V&V Reference Report
L2 ASCDS Version : 10.8.1

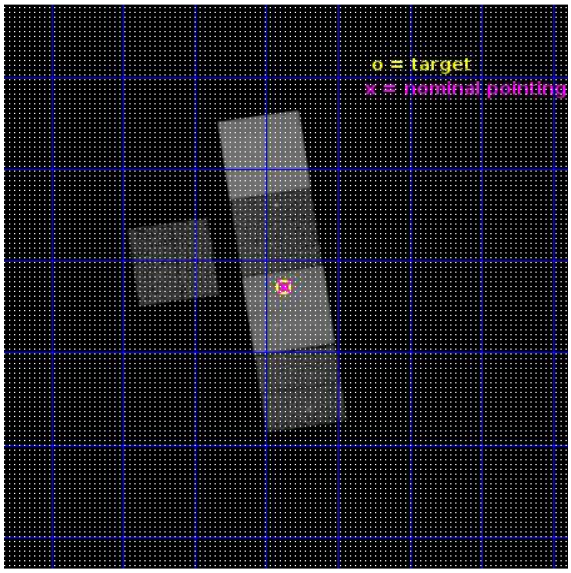
Observation 21390 - L2 Version 1
Chandra X-Ray Center

L2 Processing Date : Oct 12 2019

Contents

1 Front

seq_num	901411	Sequence number
obs_id	21390	Observation id
title	X-ray insight into the recent death of stars	Proposal title
observer	Katie Auchettl	Principal investigator
object	AT2019pev	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	67.344667	Observer's specified target RA [deg]
dec_targ	0.61875	Observer's specified target Dec [deg]
ra_nom	67.341658905038	Nominal RA [deg]
dec_nom	0.6202301084683	Nominal Dec [deg]
roll_nom	81.425700924348	Nominal Roll [deg]
revision	1	Processing version of data
ontime	30041.387448549	Sum of GTIs [s]
livetime	29648.874605386	Livetime [s]
ontime2	30041.223288536	Sum of GTIs [s]
ontime5	30041.346408606	Sum of GTIs [s]
ontime6	30041.305368543	Sum of GTIs [s]
ontime7	30041.387448549	Sum of GTIs [s]
ontime8	30041.264328599	Sum of GTIs [s]
l2events	377356	Number of level 2 events

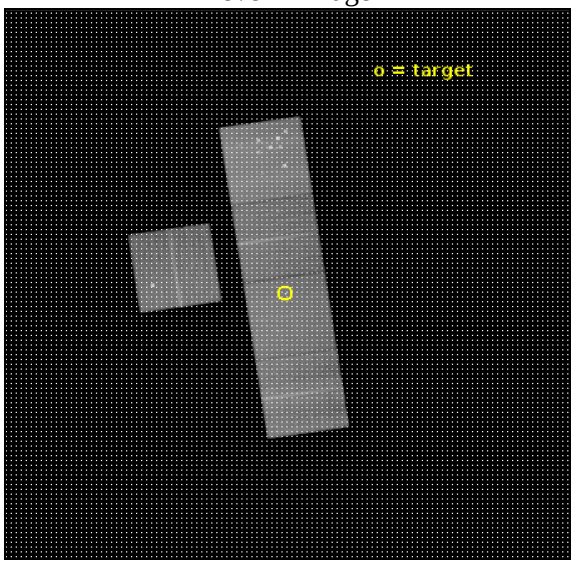


2 OBI

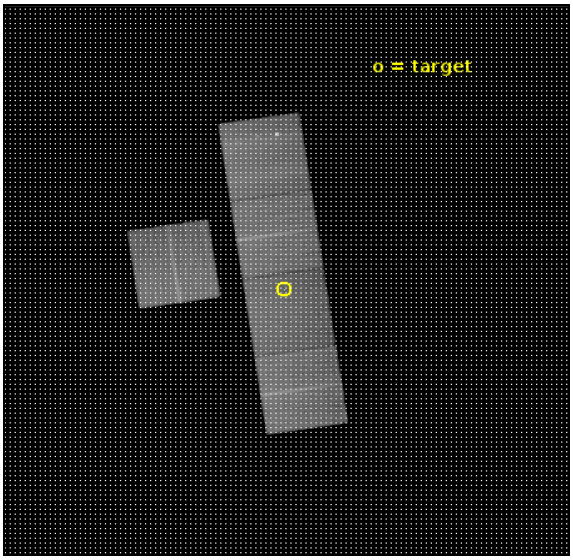
2.1 OBI

2.1.1 Images

Level 1 Image

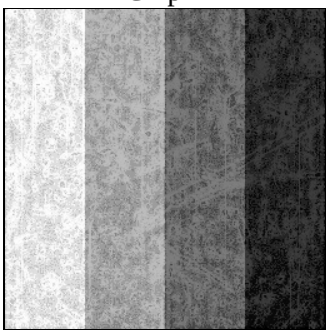


Level 1 Bad Events

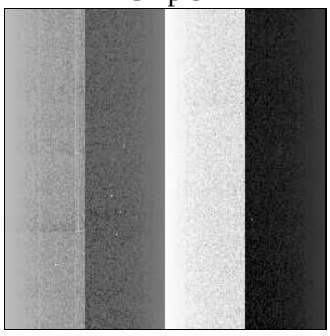


2.1.2 Bias

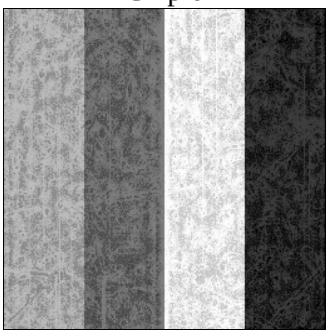
Chip 2



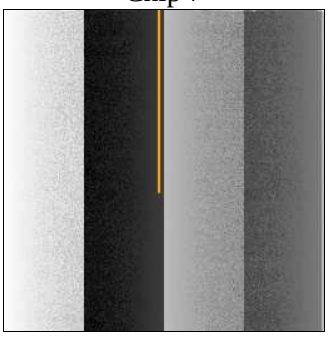
Chip 5



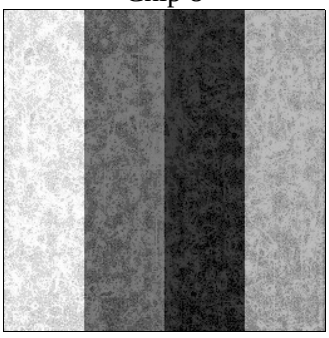
Chip 6



Chip 7



Chip 8



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.8.1	Processing system revision
caldbver	4.8.4.2	
date	2019-10-12T14:56:17	Date and time of file creation
revision	1	Processing version of data

sched_exp_time	30000.326000	[s] Scheduled observation exposure time
ontime	30041.387448549	Sum of GTIs [s]
ontime2	30041.223288536	Sum of GTIs [s]
ontime5	30041.346408606	Sum of GTIs [s]
ontime6	30041.305368543	Sum of GTIs [s]
ontime7	30041.387448549	Sum of GTIs [s]
ontime8	30041.264328599	Sum of GTIs [s]
l1events	1585192	Number of level 1 events

2.1.4 Events

	ccd 2	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	258404	432643	259689	320722	313734
rejected events	225770	218719	231956	179835	237895
rejected %	87%	50%	89%	56%	75%

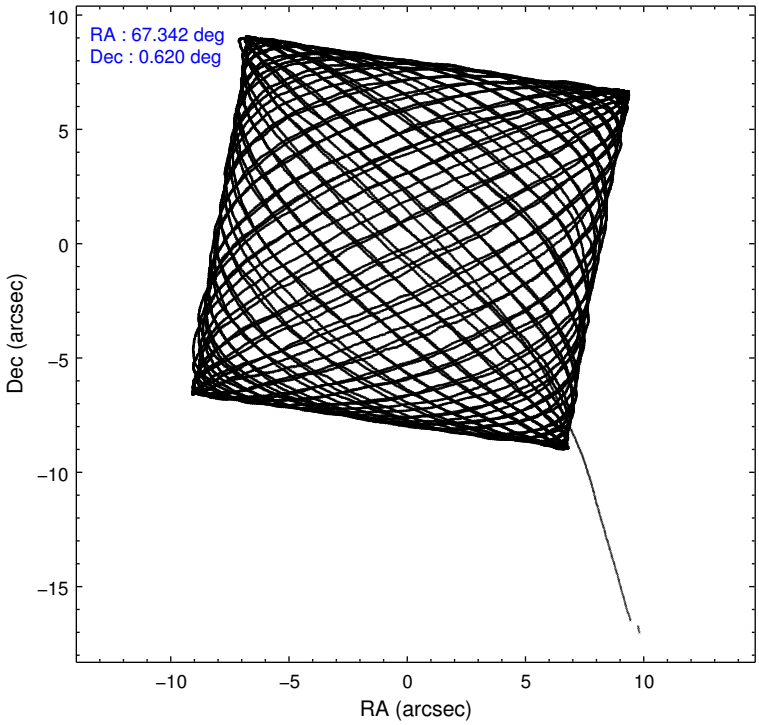
	ccd 2	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	16782	39189	7241	12866	20585
	6%	9%	2%	4%	6%
grade 1 events	175	1121	98	698	209
	0%	0%	0%	0%	0%
grade 2 events	5900	59984	8394	29424	19529
	2%	13%	3%	9%	6%
grade 3 events	2337	5567	1990	10999	7079
	0%	1%	0%	3%	2%
grade 4 events	2263	5181	1930	10765	6866
	0%	1%	0%	3%	2%
grade 5 events	8211	24150	8933	29955	14942
	3%	5%	3%	9%	4%
grade 6 events	5357	104045	8186	76863	21790
	2%	24%	3%	23%	6%
grade 7 events	217379	193406	222917	149152	222734
	84%	44%	85%	46%	70%

