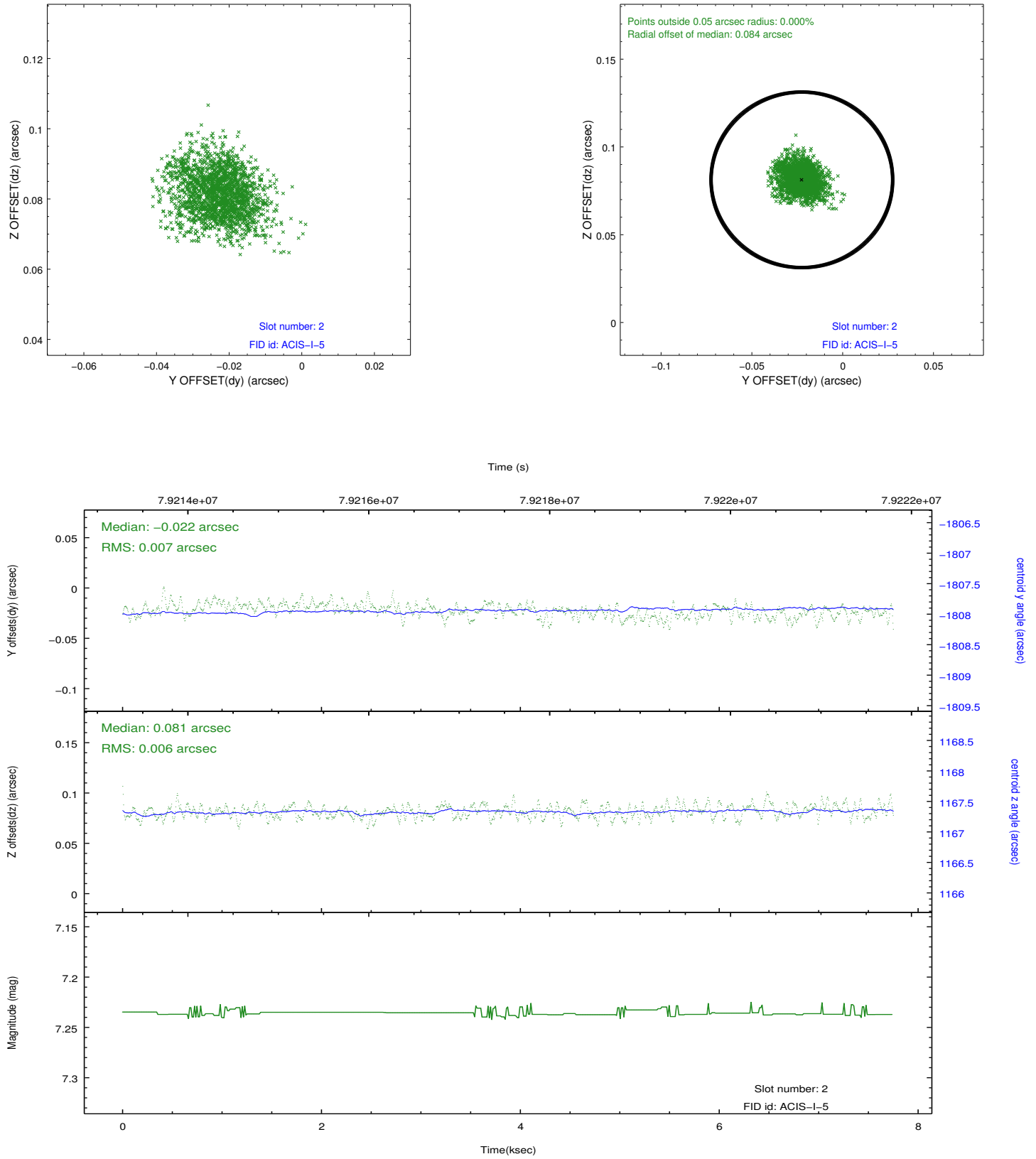
### 2.5.1 Slot 0



## 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)	2018.03.05
V&V Edition	2
V&V Disposition and Status	OK
V&V Charge Time	7.321

## 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.