

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 22088 - L2 Version 2
Chandra X-Ray Center

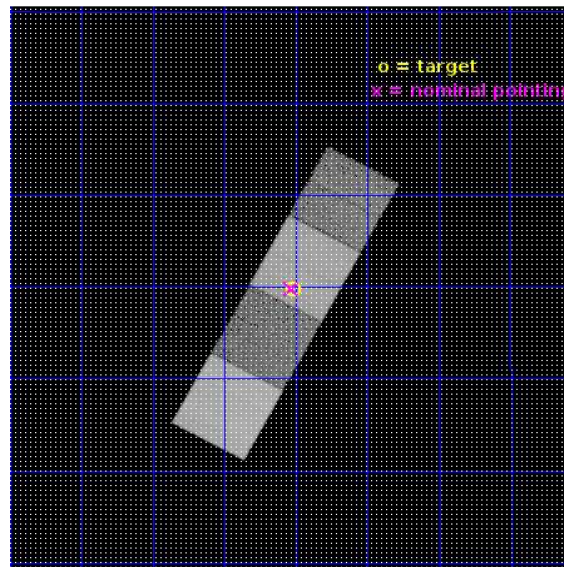
L2 Processing Date : Feb 14 2019

Contents

1	Front	2
2	OBI	3
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
A	Summary	17
A.1	Status	17
A.2	Comments	17

1 Front

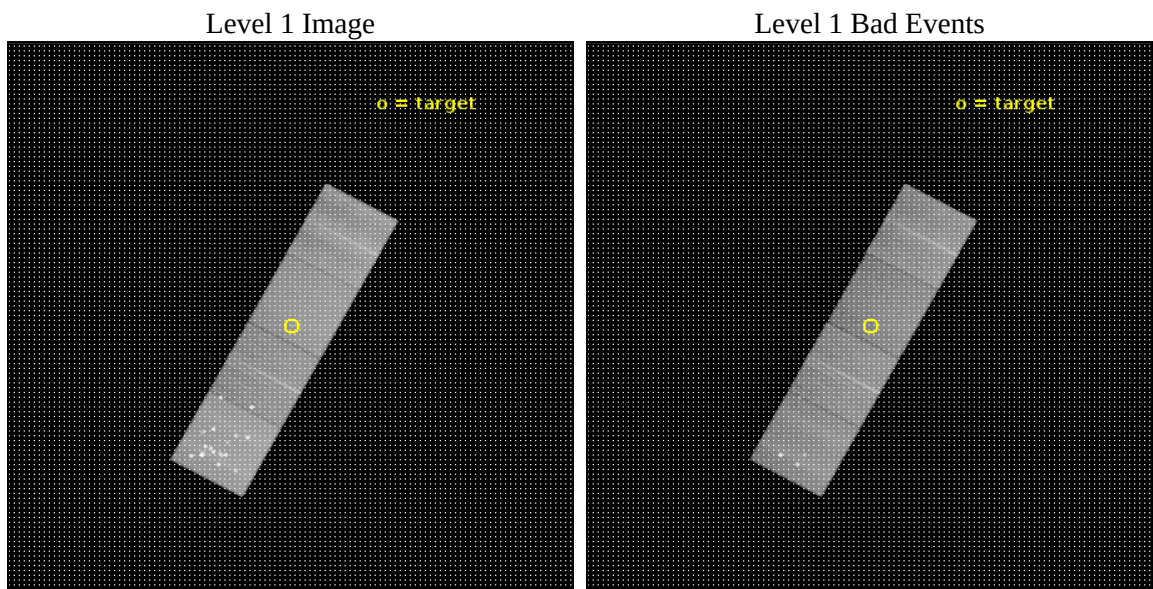
seq_num	703859	Sequence number
obs_id	22088	Observation id
title	Calibration of the quasar Hubble diagram with z	Proposal title
observer	Francesca Civano	Principal investigator
object	SDSSJ081331.13+040949.4	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	123.379738	Observer's specified target RA [deg]
dec_targ	4.163727	Observer's specified target Dec [deg]
ra_nom	123.38358917451	Nominal RA [deg]
dec_nom	4.1638637471899	Nominal Dec [deg]
roll_nom	298.37783901077	Nominal Roll [deg]
revision	2	Processing version of data
ontime	26953.441702247	Sum of GTIs [s]
livetime	26601.275143572	Livetime [s]
ontime5	26953.400662303	Sum of GTIs [s]
ontime6	26950.218572021	Sum of GTIs [s]
ontime7	26953.441702247	Sum of GTIs [s]
ontime8	26953.318582296	Sum of GTIs [s]
l2events	297945	Number of level 2 events



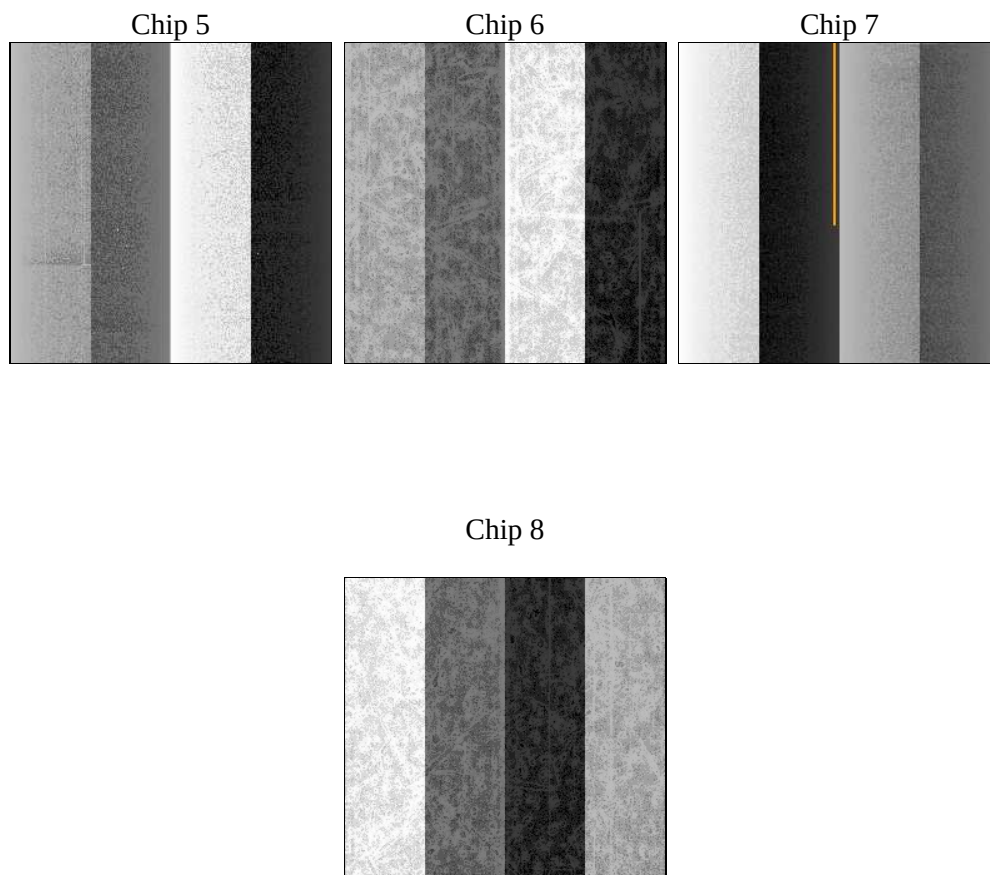
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	26894.828000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	26953.441702247	Sum of GTIs [s]
caldsver	4.8.2	 	ontime5	26953.400662303	Sum of GTIs [s]
date	2019-02-14T22:13:56	Date and time of file creation	ontime6	26950.218572021	Sum of GTIs [s]
revision	2	Processing version of data	ontime7	26953.441702247	Sum of GTIs [s]
			ontime8	26953.318582296	Sum of GTIs [s]
			l1events	1173042	Number of level 1 events