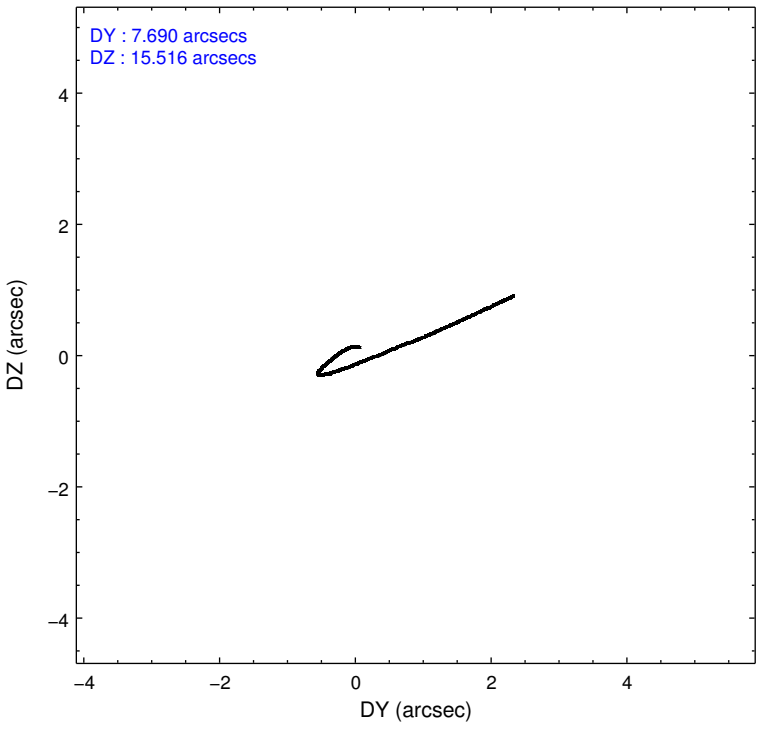
2.2 Compared Parameters

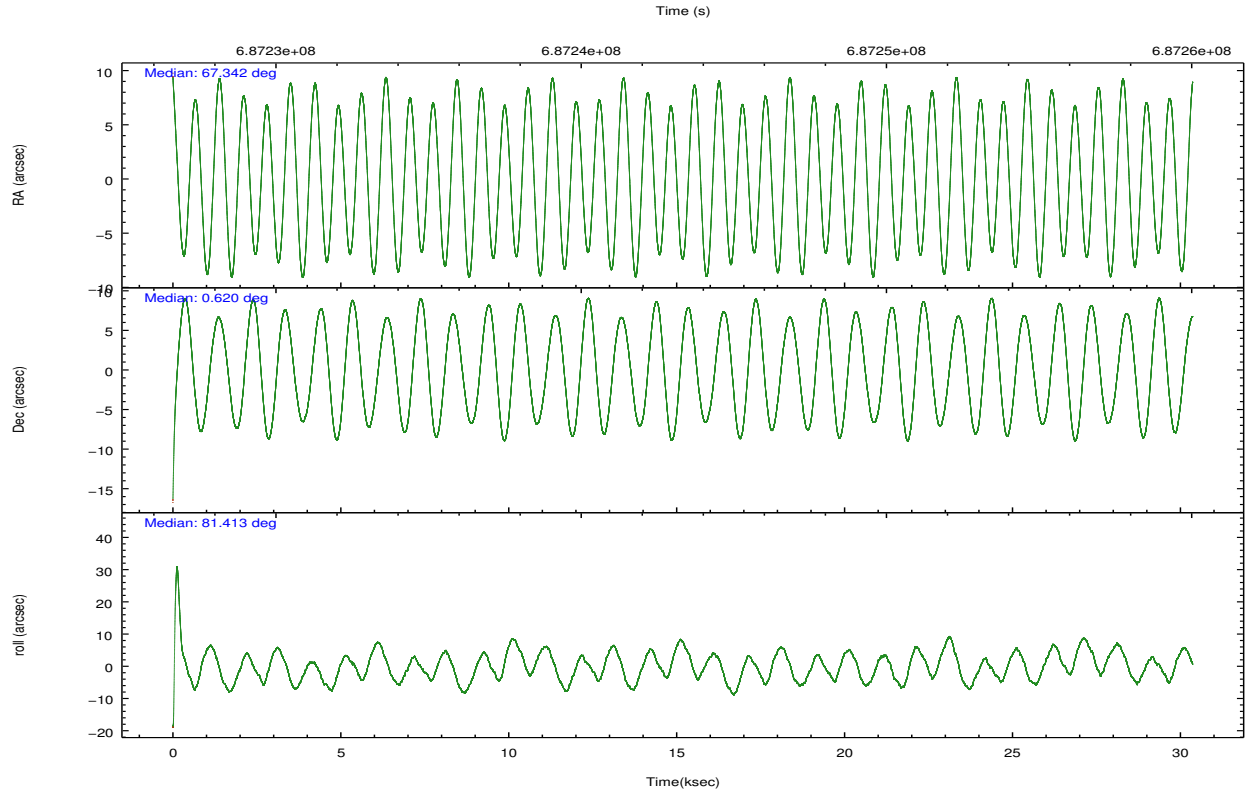
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-25678	ACIS-25678
Grating	NONE	NONE
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	67.352028	67.3416589050377
[deg] Pointing Dec	0.594813	0.6202301084683036
[deg] Pointing Roll	81.268980	81.42570092434845
[mm] SIM 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)	687228536.184000	687227504.39584
Observation start date	2019-10-12T00:47:47	2019-10-12T00:31:44
[s] Observation end time (MET)	687258536.184000	687259348.58526
Observation end date	2019-10-12T09:07:47	2019-10-12T09:22:28
Read mode	TIMED	TIMED

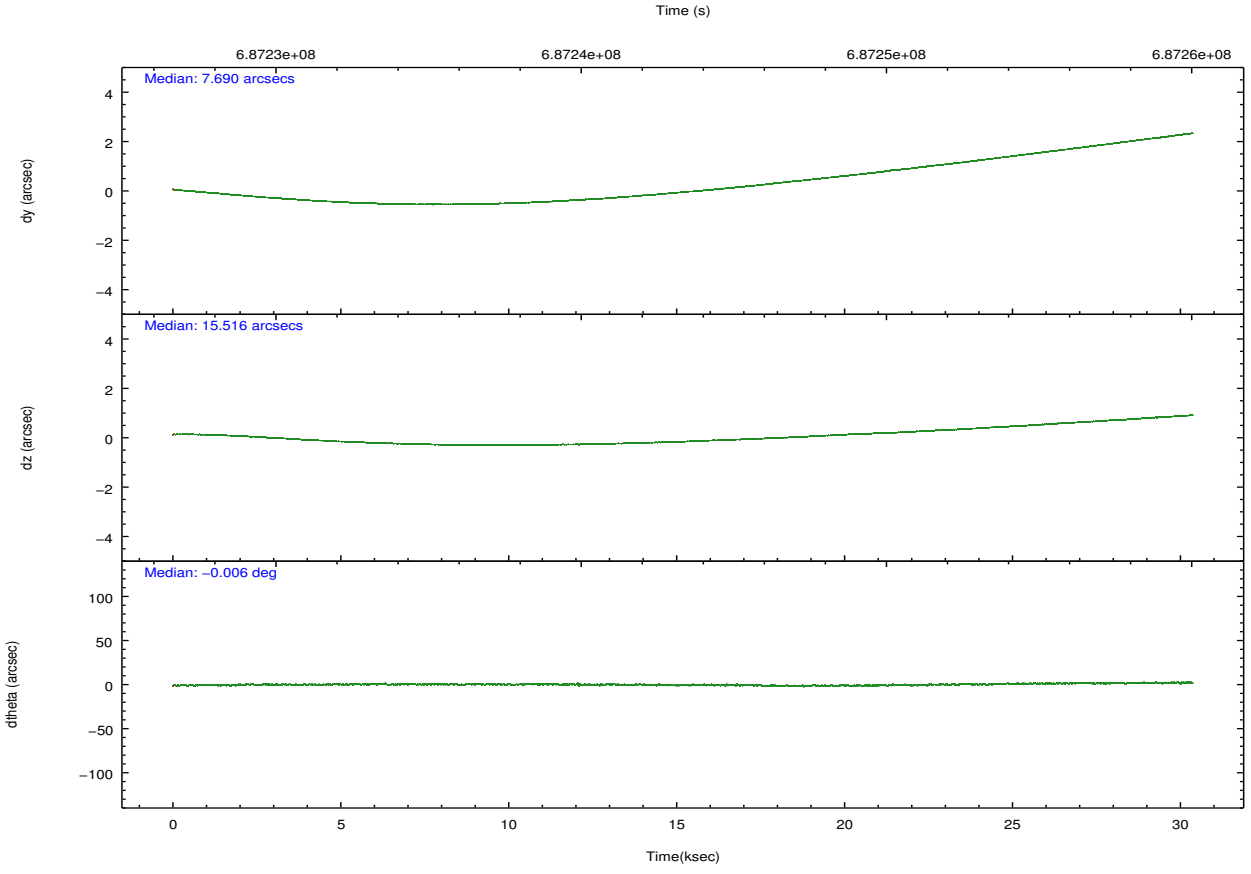
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	O2	Y
CCD I3 on	O1	N
CCD S0 on	N	N
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	N	N
Number of optional ACIS chips dropped	1	1
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.1

