

V&V Reference Report

L2 ASCDS Version : 10.7.1

Observation 22005 - L2 Version 1
Chandra X-Ray Center

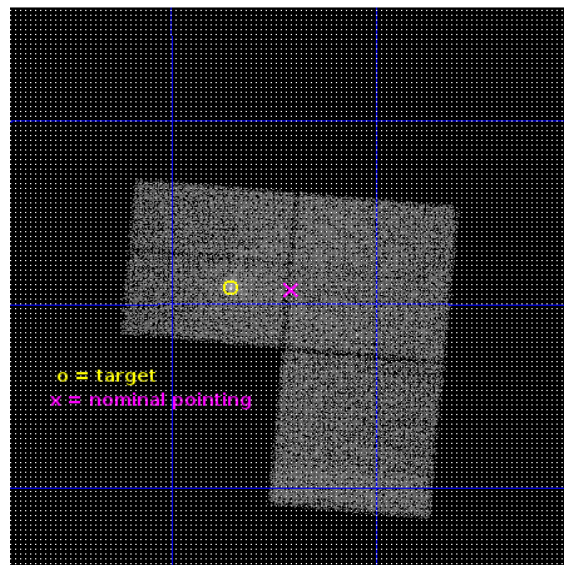
L2 Processing Date : Jun 5 2019

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1 Front

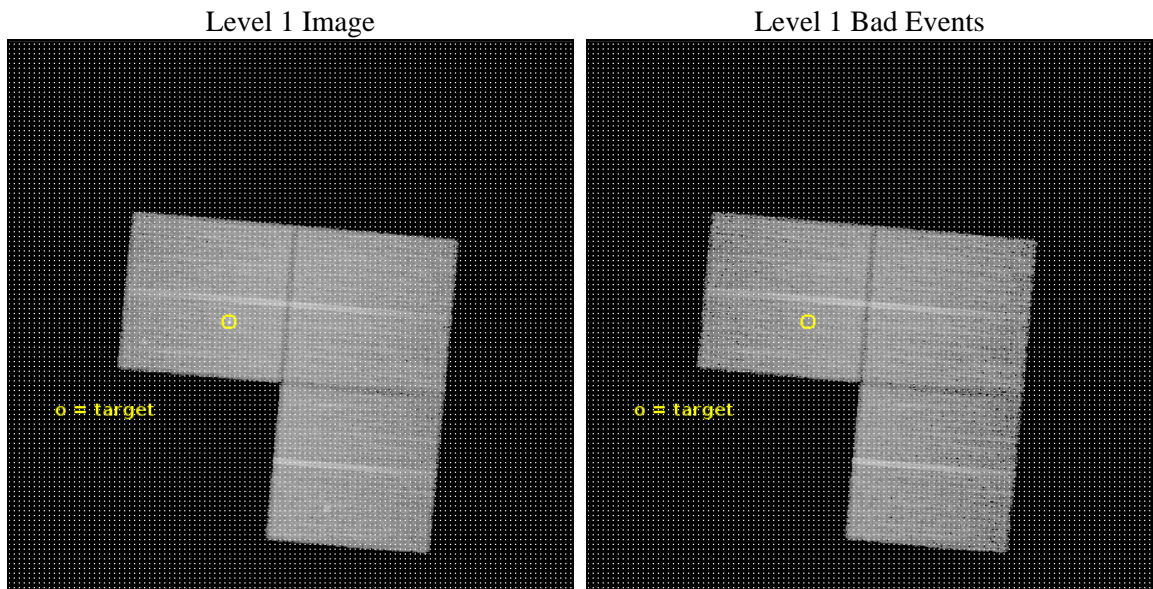
seq_num	502999	Sequence number
obs_id	22005	Observation id
title	The Answer is Blowing in the Wind: Jet Sweepback in Three PWNe	Pro
observer	Roger Romani	Principal investigator
object	PSR J1709-4429	Source name
dtcycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	257.427724	Observer's specified target RA [deg]
dec_targ	-44.485585	Observer's specified target Dec [deg]
ra_nom	257.35345942746	Nominal RA [deg]
dec_nom	-44.487157829127	Nominal Dec [deg]
roll_nom	5.1566586585957	Nominal Roll [deg]
revision	1	Processing version of data
ontime	30296.259232879	Sum of GTIs [s]
livetime	29900.41630222	Livetime [s]
ontime1	30289.977182746	Sum of GTIs [s]
ontime2	30296.259232879	Sum of GTIs [s]
ontime3	30299.40023315	Sum of GTIs [s]
l2events	81285	Number of level 2 events



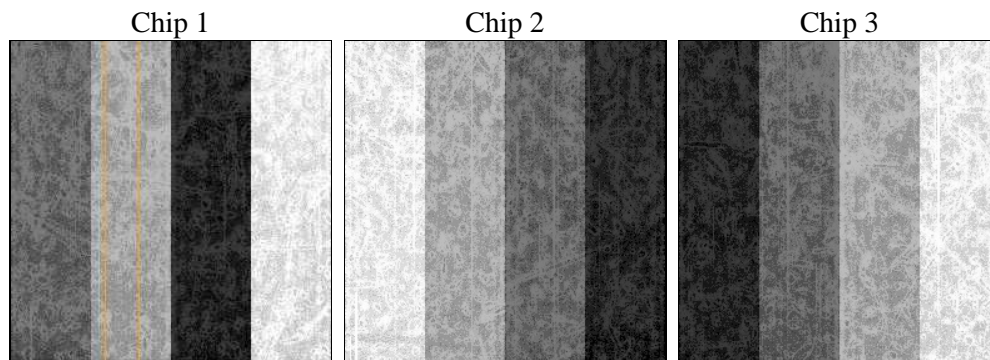
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	30174.354000	[s] Scheduled observation exposure time
ascdsver	10.7.1	Processing system revision	ontime	30296.259232879	Sum of GTIs [s]
caldbver	4.8.3	 	ontime1	30289.977182746	Sum of GTIs [s]
date	2019-06-05T15:16:34	Date and time of file creation	ontime2	30296.259232879	Sum of GTIs [s]
revision	1	Processing version of data	ontime3	30299.40023315	Sum of GTIs [s]
			l1events	694739	Number of level 1 events

2.1.4 Events

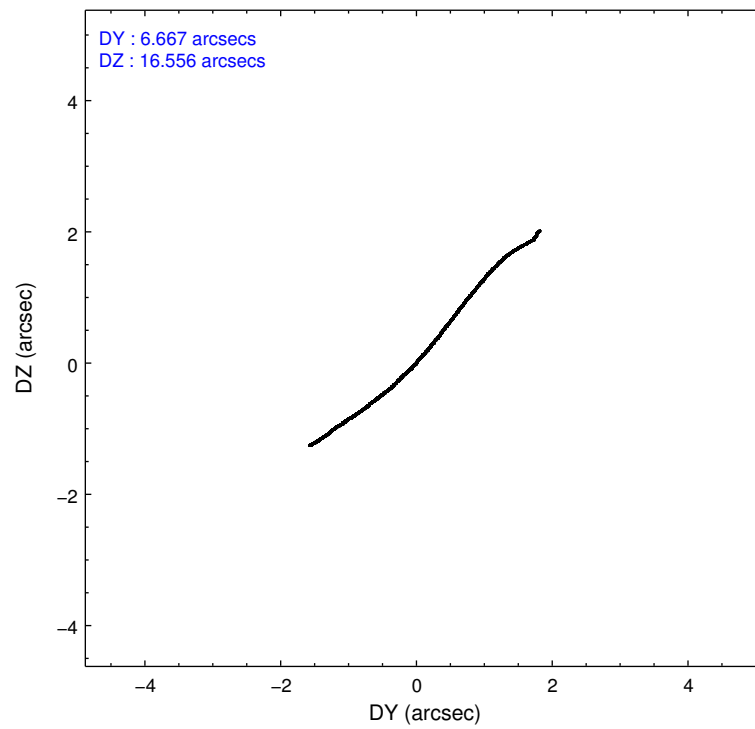
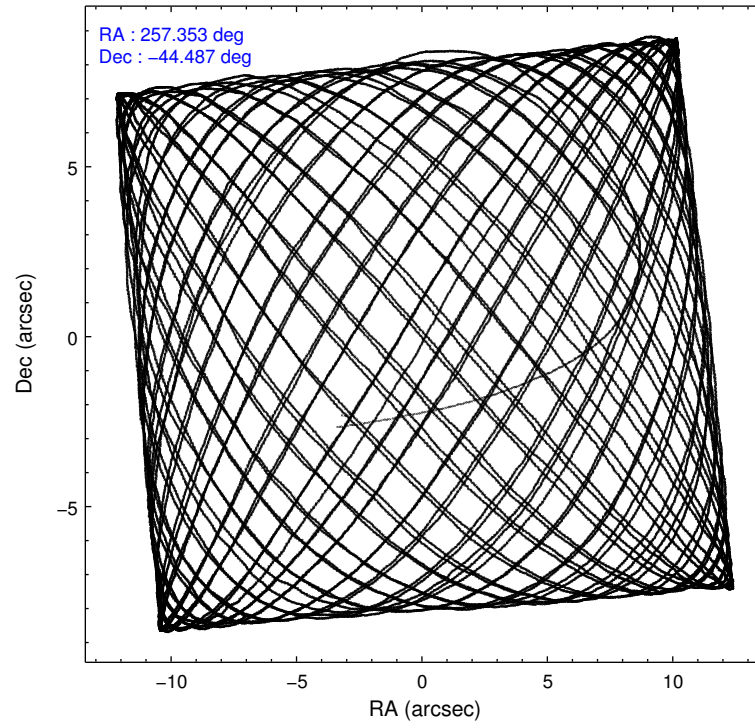
	ccd 1	ccd 2	ccd 3
level 1 events	216332	242170	236237
rejected events	185462	209511	205660
rejected %	85%	86%	87%