2.1.4 Events

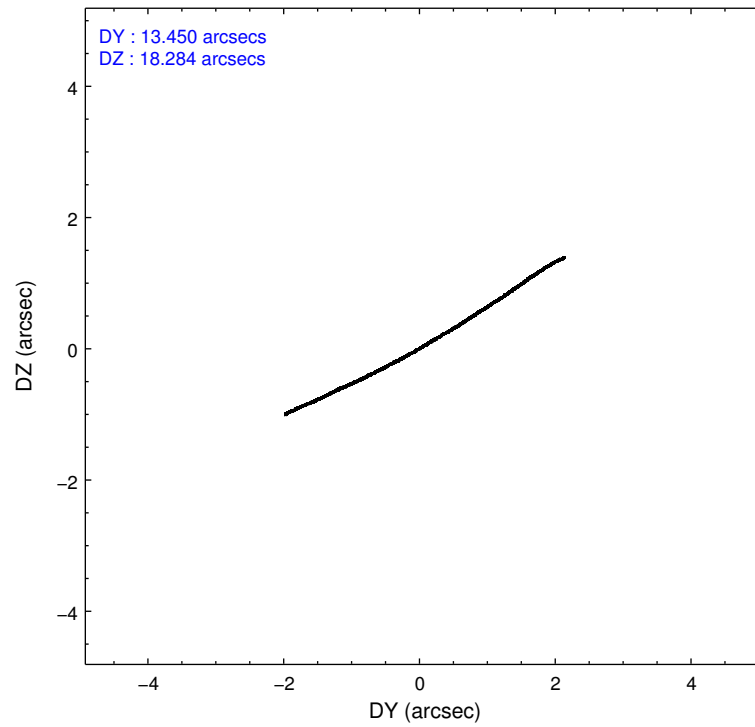
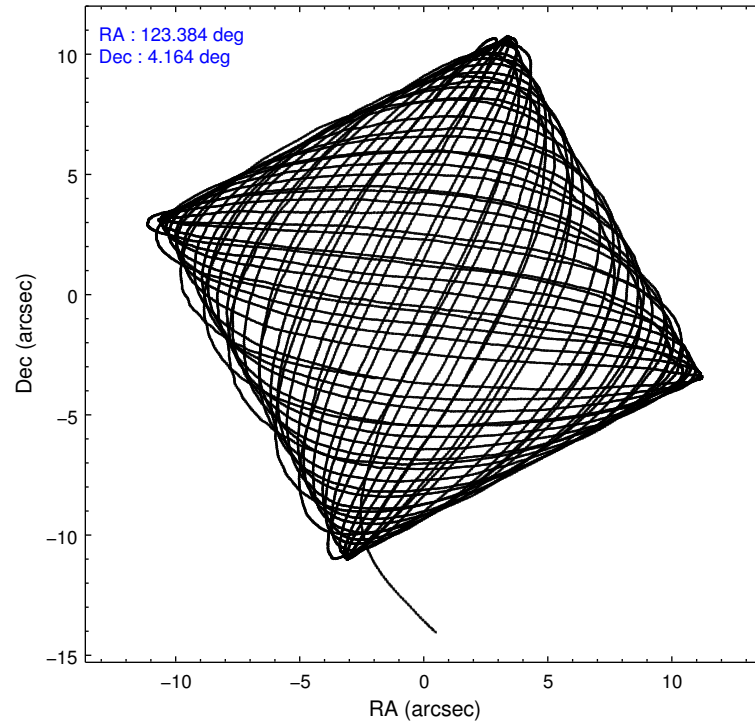
	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	423045	224095	260617	265285
rejected events	188302	193179	148639	198673
rejected %	44%	86%	57%	74%