2.3 Aspect


RA : 67.342 deg
Dec : 0.620 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−15
−10
−5
0
5
10


DY : 7.690 arcsecs
DZ : 15.516 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
6.8723e+08
6.8724e+08
6.8725e+08
6.8726e+08
Median: 67.342 deg
Median: 0.620 deg
Median: 81.413 deg
RA (arcsec)
Dec (arcsec)
roll (arcsec)
Time(ksec)

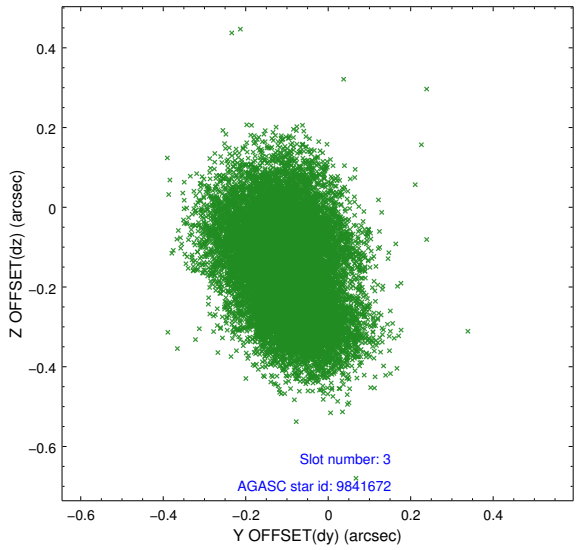

Time (s)
6.8723e+08
6.8724e+08
6.8725e+08
6.8726e+08
Median: 7.690 arcsecs
Median: 15.516 arcsecs
Median: −0.006 deg
dy (arcsec)
dz (arcsec)
dtheta (arcsec)
Time(ksec)

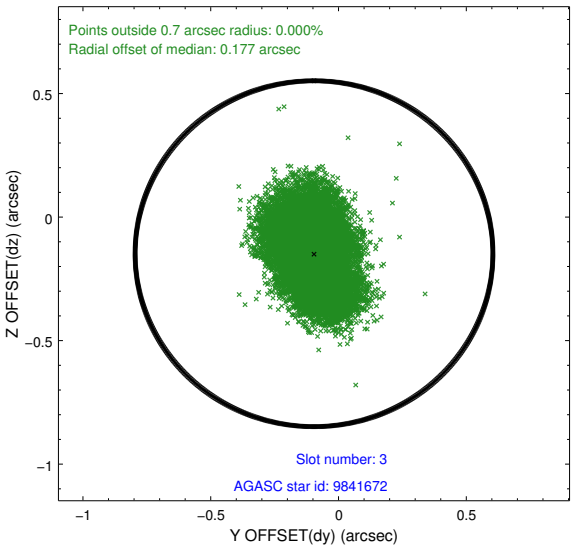
Slot Statistics

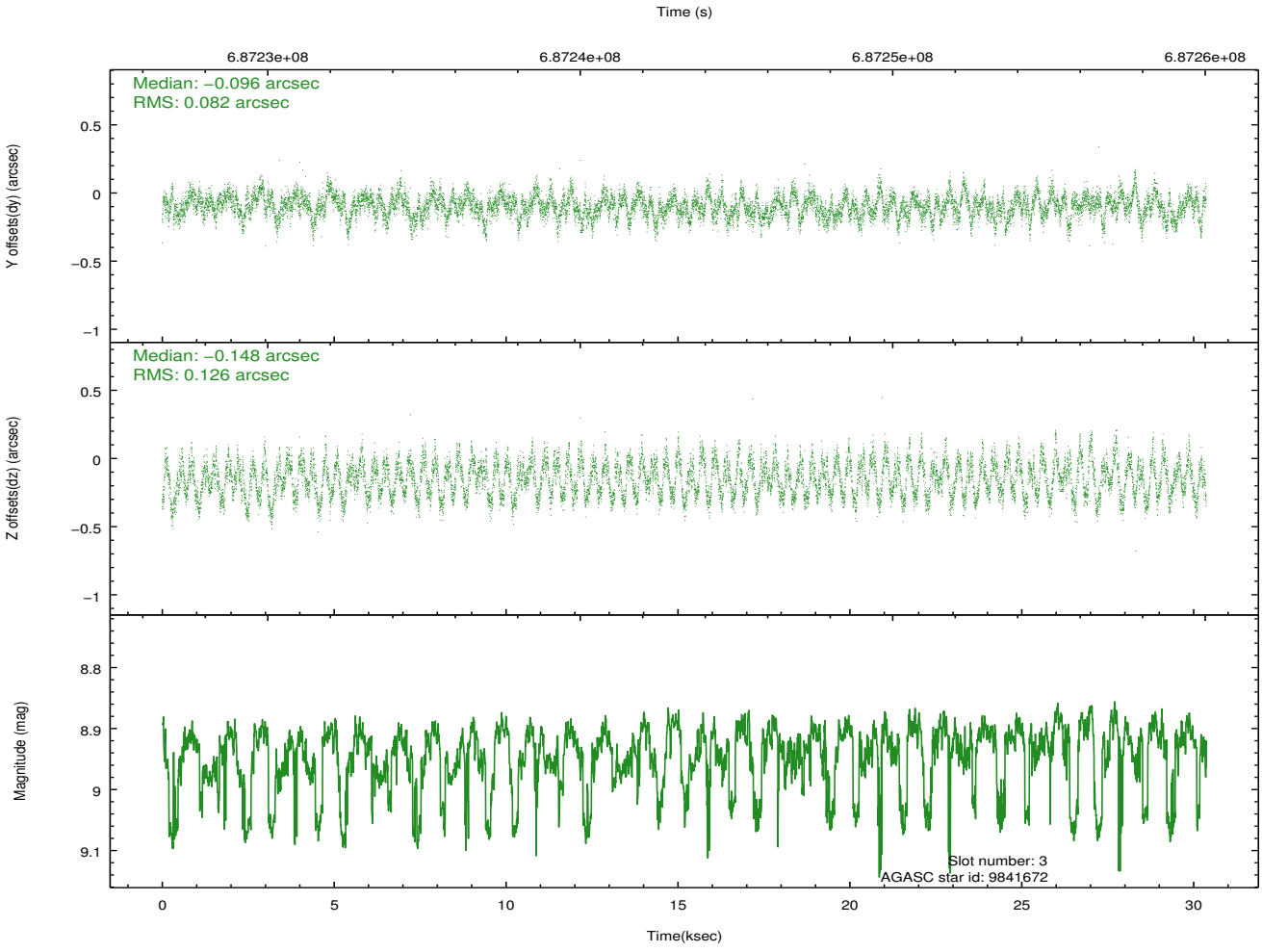
ot	status	used	id	mag	n_pts	frac_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mea
0	FID		ACIS-S-2	7.19	7406	1.000	-0.242	-0.110	0.016	0.052	0.000000	0.000000	-761.01	-1737
1	FID		ACIS-S-4	7.33	7407	1.000	0.589	0.147	0.024	0.082	0.000000	0.000000	2153.01	171
2	FID		ACIS-S-5	7.30	7407	1.000	-0.380	-0.027	0.029	0.079	0.000000	0.000000	-1813.98	165
3	GUIDE	used	9841672	8.94	14797	1.000	-0.096	-0.148	0.161	0.251	67.044190	0.886440	869.63	1254
4	GUIDE	used	9844776	9.24	14702	1.000	0.097	0.173	0.182	0.371	67.465923	0.715345	491.45	-339
5	GUIDE	used	9845336	9.08	14791	1.000	0.082	-0.105	0.272	0.410	67.151860	0.759033	472.94	798
6	GUIDE	used	10757600	7.74	14801	1.000	0.049	0.153	0.133	0.231	68.101972	0.980126	1781.94	-2457
7	GUIDE	used	10754360	9.21	14768	1.000	-0.093	-0.059	0.255	0.457	68.128628	1.121938	2301.12	-2476