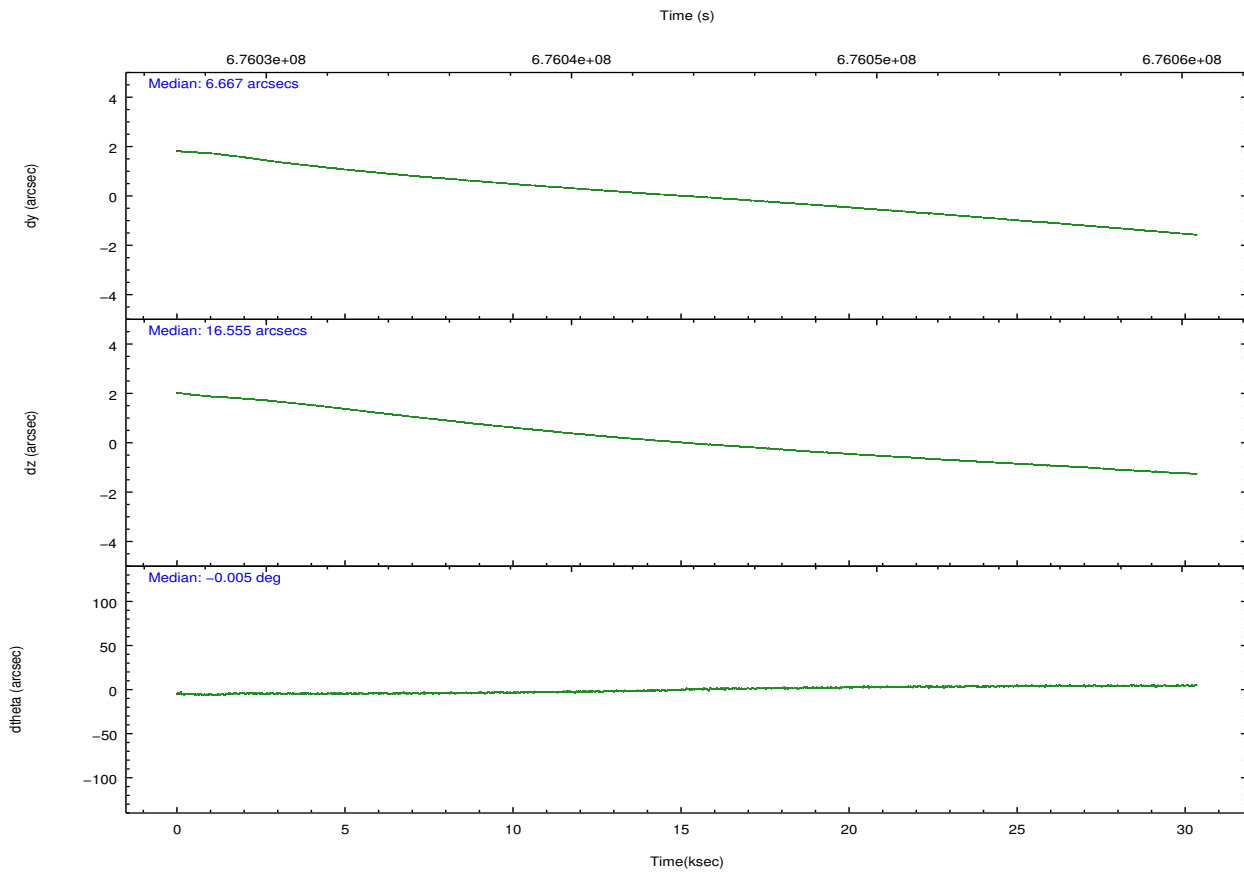
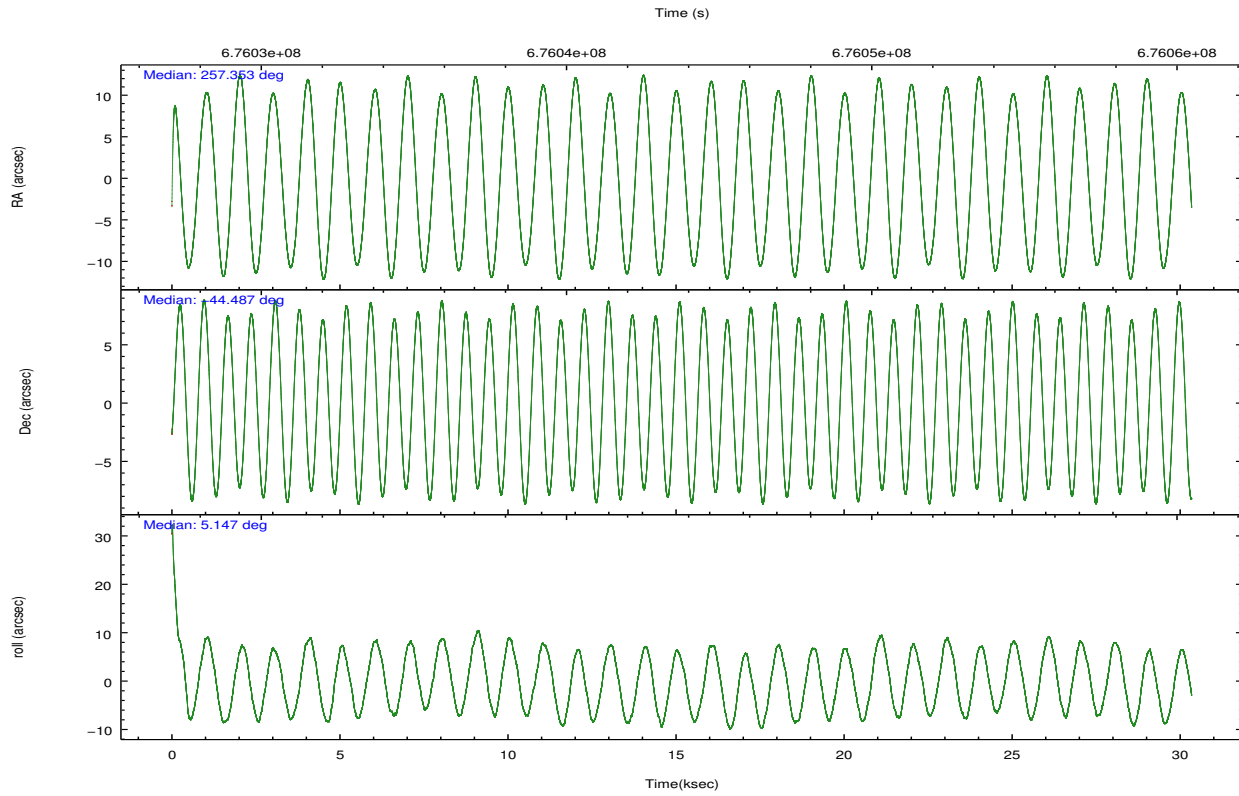
	ccd 1	ccd 2	ccd 3
grade 0 events	10947	15117	13826
	5%	6%	5%
grade 1 events	112	135	134
	0%	0%	0%
grade 2 events	8119	6820	5837
	3%	2%	2%
grade 3 events	2634	2680	2727
	1%	1%	1%
grade 4 events	2516	2708	2791
	1%	1%	1%
grade 5 events	9527	8790	10518
	4%	3%	4%
grade 6 events	6663	5338	5396
	3%	2%	2%
grade 7 events	175814	200582	195008
	81%	82%	82%