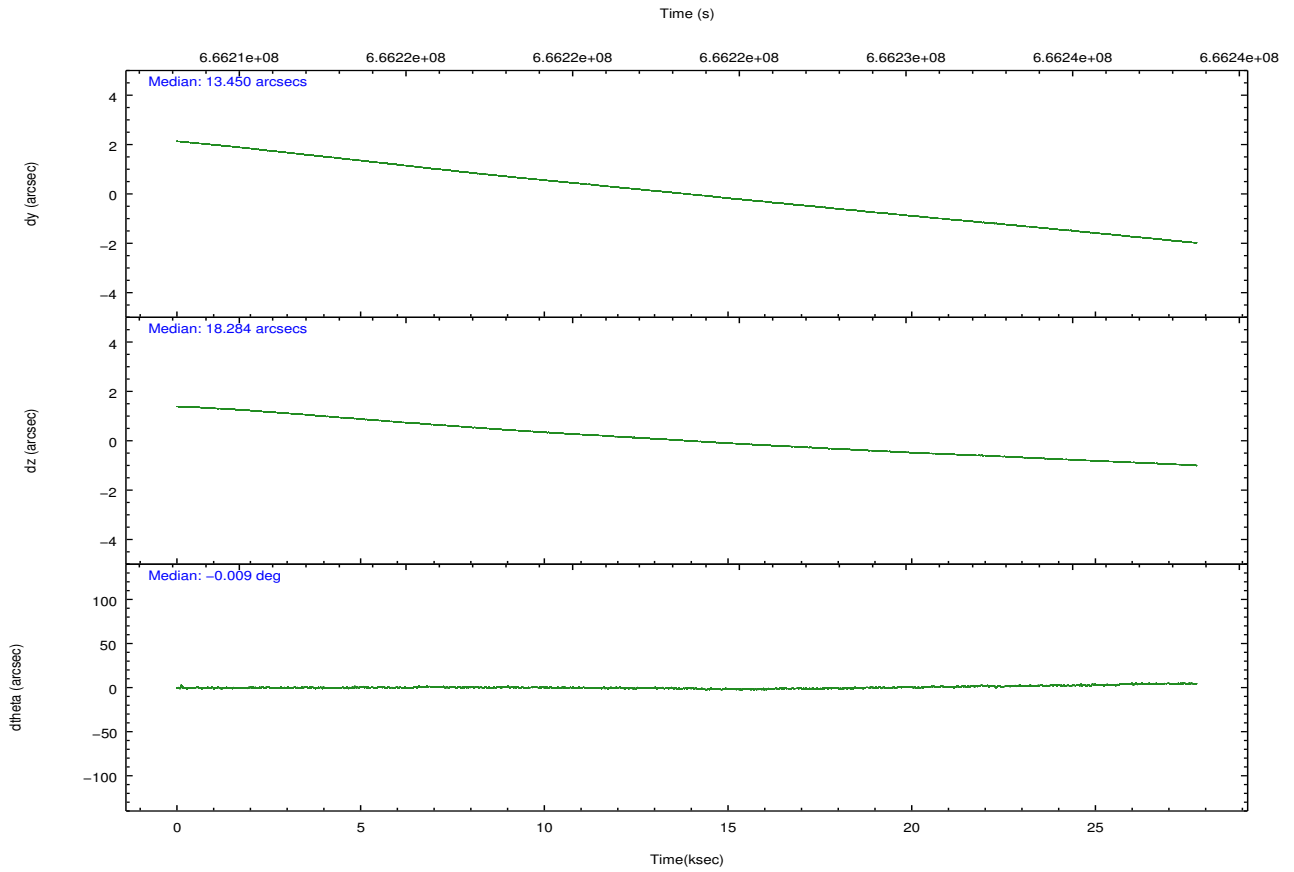
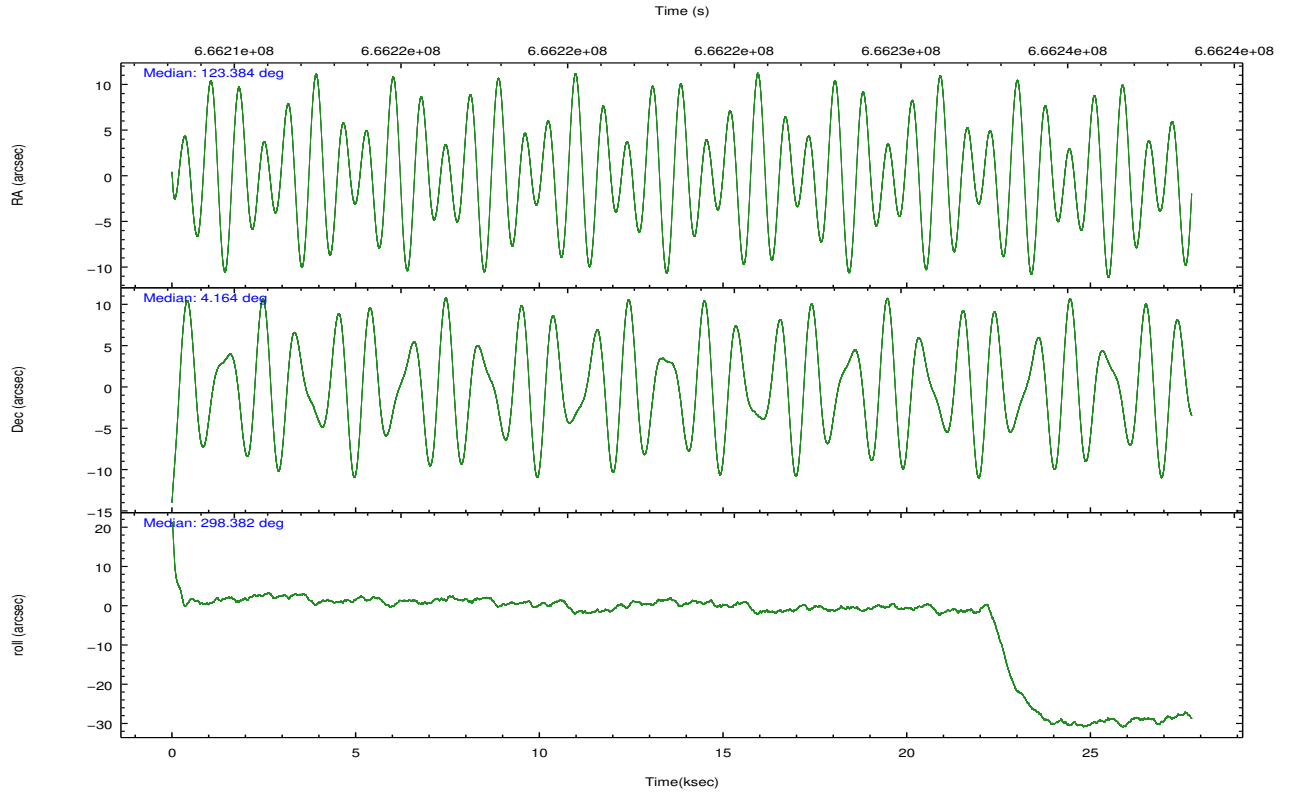
	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	70584	15037	9437	18385
	16%	6%	3%	6%
grade 1 events	932	119	406	210
	0%	0%	0%	0%
grade 2 events	62592	5951	23507	16504
	14%	2%	9%	6%
grade 3 events	6865	1945	8704	6914
	1%	0%	3%	2%
grade 4 events	6695	1863	8388	6243
	1%	0%	3%	2%
grade 5 events	23761	8519	25131	13625
	5%	3%	9%	5%
grade 6 events	88058	6131	61964	18576
	20%	2%	23%	7%
grade 7 events	163558	184530	123080	184828
	38%	82%	47%	69%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-5678	ACIS-5678	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	Obspar update status	NONE	UPDATED
Data mode	VFAINT	VFAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	123.359977	123.3835891745139	Subarray requested	NONE	NONE
[deg] Pointing Dec	4.177929	4.163863747189896	Alternating exposures requested	N	N
[deg] Pointing Roll	298.222925	298.3778390107732	[s] Primary exposure time	0.000000	3.1
[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)	666210407.184000	666209189.84745			
Observation start date	2019-02-10T18:25:38	2019-02-10T18:06:29			
[s] Observation end time (MET)	666237301.184000	666237634.62415			
Observation end date	2019-02-11T01:53:52	2019-02-11T02:00:34			
Read mode	TIMED	TIMED			