2.4 Star Slots

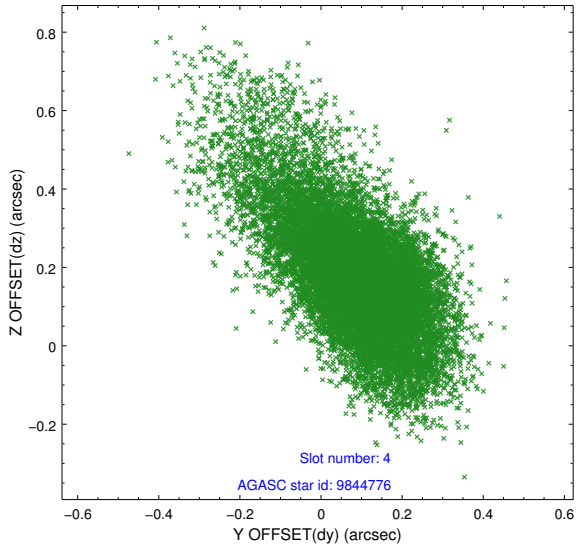
2.4.1 Slot 3

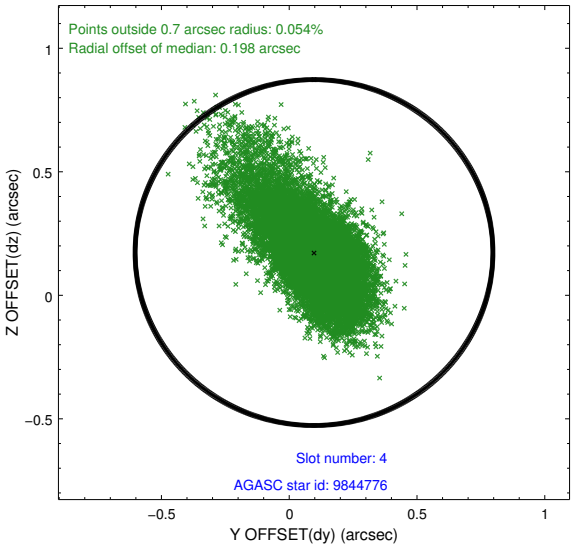


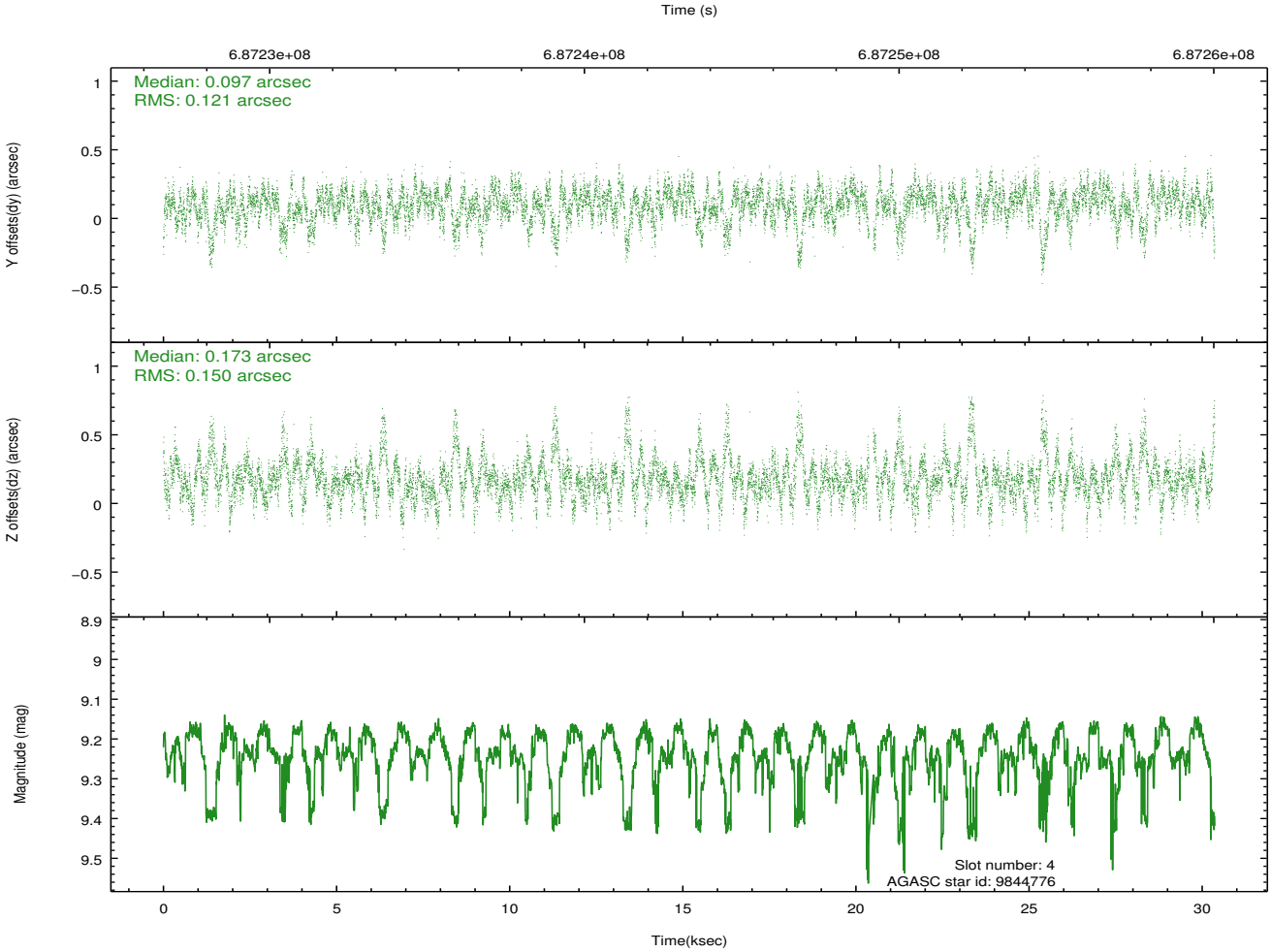




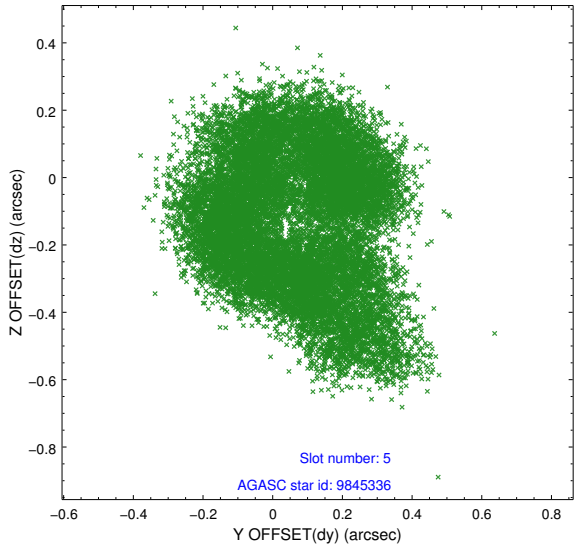
2.4.2 Slot 4

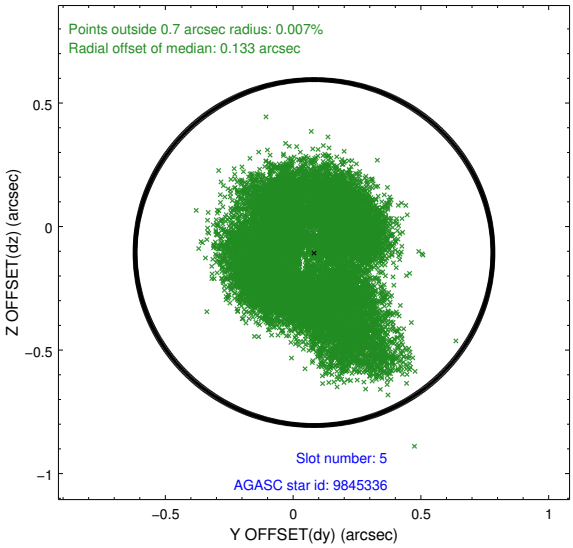

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 9844776

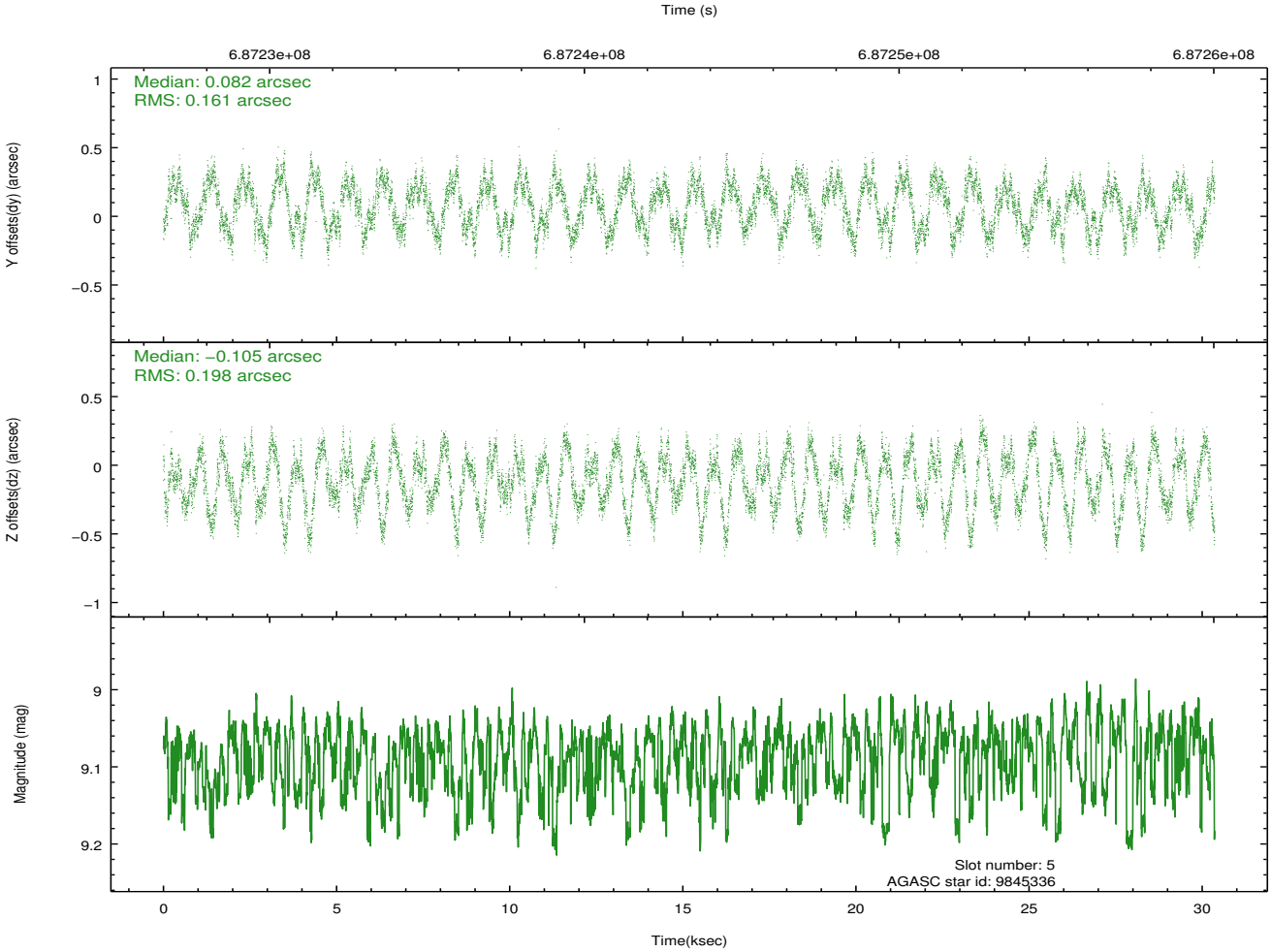

Points outside 0.7 arcsec radius: 0.054%
Radial offset of median: 0.198 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 9844776


Time (s)