2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-123	ACIS-123	Obspar file type	PREDICTED	ACTUAL
Grating	NONE	NONE	Obspar update status	NONE	UPDATED
Data mode	VFAINT	VFAINT	CCD I0 on	O1	N
Observation mode	POINTING	POINTING	CCD I1 on	Y	Y
[deg] Pointing RA	257.321884	257.353459427457	CCD I2 on	Y	Y
[deg] Pointing Dec	-44.503139	-44.48715782912713	CCD I3 on	Y	Y
[deg] Pointing Roll	4.925831	5.156658658595692	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	-226.279963	-226.2858628250985	CCD S3 on	N	N
[mm] SIM translation stage offset	-7.3125	-7.306590177831225	CCD S4 on	N	N
[s] Observation start time (MET)	676028779.184000	676027425.07257	CCD S5 on	N	N
Observation start date	2019-06-04T09:45:10	2019-06-04T09:23:45	Number of optional ACIS chips dropped	1	1
[s] Observation end time (MET)	676058953.184000	676059403.02449	On-chip summing requested	N	N
Observation end date	2019-06-04T18:08:04	2019-06-04T18:16:43	Subarray requested	NONE	NONE
Read mode	TIMED	TIMED	Alternating exposures requested	N	N
			[s] Primary exposure time	0.000000	3.1

2.3 Aspect





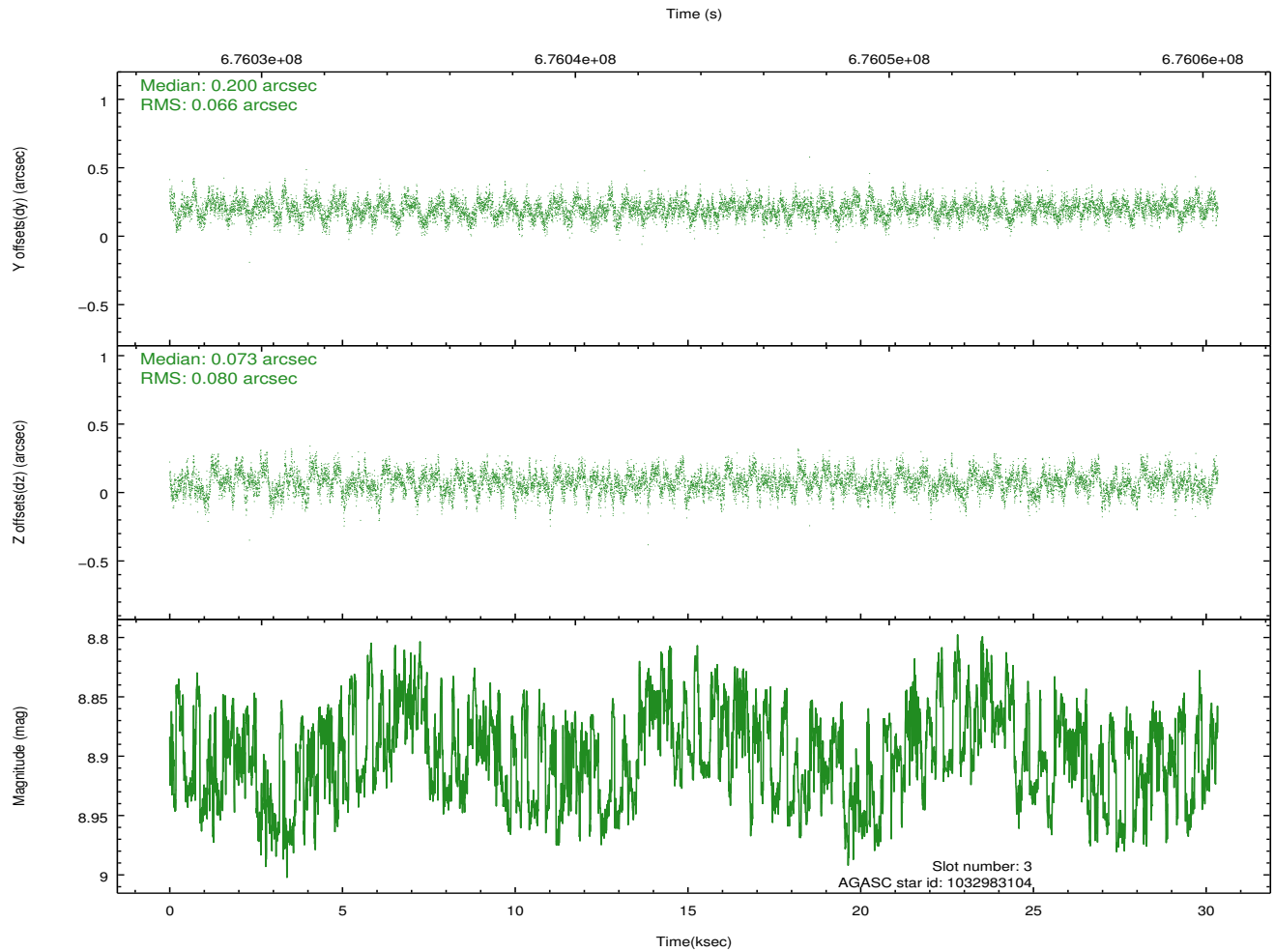
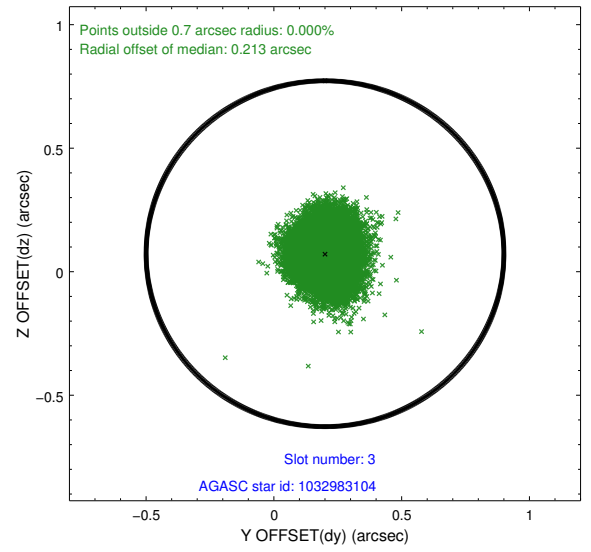
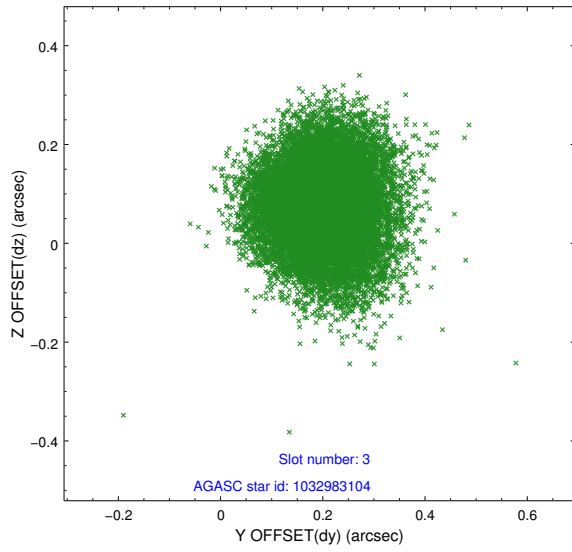
Slot Statistics

slot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-I-1	7.19	7401	1.000	0.165	-0.145	0.035	0.048	0.000000	0.000000	933.08	-990
1	FID		ACIS-I-5	7.19	7401	1.000	-0.474	0.077	0.015	0.042	0.000000	0.000000	-1815.74	907
2	FID		ACIS-I-6	7.21	7401	1.000	0.219	0.145	0.031	0.050	0.000000	0.000000	398.45	1551
3	GUIDE	used	1032983104	8.90	14786	1.000	0.200	0.073	0.111	0.177	256.914293	-44.699956	-1099.63	-619
4	GUIDE	used	1033000208	7.75	14800	1.000	-0.119	-0.181	0.109	0.177	256.502750	-44.372681	-2060.37	638
5	GUIDE	used	1033111224	8.92	14785	1.000	-0.272	-0.273	0.228	0.337	257.844751	-44.847109	1223.19	-1352
6	GUIDE	used	1091569256	8.37	14794	1.000	0.018	0.159	0.101	0.165	257.146819	-45.037377	-608.08	-1878
7	GUIDE	used	1091578128	8.58	14789	1.000	0.165	0.240	0.241	0.335	257.198938	-45.154577	-511.02	-2309