2.3 Aspect



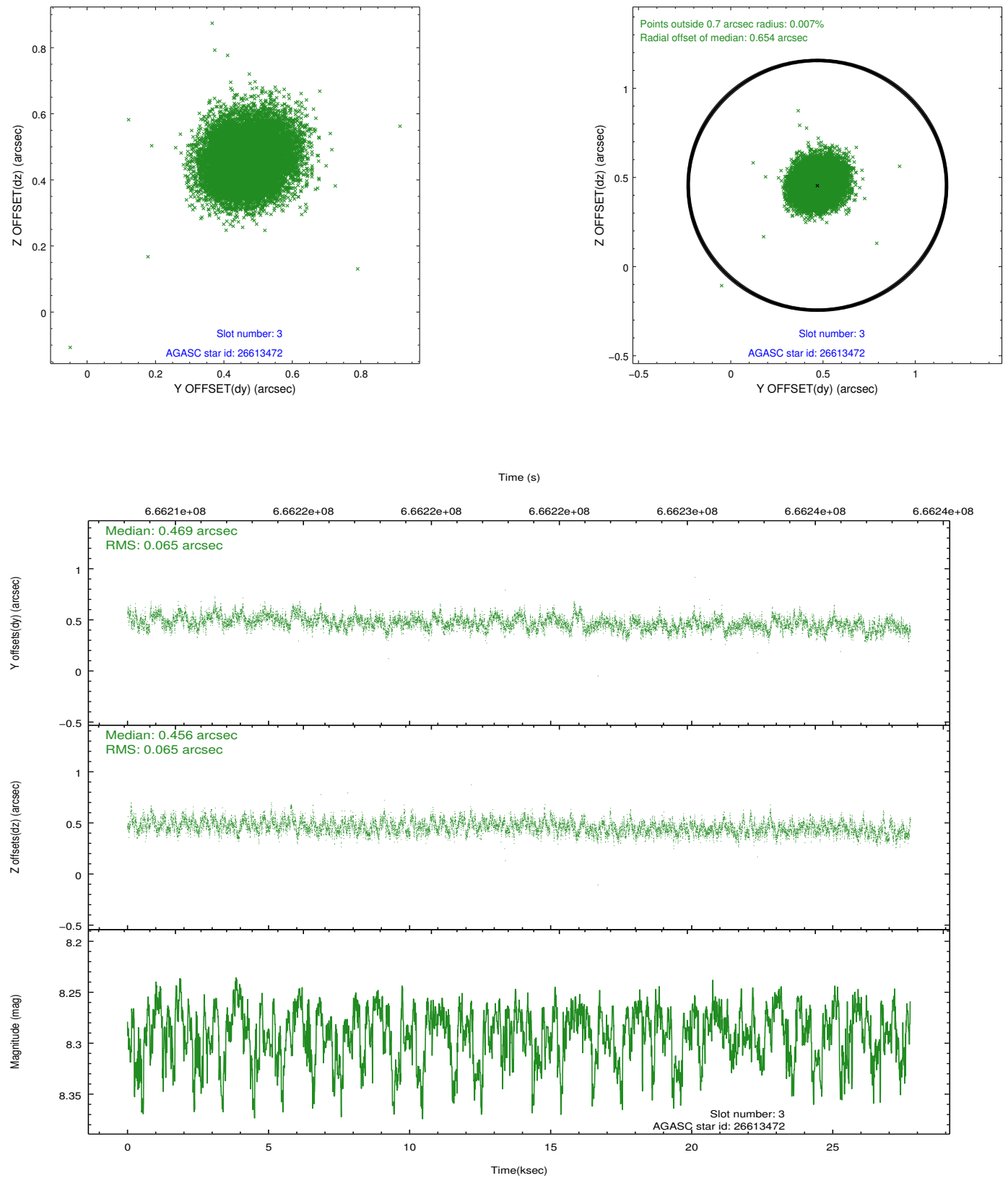


Slot Statistics

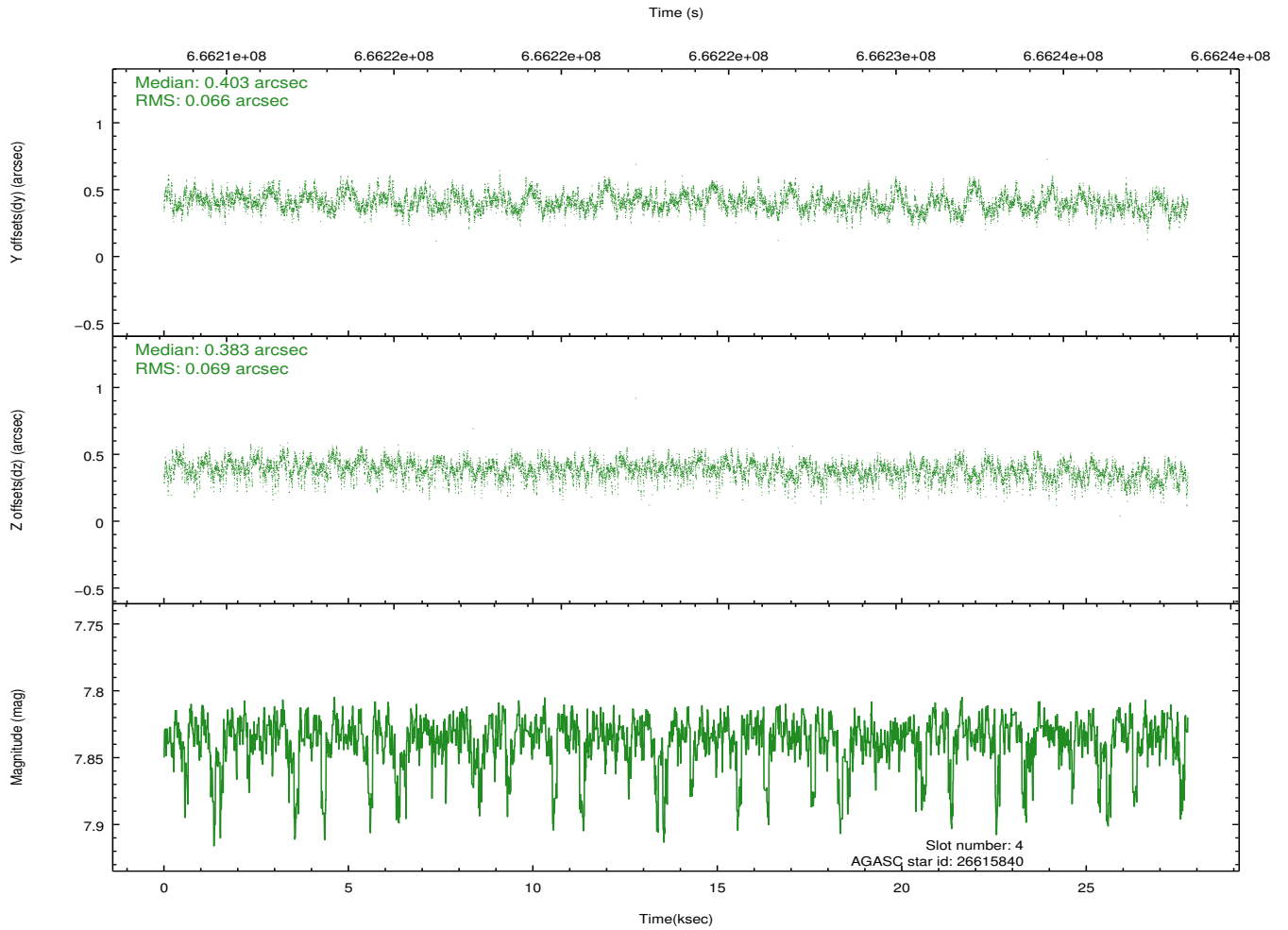
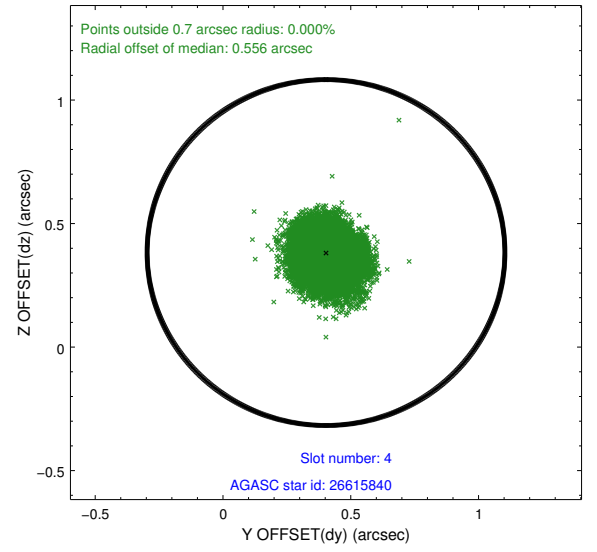
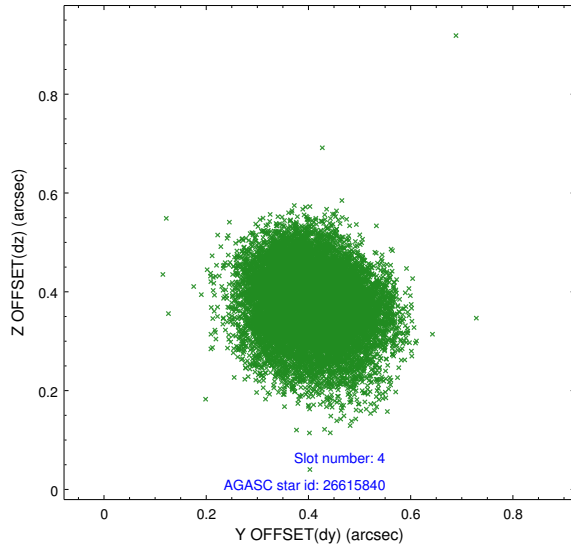
pt	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-1	7.20	6770	1.000	0.206	-0.078	0.020	0.028	0.000000	0.000000	929.94	-1735
1	FID		ACIS-S-5	7.21	6770	1.000	-0.522	0.081	0.029	0.060	0.000000	0.000000	-1819.83	162
2	FID		ACIS-S-6	7.36	6769	1.000	0.295	0.009	0.030	0.047	0.000000	0.000000	395.34	806
3	GUIDE	used	26613472	8.29	13532	1.000	0.469	0.456	0.098	0.156	122.862504	4.380468	-1486.97	-1228
4	GUIDE	used	26615840	7.83	13536	1.000	0.403	0.383	0.103	0.163	122.956620	4.274537	-992.11	-1110
5	GUIDE	used	26619176	8.35	13534	1.000	-0.185	-0.039	0.102	0.171	123.682548	4.587525	-752.51	1717
6	GUIDE	used	26743608	8.34	13529	1.000	-0.310	-0.353	0.130	0.194	124.031272	3.796539	2349.15	1475
7	GUIDE	used	26745624	7.50	13538	1.000	-0.382	-0.437	0.093	0.151	124.084860	4.043681	1655.93	2064