Median: 0.097 arcsec
RMS: 0.121 arcsec
Y offsets(dy) (arcsec)
Median: 0.173 arcsec
RMS: 0.150 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 9844776
Time(ksec)

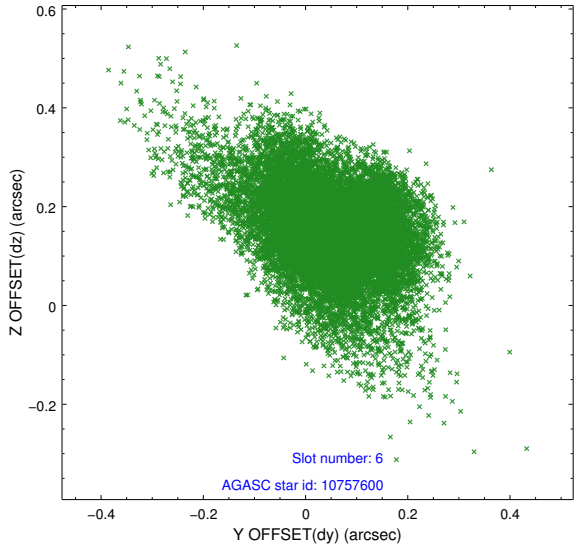
2.4.3 Slot 5

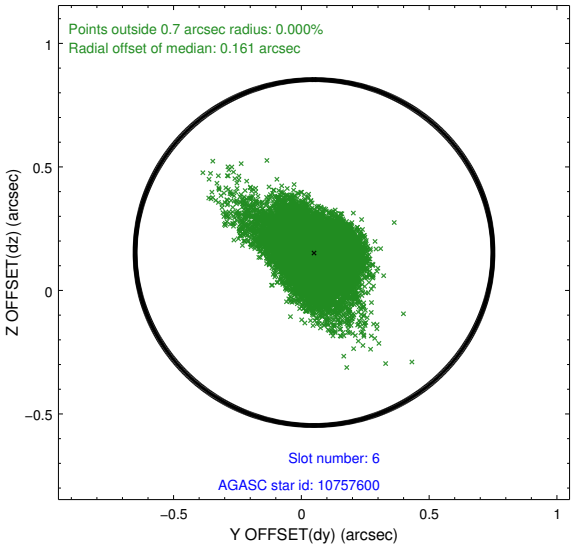

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 9845336

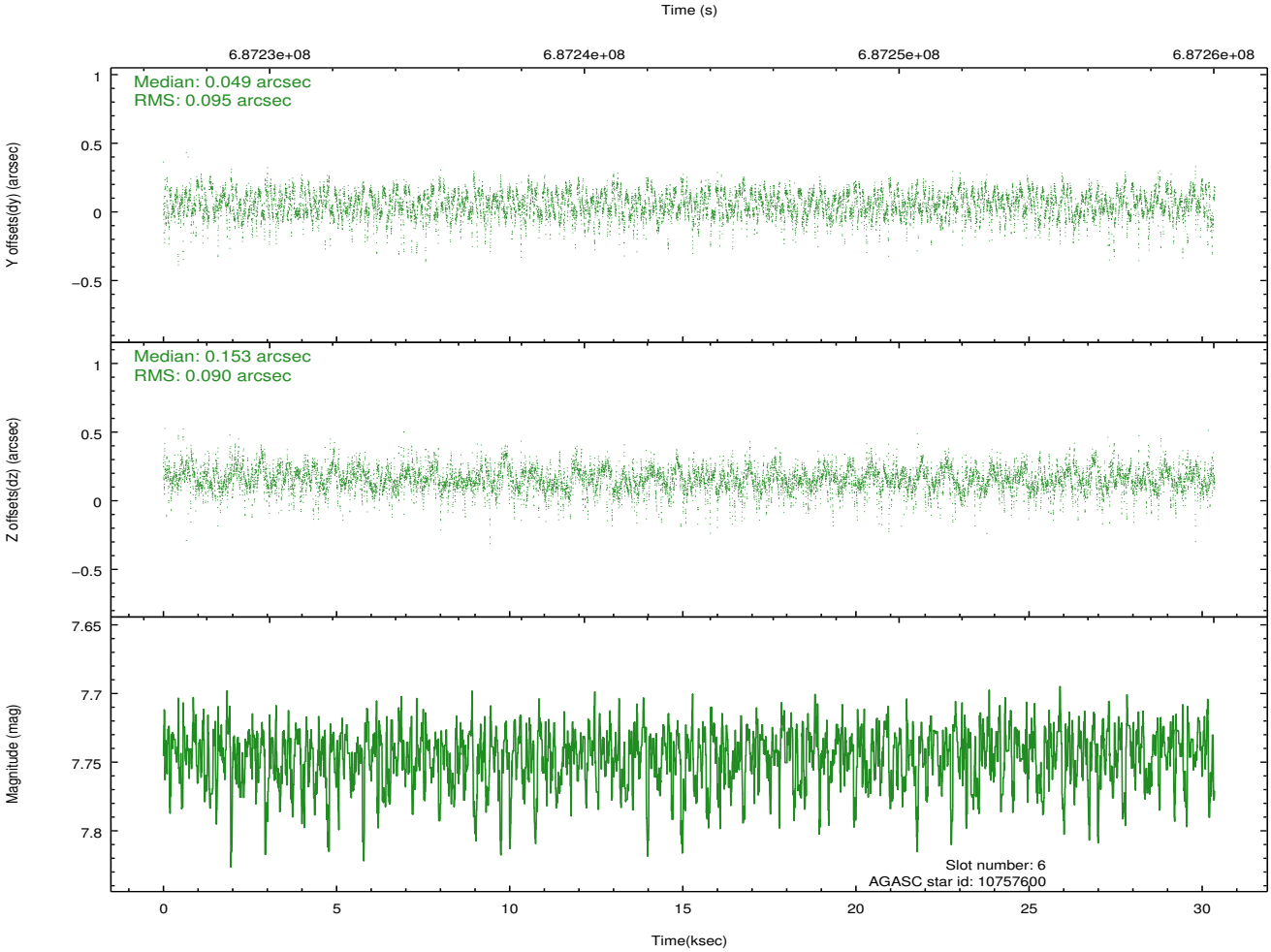

Points outside 0.7 arcsec radius: 0.007%
Radial offset of median: 0.133 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 9845336