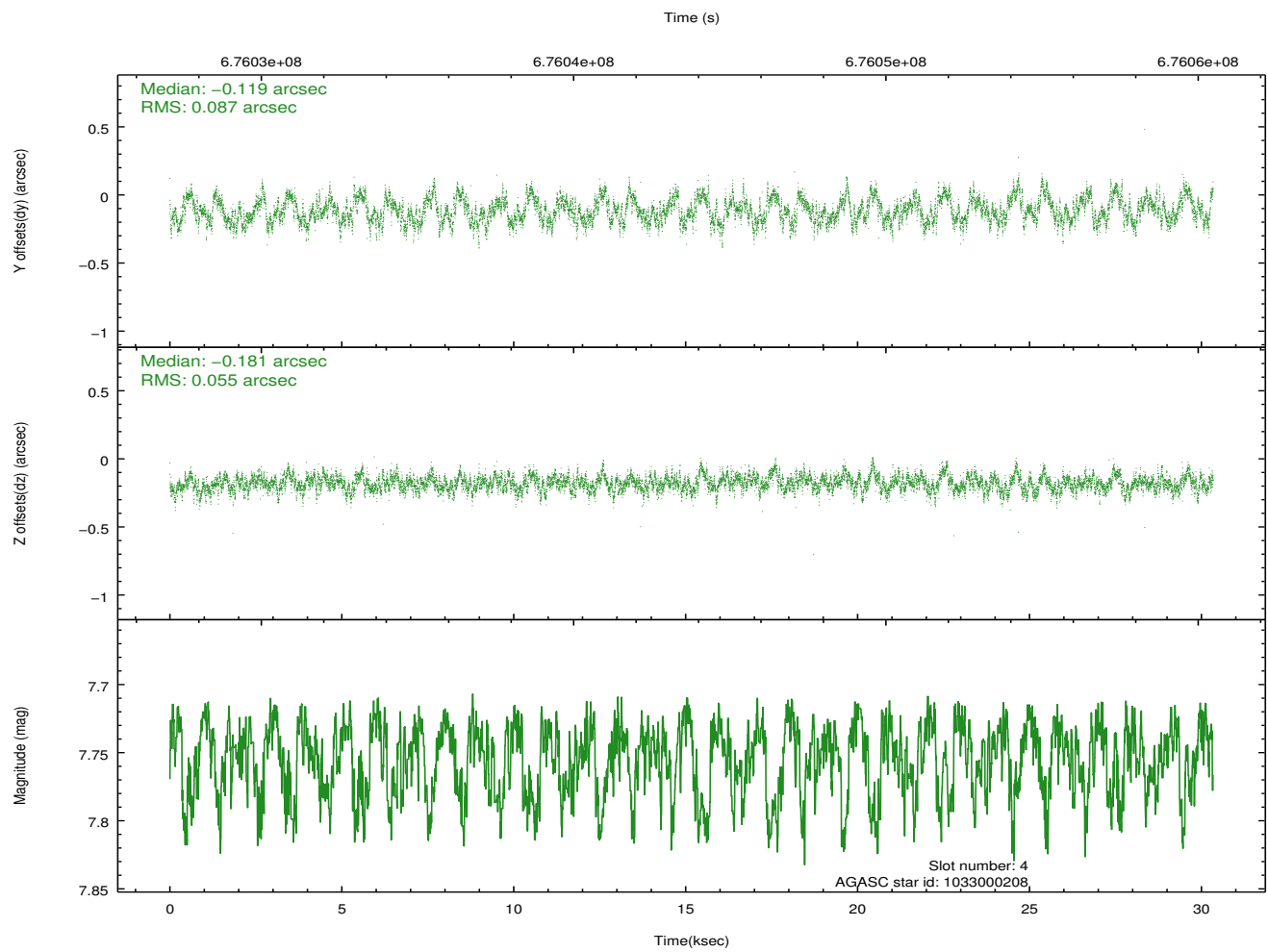
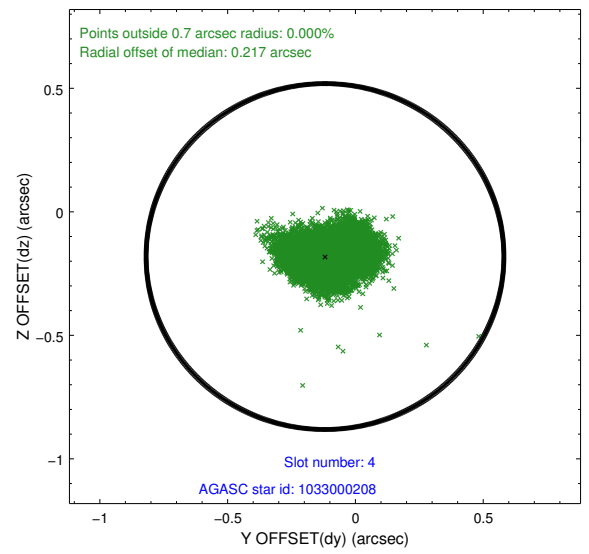
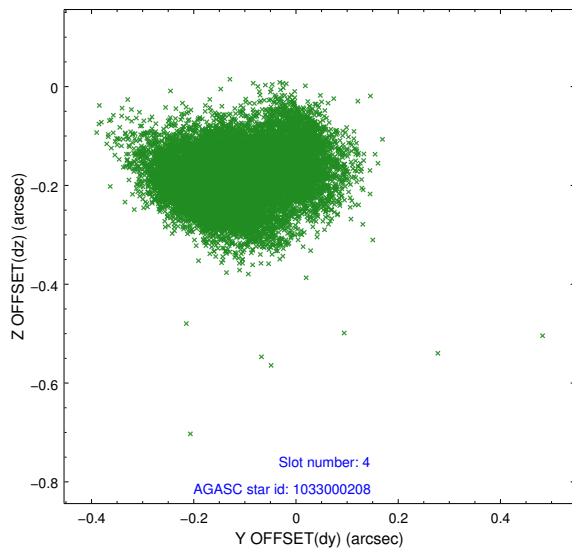
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2.4 Star Slots

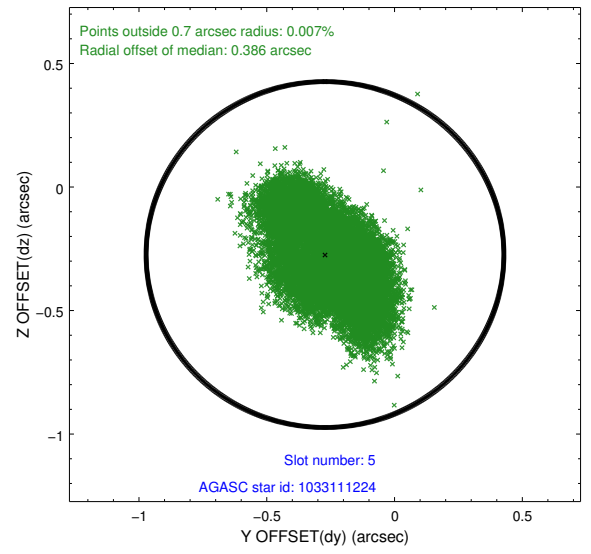
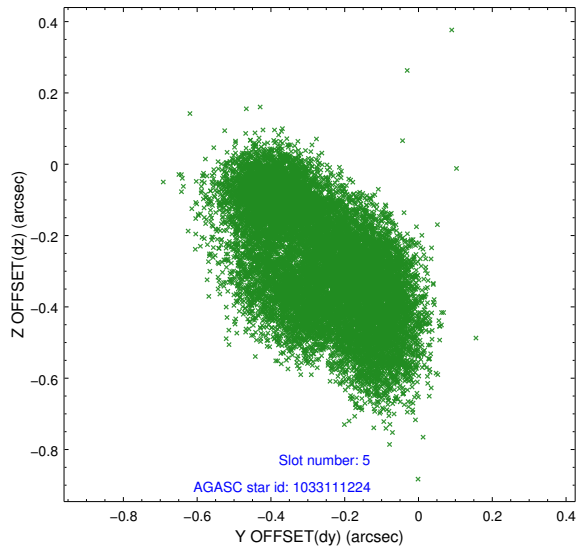
2.4.1 Slot 3