2.4 Star Slots

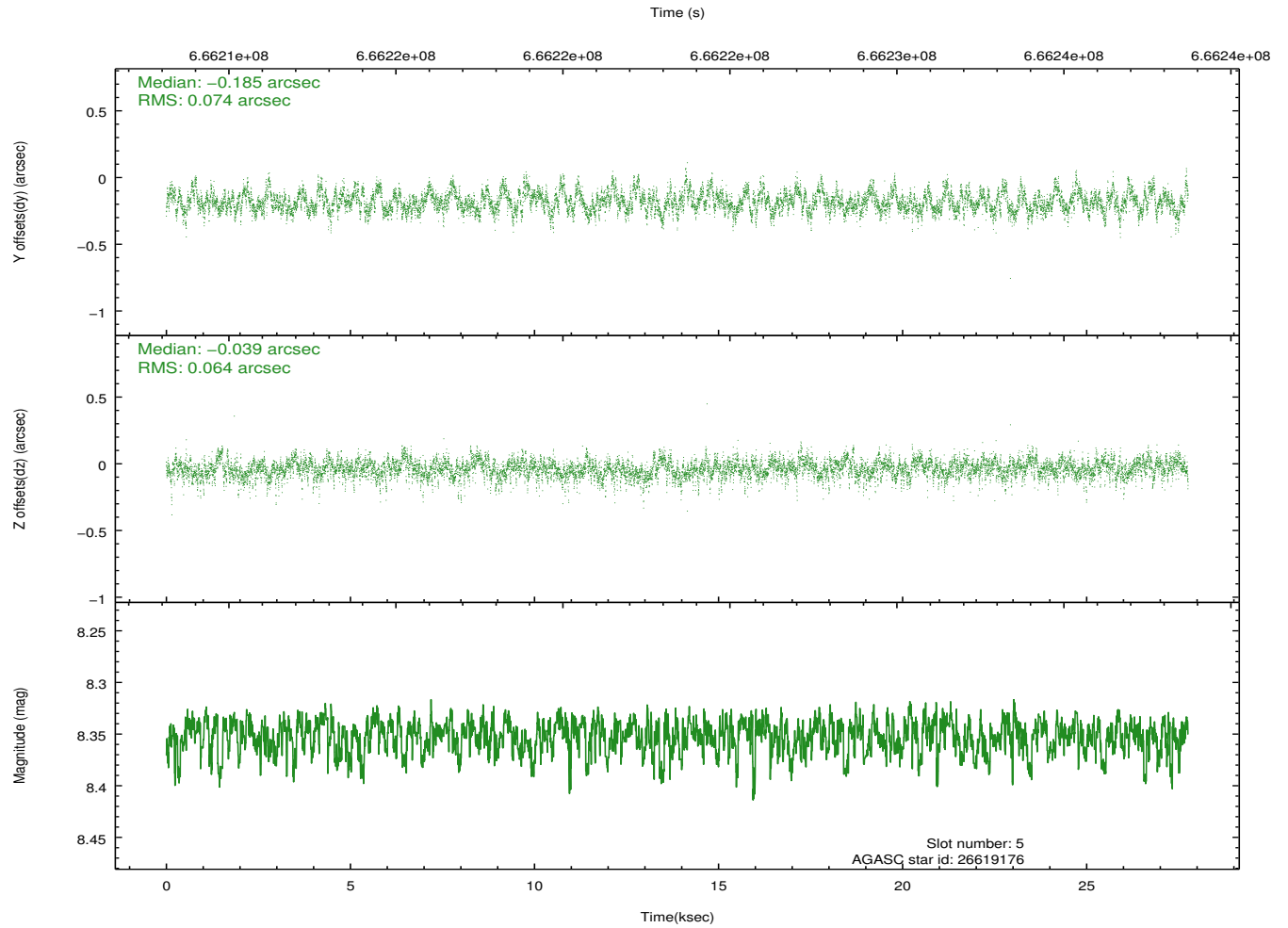
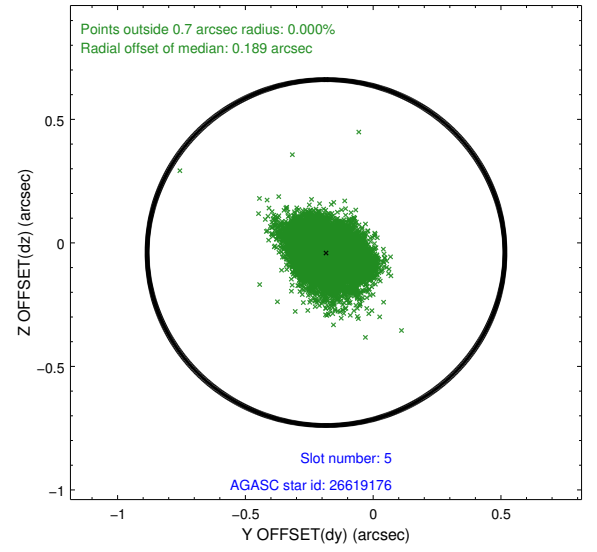
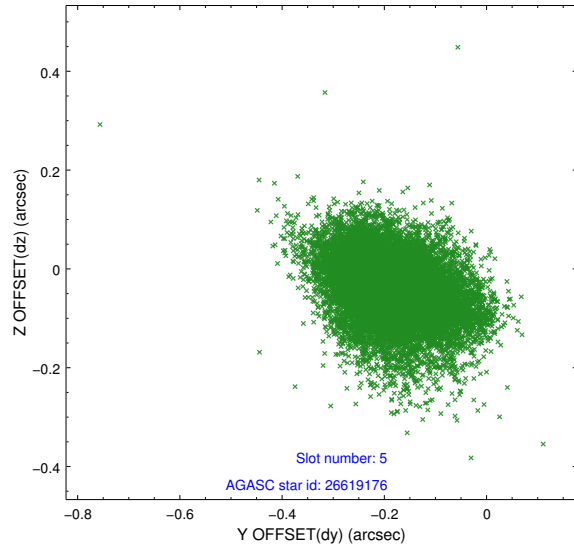
2.4.1 Slot 3