Time (s)
6.8723e+08
6.8724e+08
6.8725e+08
6.8726e+08
Median: 0.082 arcsec
RMS: 0.161 arcsec
Y offsets(dy) (arcsec)
Median: −0.105 arcsec
RMS: 0.198 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 9845336
Time(ksec)

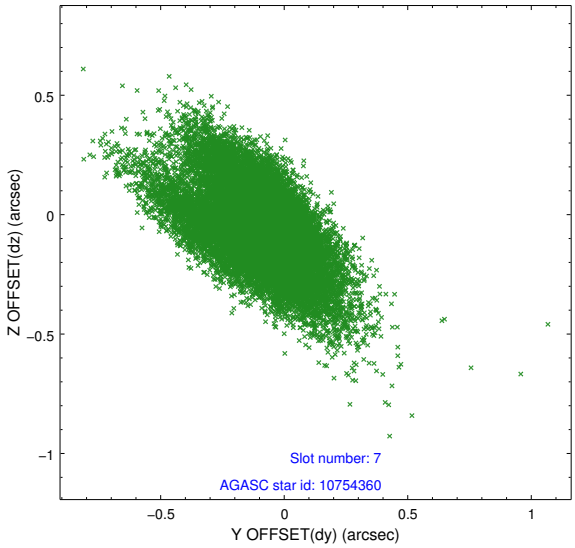
2.4.4 Slot 6

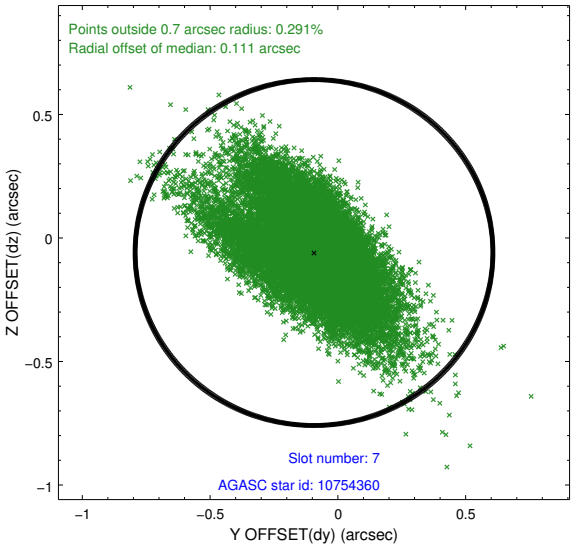

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 10757600

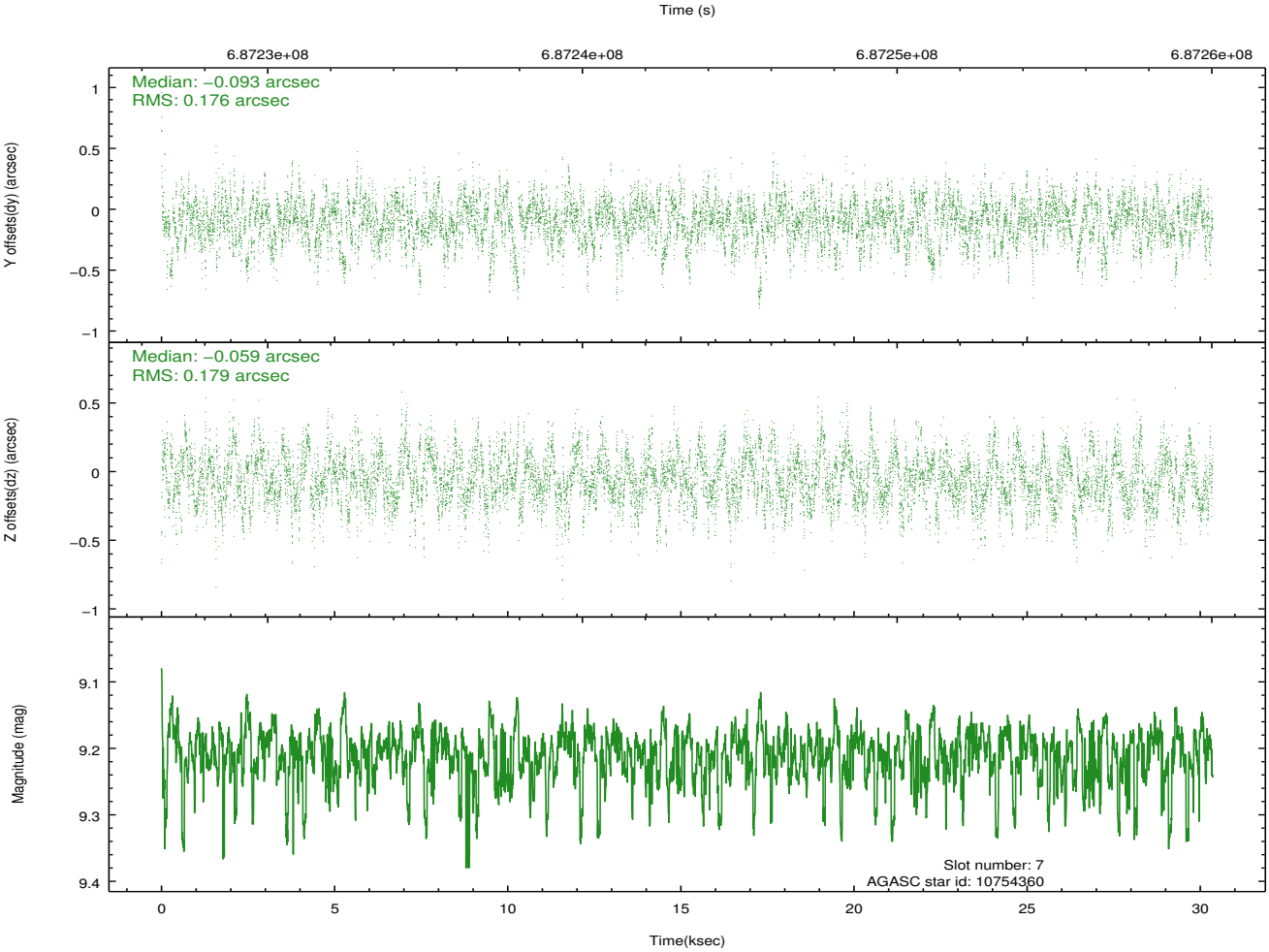

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.161 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 10757600


Time (s)
Median: 0.049 arcsec
RMS: 0.095 arcsec
Y offsets(dy) (arcsec)
Median: 0.153 arcsec
RMS: 0.090 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 10757600
Time(ksec)

2.4.5 Slot 7

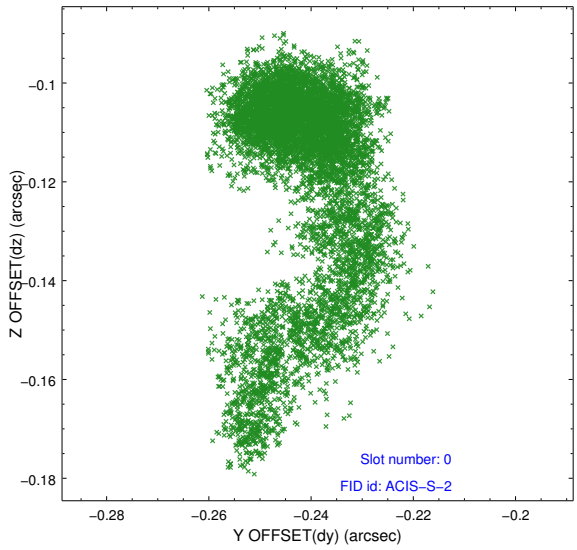

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 10754360

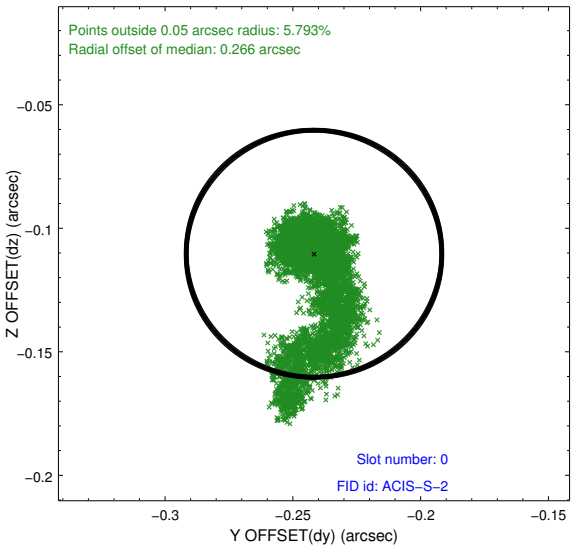

Points outside 0.7 arcsec radius: 0.291%
Radial offset of median: 0.111 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 10754360