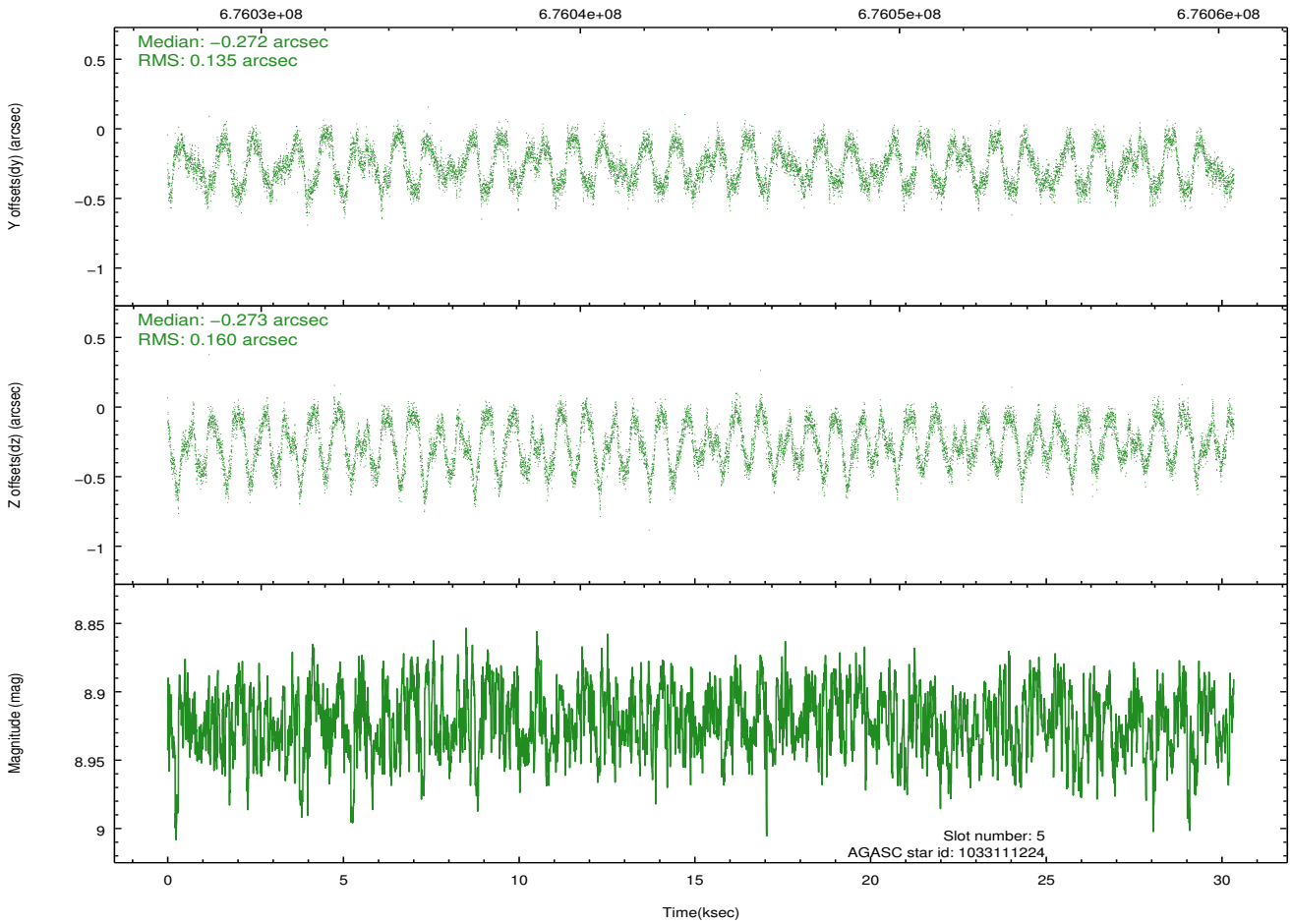
2.4.2 Slot 4



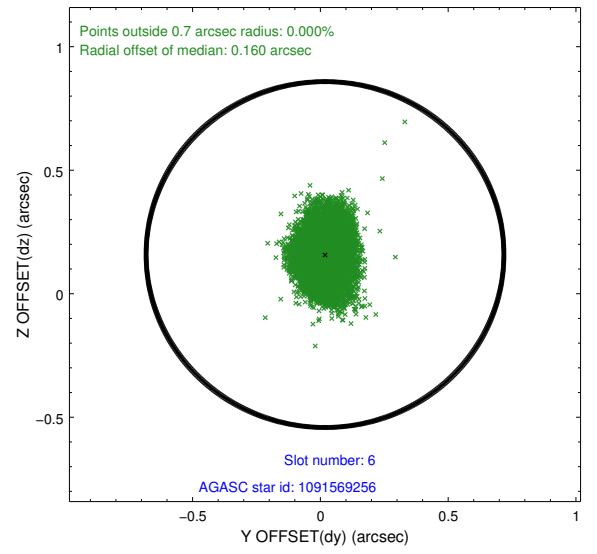
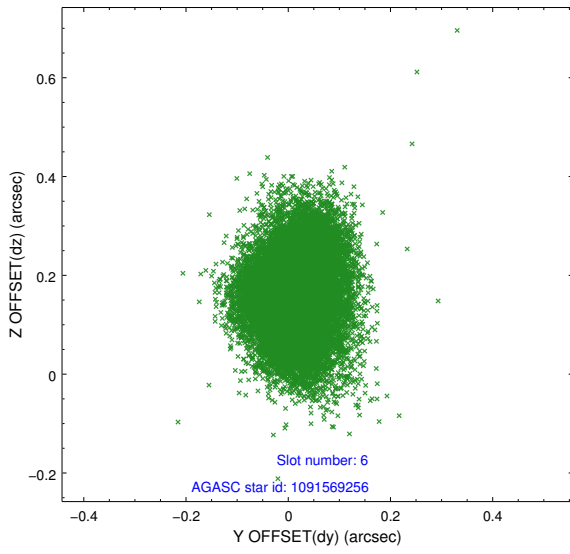
2.4.3 Slot 5



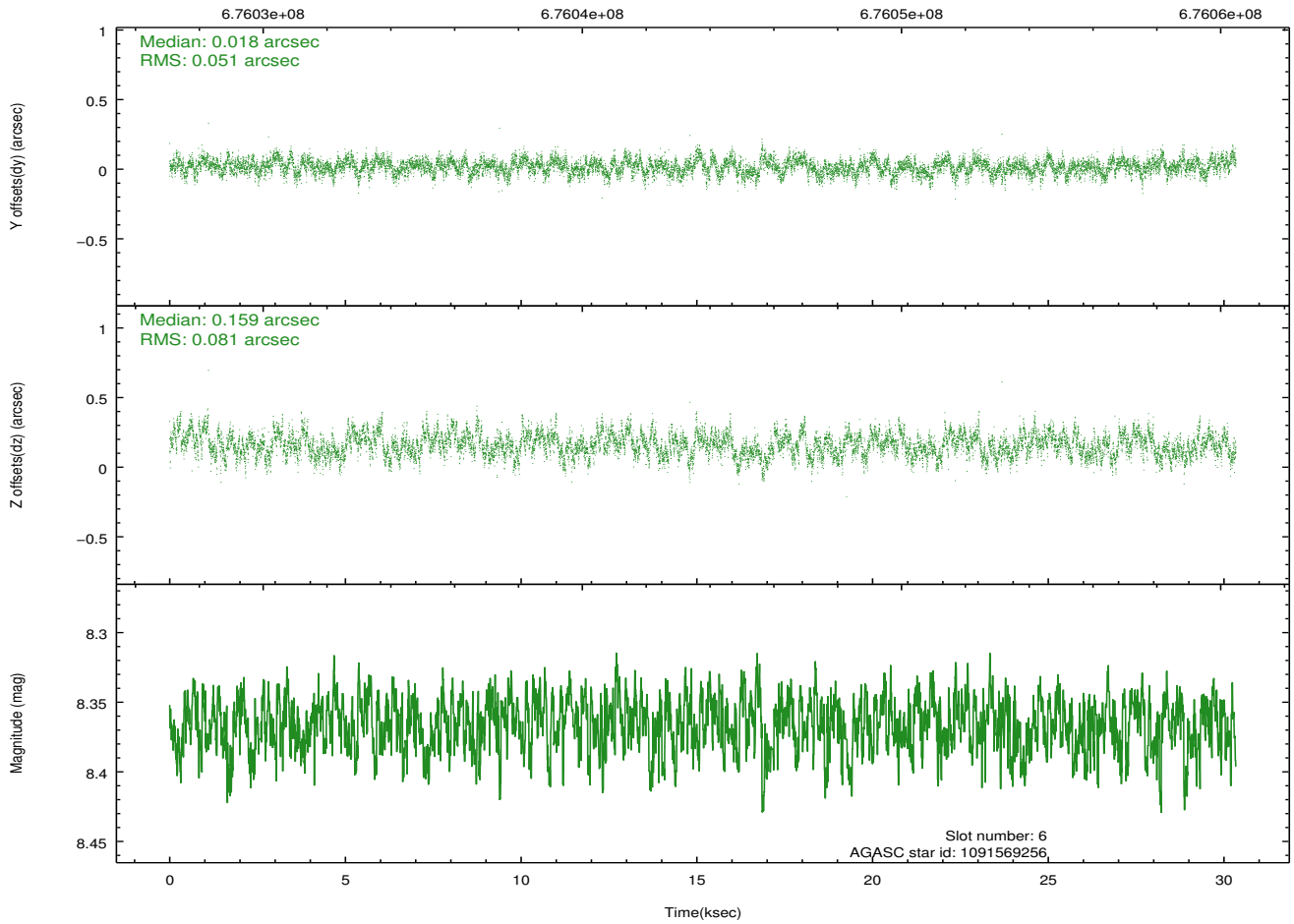
Time (s)