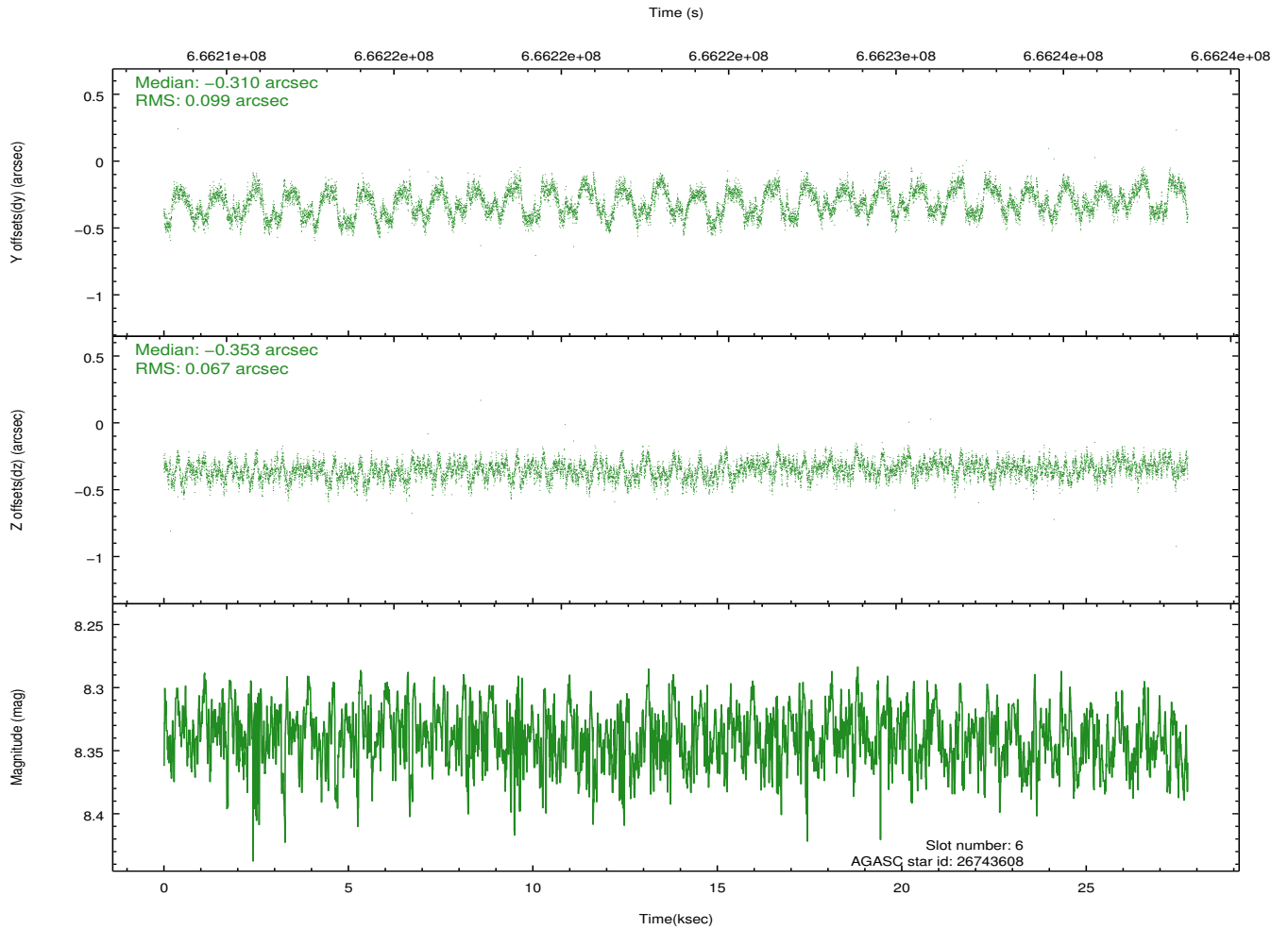
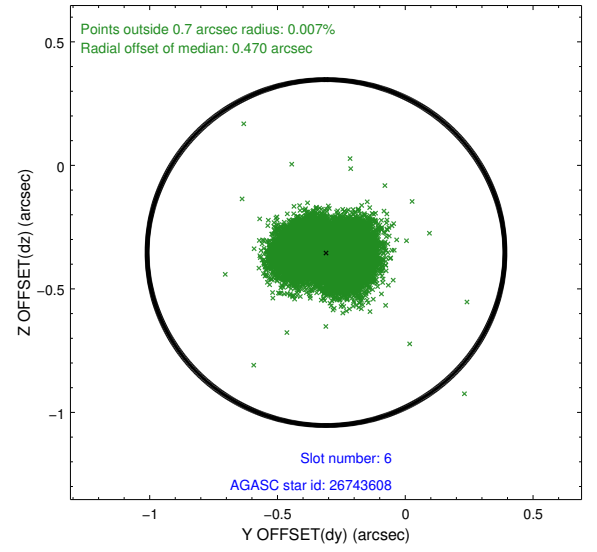
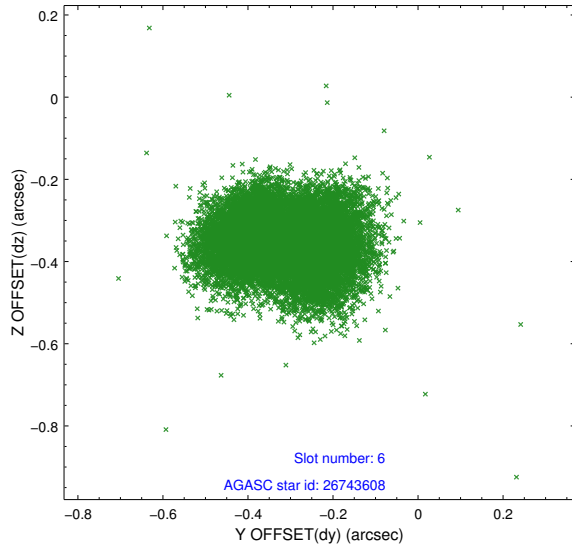
2.4.2 Slot 4