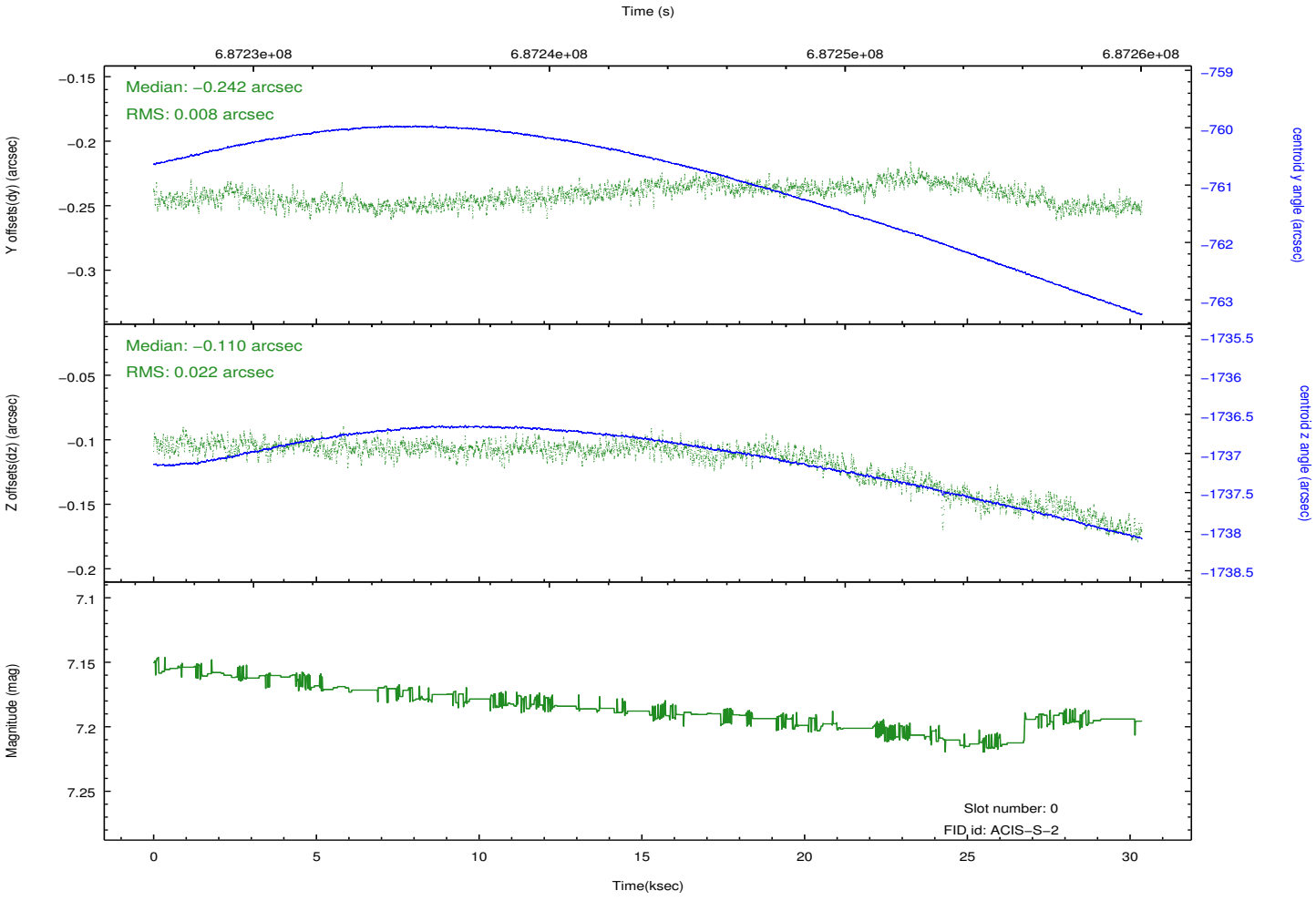

Time (s)
6.8723e+08
6.8724e+08
6.8725e+08
6.8726e+08
Median: −0.093 arcsec
RMS: 0.176 arcsec
Y offsets(dy) (arcsec)
Median: −0.059 arcsec
RMS: 0.179 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 10754360
Time(ksec)