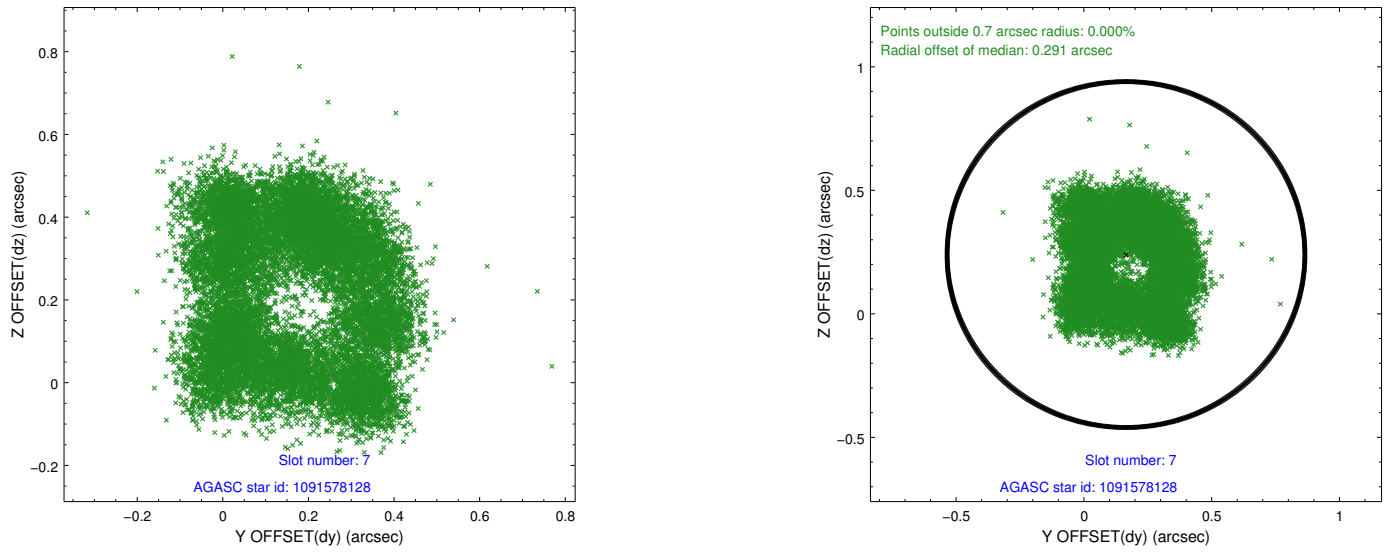
2.4.4 Slot 6



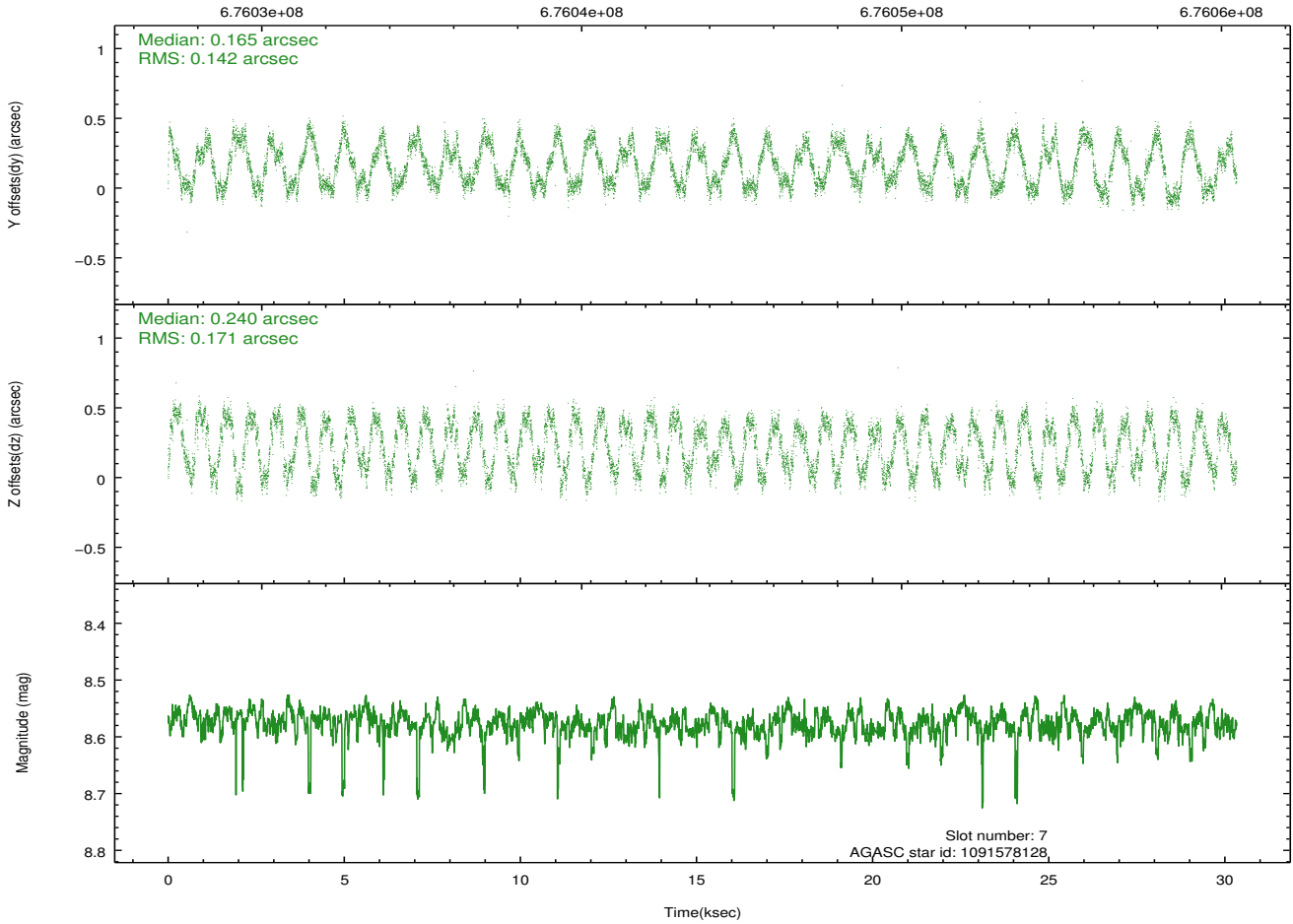
Time (s)