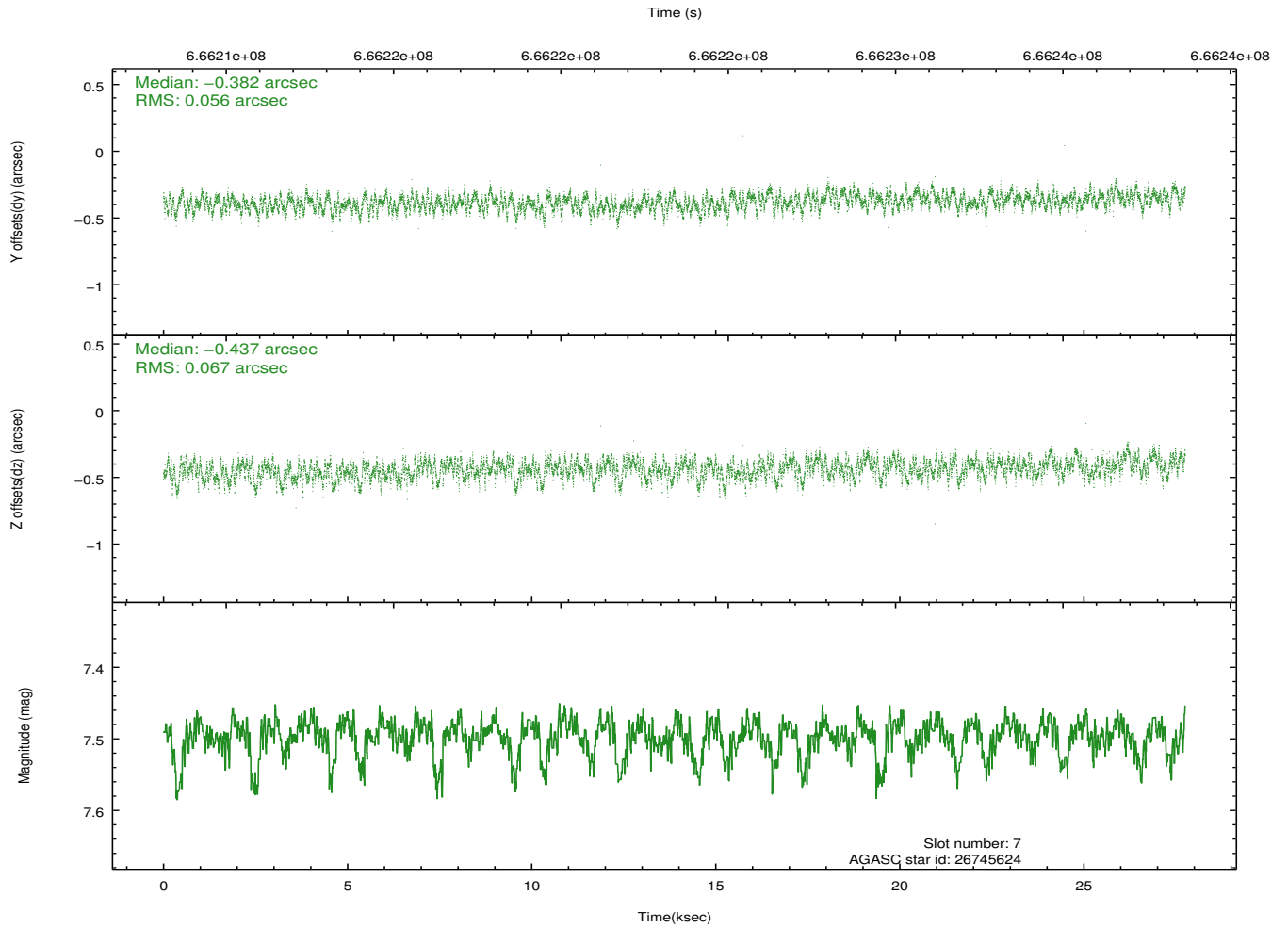
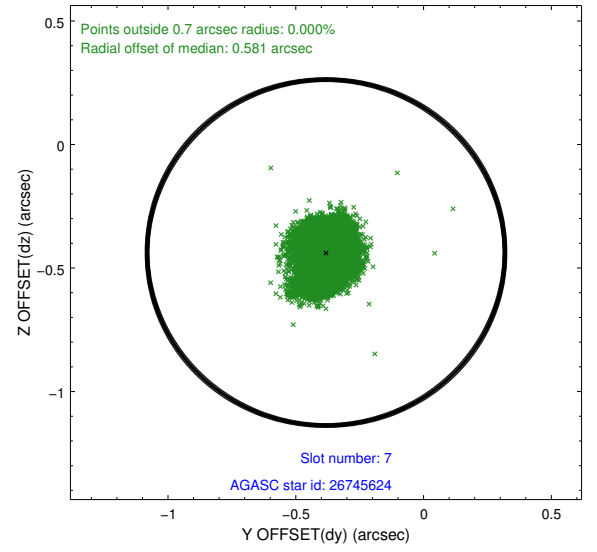
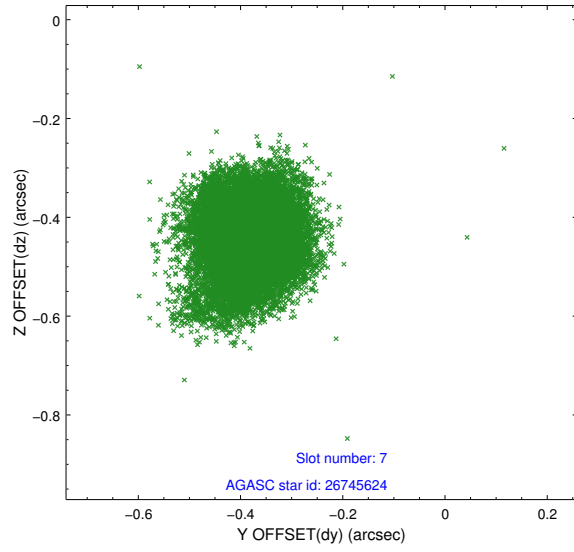
2.4.3 Slot 5