2.5 FID Slots

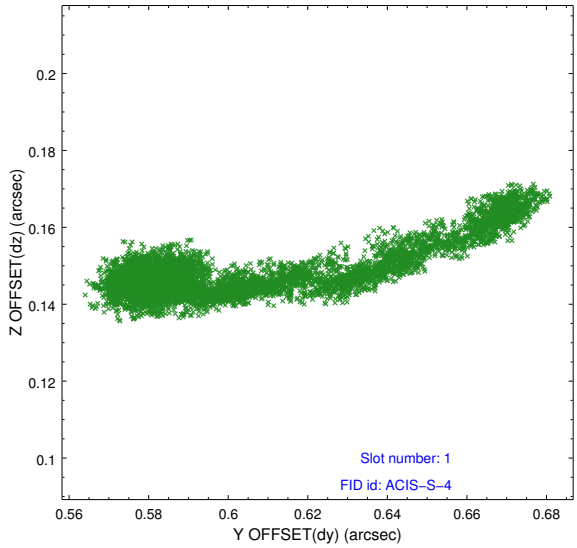
2.5.1 Slot 0

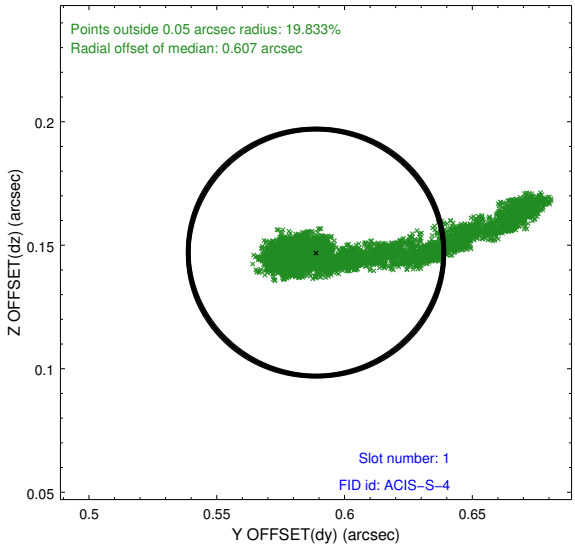


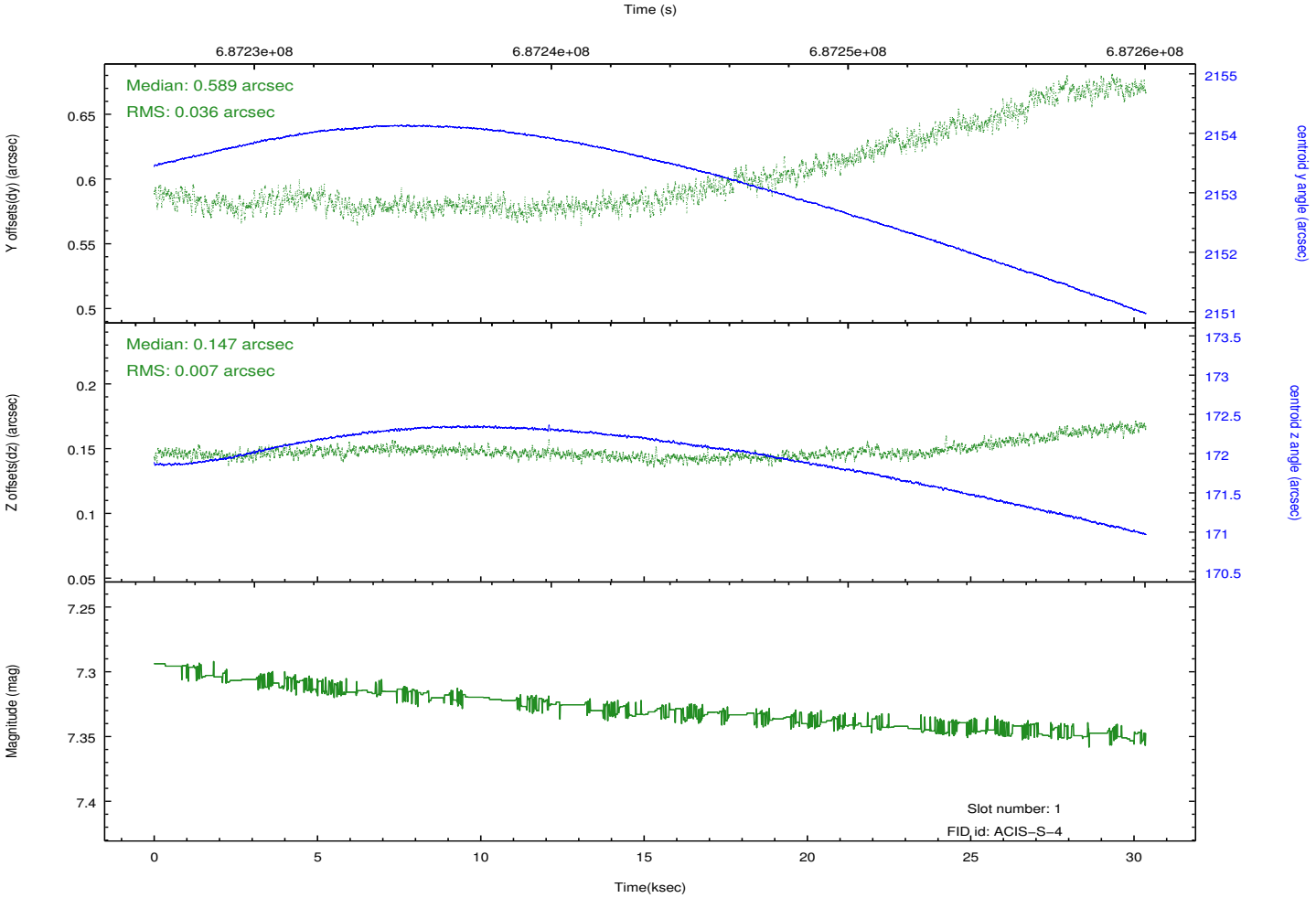




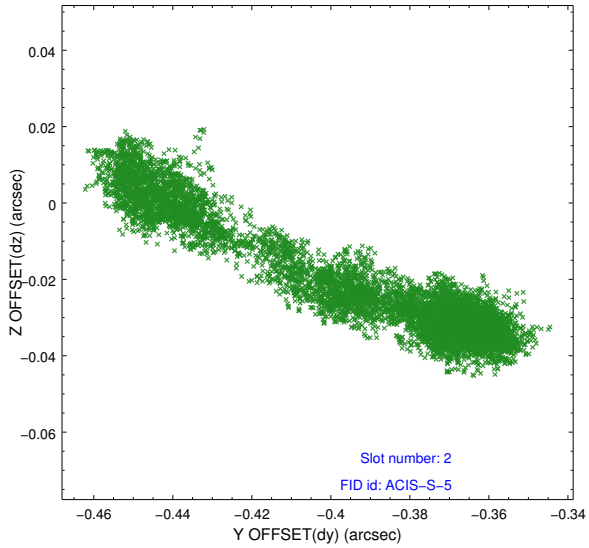
2.5.2 Slot 1

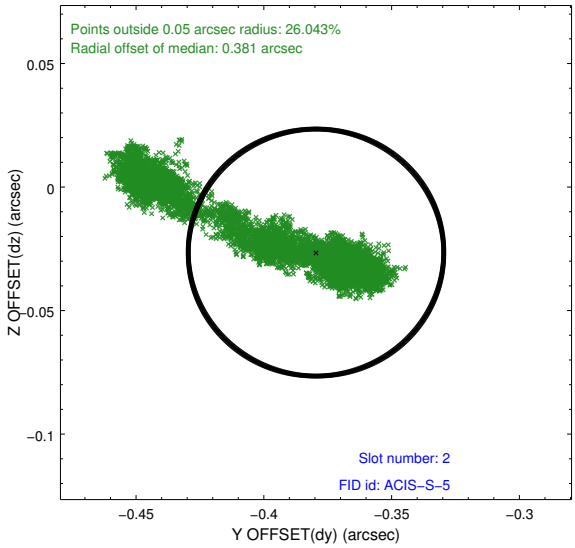

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

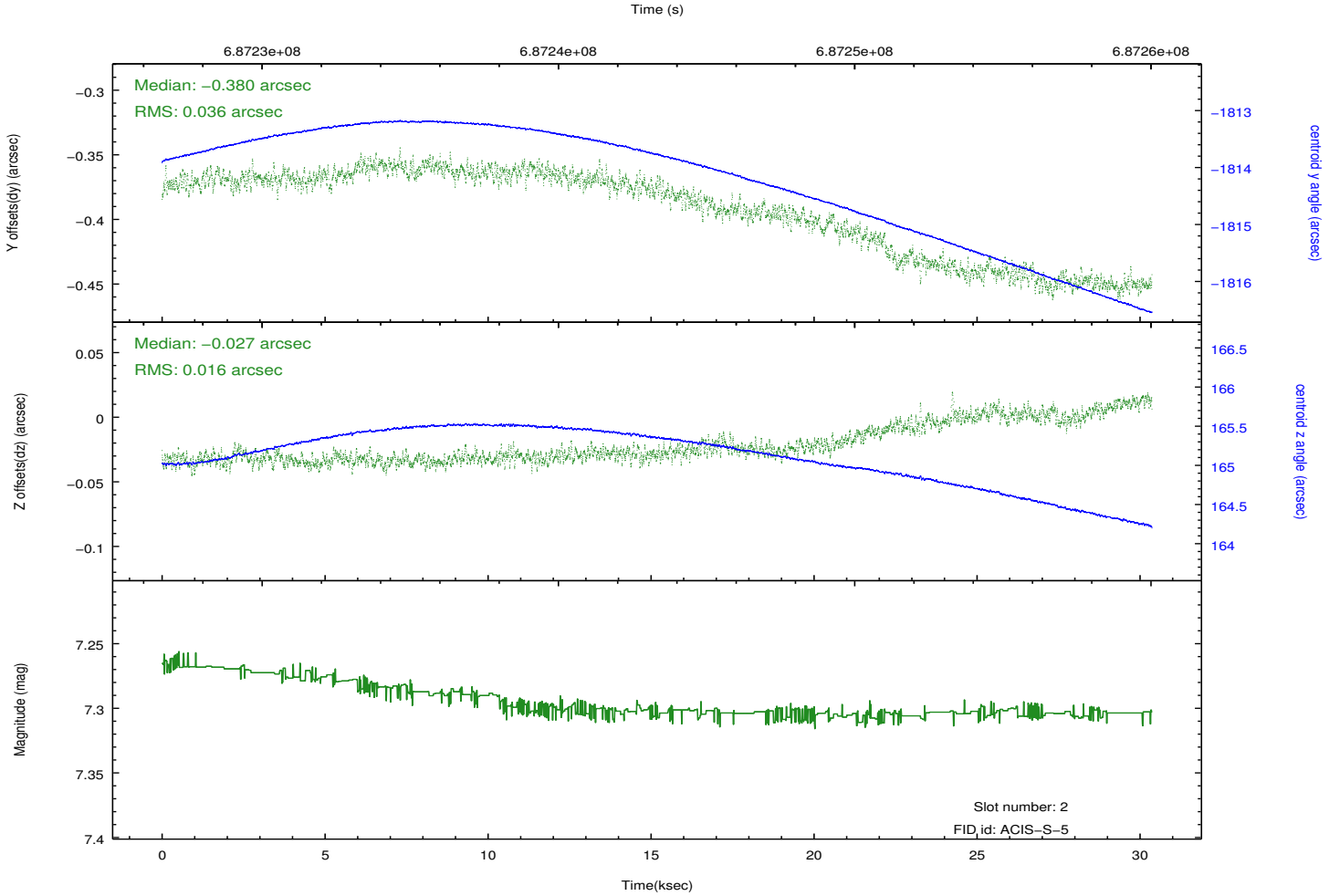

Points outside 0.05 arcsec radius: 19.833%
Radial offset of median: 0.607 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.589 arcsec
RMS: 0.036 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.147 arcsec
RMS: 0.007 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−S−4
Time(ksec)

2.5.3 Slot 2


Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Points outside 0.05 arcsec radius: 26.043%
Radial offset of median: 0.381 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.380 arcsec
RMS: 0.036 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.027 arcsec
RMS: 0.016 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2019.10.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.041387448549

A.2 Comments

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Comment for FP temp violation
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The focal plane temperature during the interval 687231191.85 -
687244382.35 (MET s) of this observation was warmer than the upper limit
for optimum calibration of the ACIS gain and spectral resolution (i.e.,
-111.0 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.
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