2.4.5 Slot 7

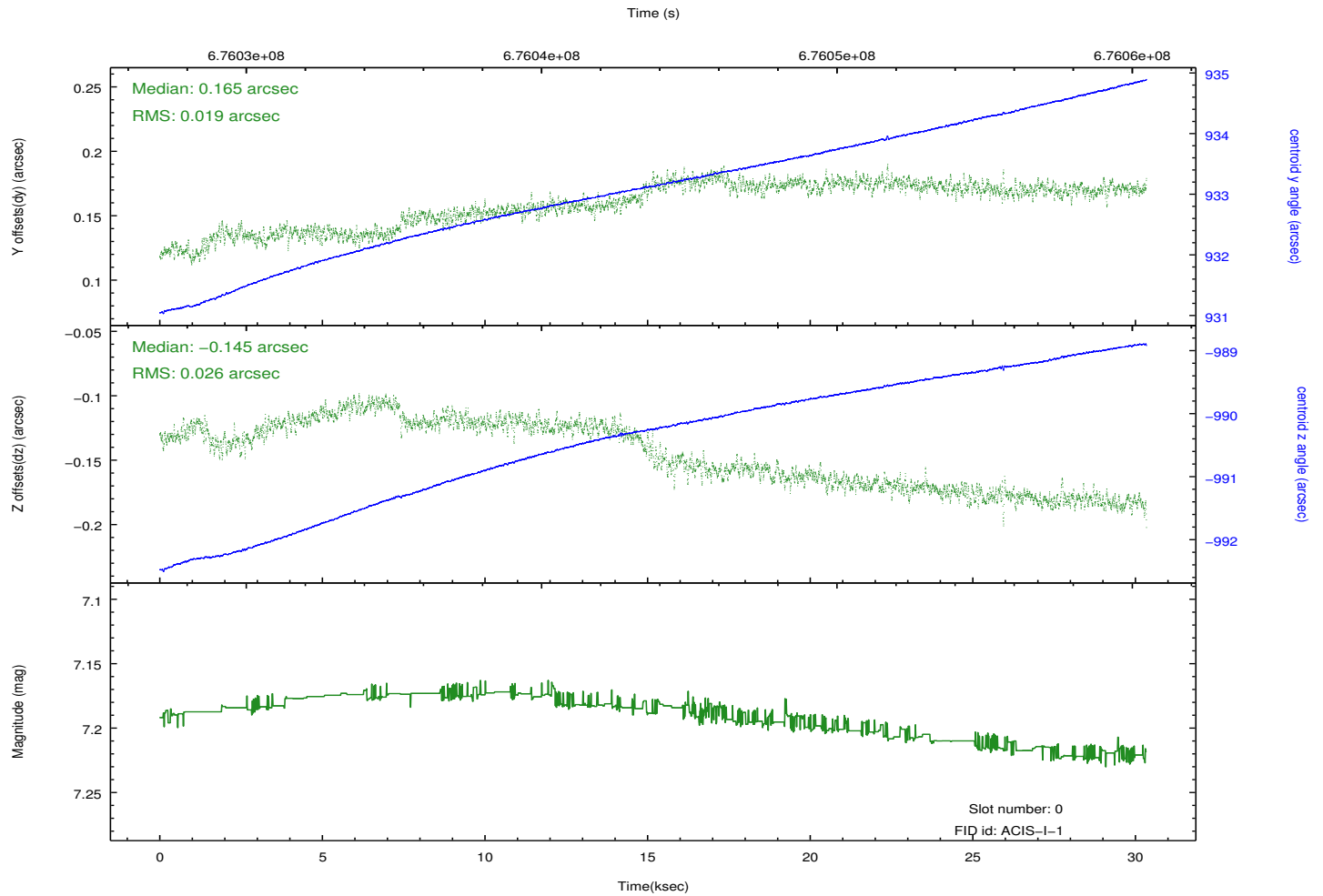
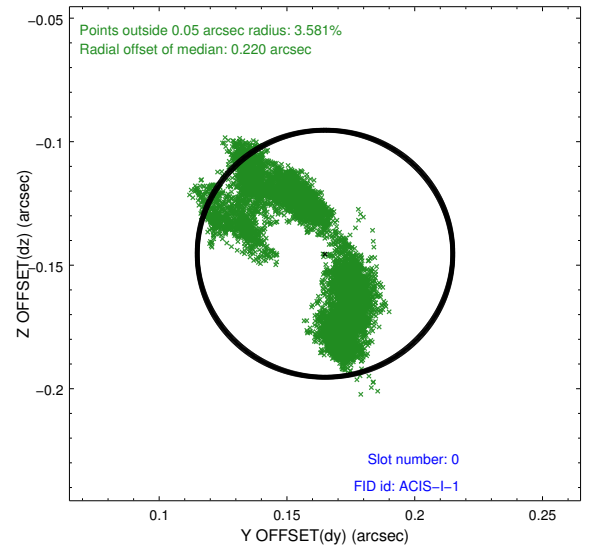
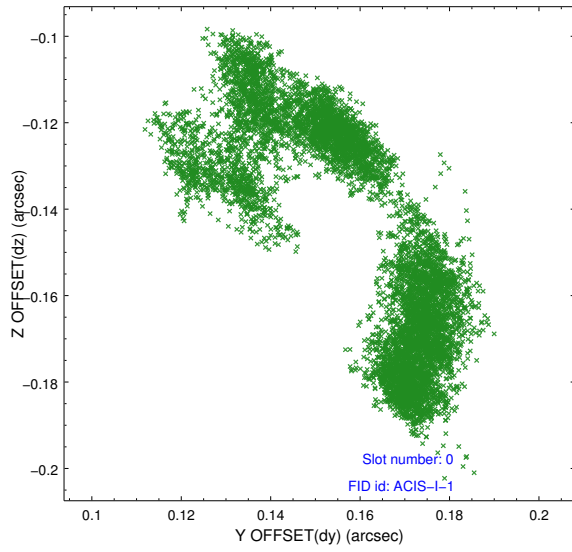


Time (s)

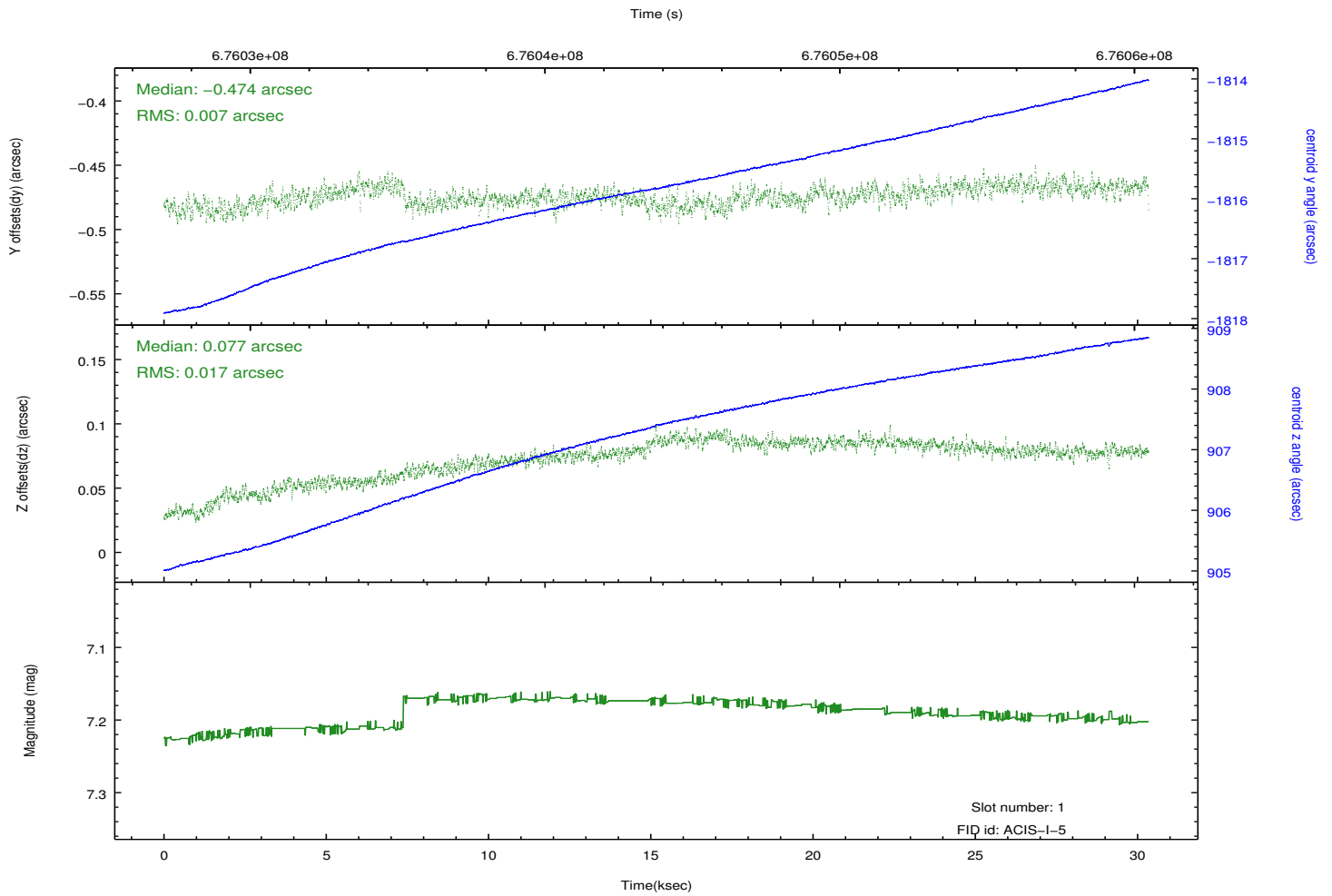
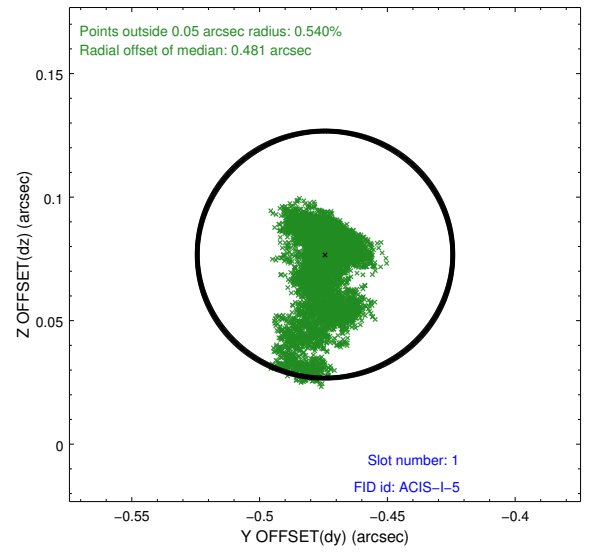
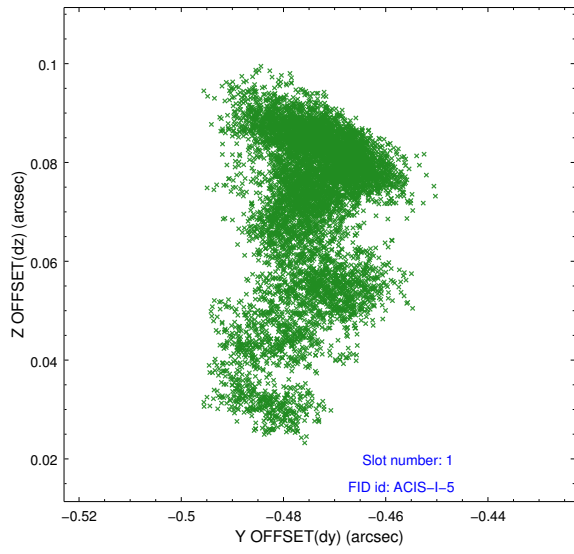