2.4.4 Slot 6

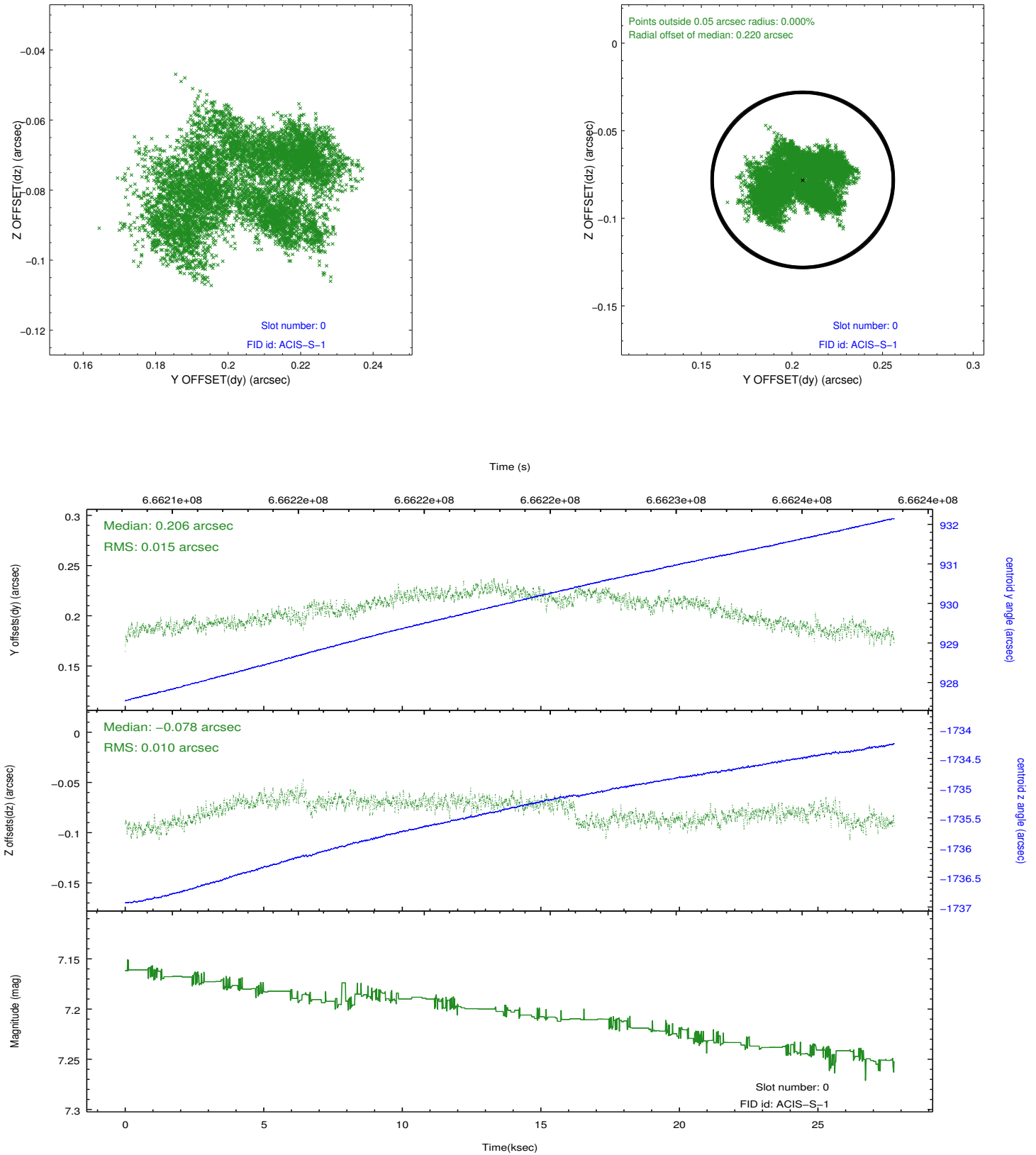


2.4.5 Slot 7

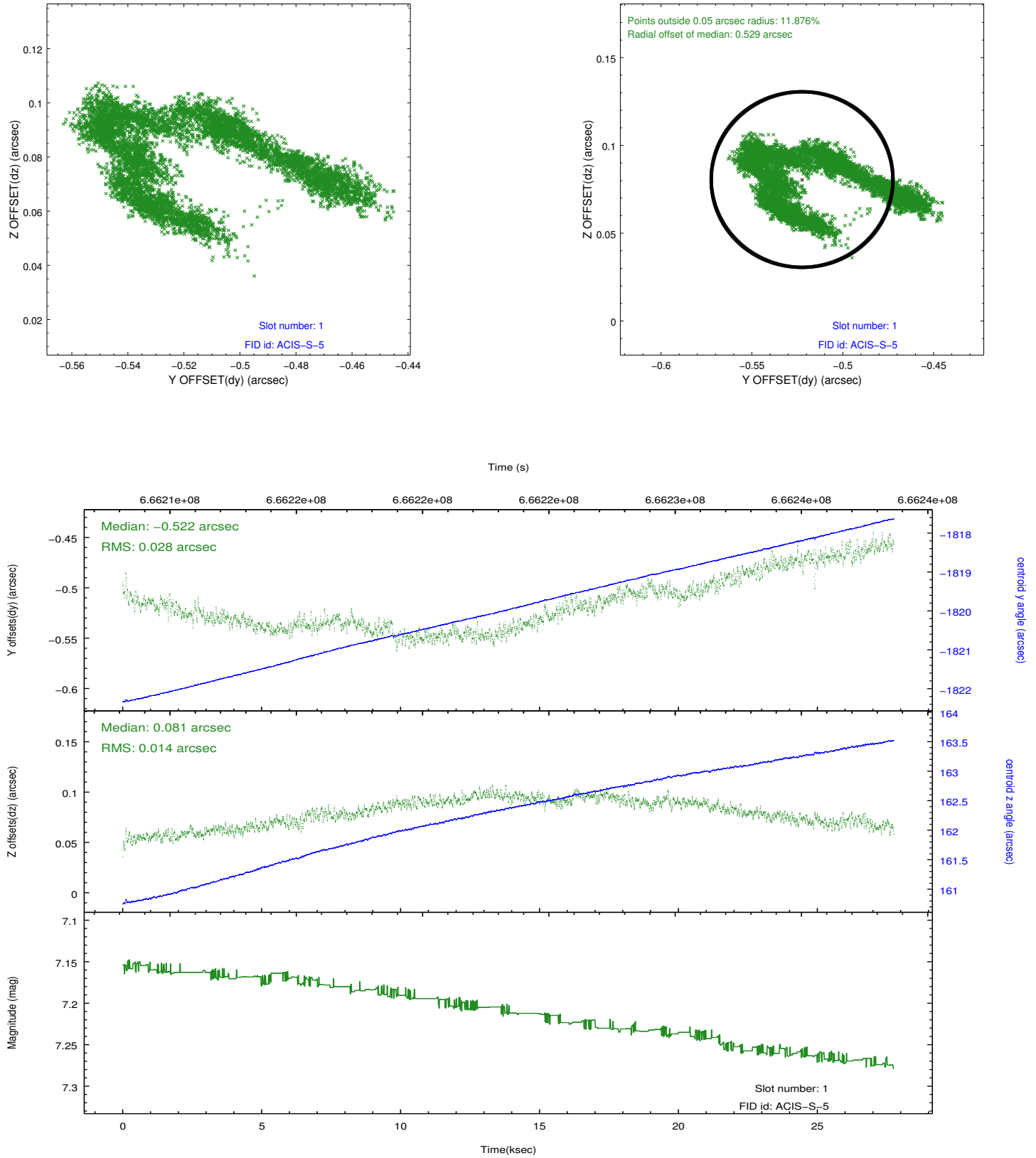


2.5 FID Slots

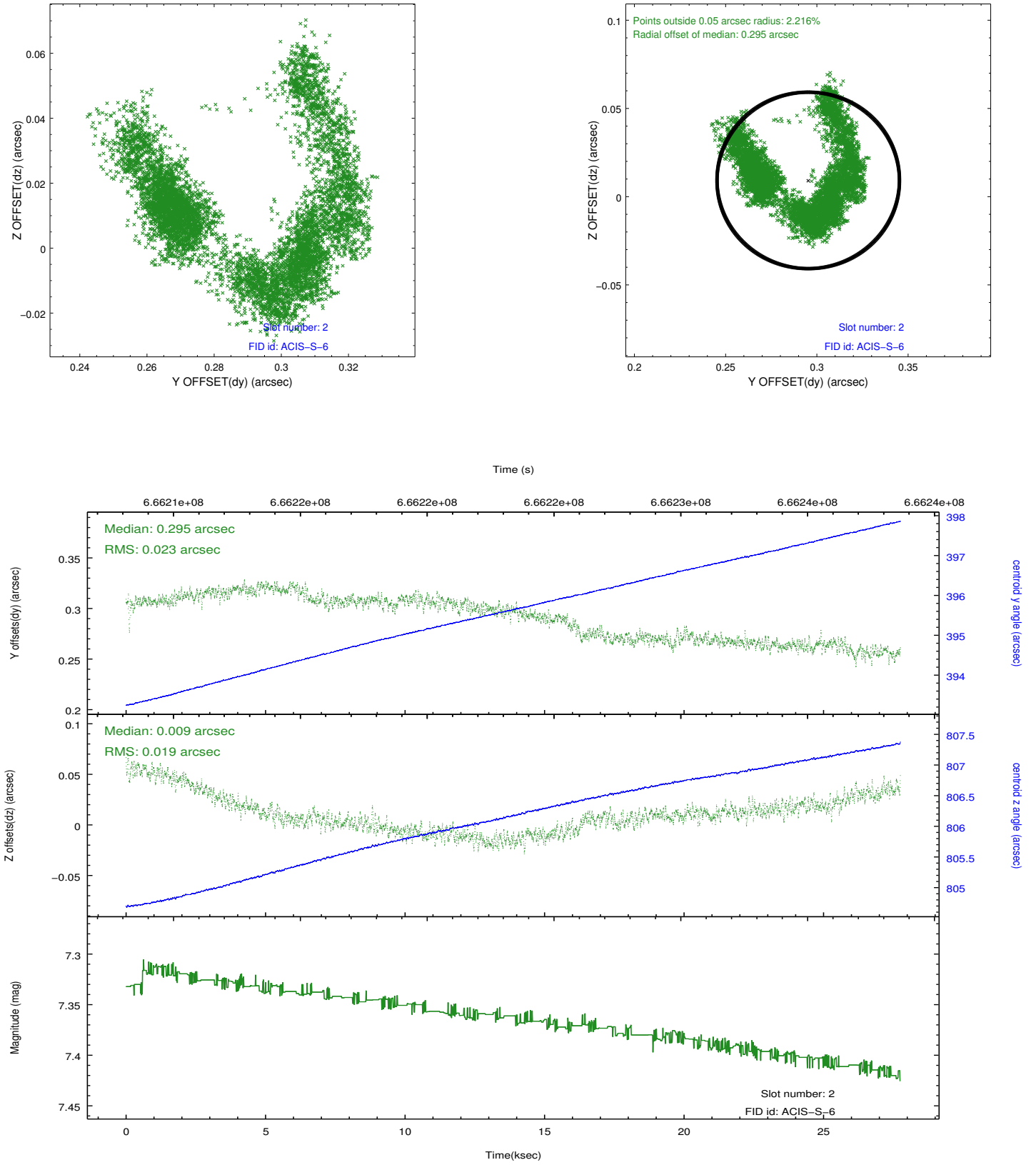
2.5.1 Slot 0



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)	2019.02.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	26.953441702247

A.2 Comments

To compensate for a few bad pixels not marked as bad that were not removed in the Level 2 processing, a custom bad pixel file with additional bad pixels at (chipx, chipy) = (232:234,322:339) in S1 was added in this processing. As a result, the user will NOT find a relatively bright square of pixels on the S1 chip for level 2 data caused by the application of the dither algorithm to the bad pixels in question, as opposed to previous processing(s).

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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., -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/A_CIS_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.