2.5 FID Slots

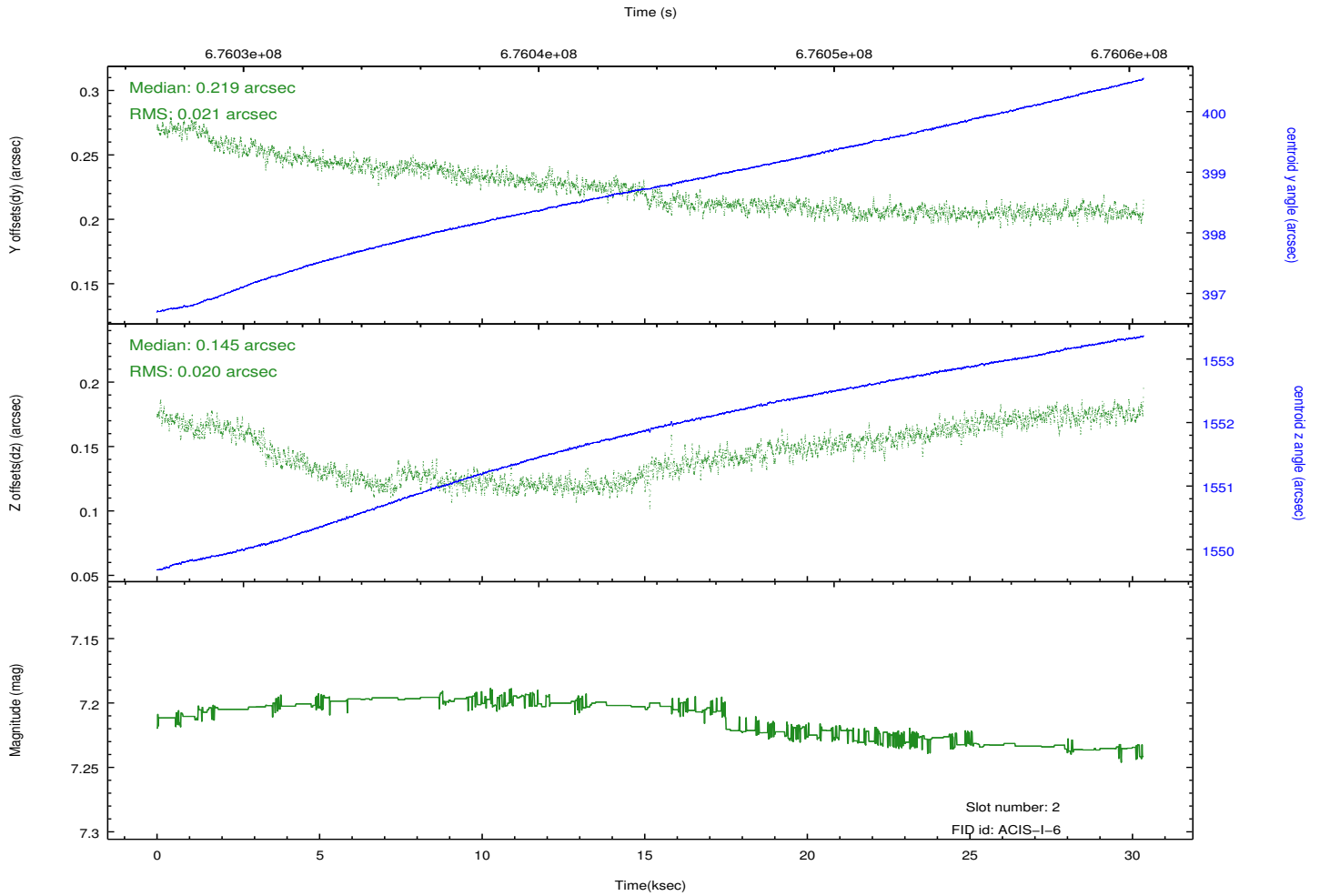
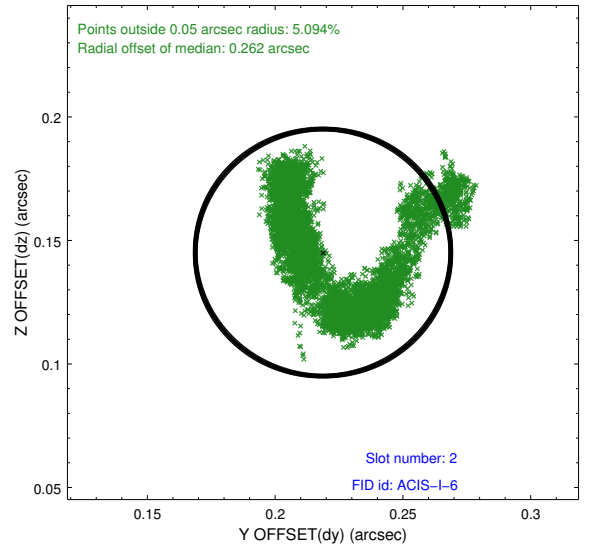
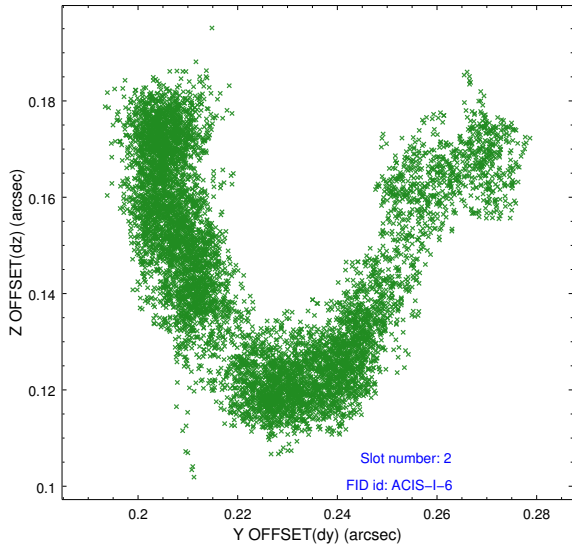
2.5.1 Slot 0



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)	2019.06.05
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.296259232879

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., -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

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.