V&V Reference Report
L2 ASCDS Version : 8.4.5

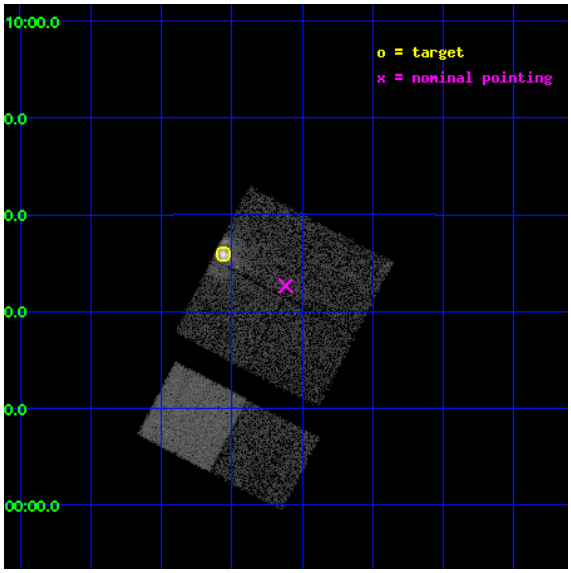
Observation 1772 - L2 Version 7
Chandra X-Ray Center

L2 Processing Date : Sep 5 2012

Contents

1 Front

seq_num	590198	Sequence number
obs_id	1772	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=-7,0,-1]	Source name
dtycycle	0	
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	278.27920664508	Nominal RA [deg]
dec_nom	-10.622598373756	Nominal Dec [deg]
roll_nom	207.56930029058	Nominal Roll [deg]
revision	7	Processing version of data
ontime	7506.589440763	Sum of GTIs [s]
livetime	7411.5364853385	Livetime [s]
ontime0	7506.5484007597	Sum of GTIs [s]
ontime1	7506.589440763	Sum of GTIs [s]
ontime2	7506.6304807663	Sum of GTIs [s]
ontime3	7506.6715207547	Sum of GTIs [s]
ontime6	7506.7536007613	Sum of GTIs [s]
ontime7	7506.712560758	Sum of GTIs [s]
l2events	63778	Number of level 2 events

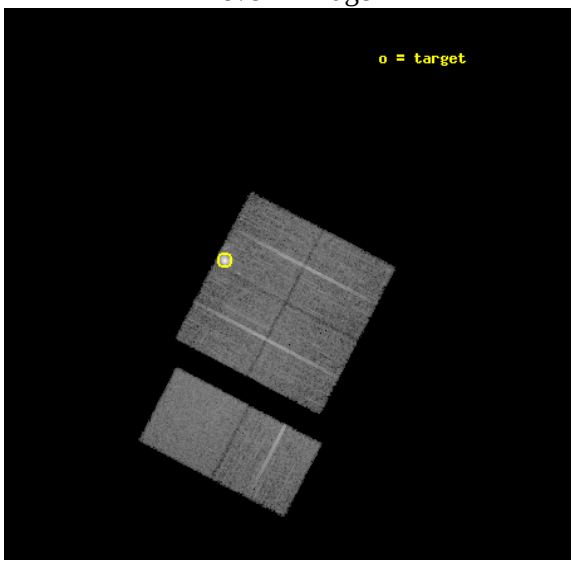


2 OBI

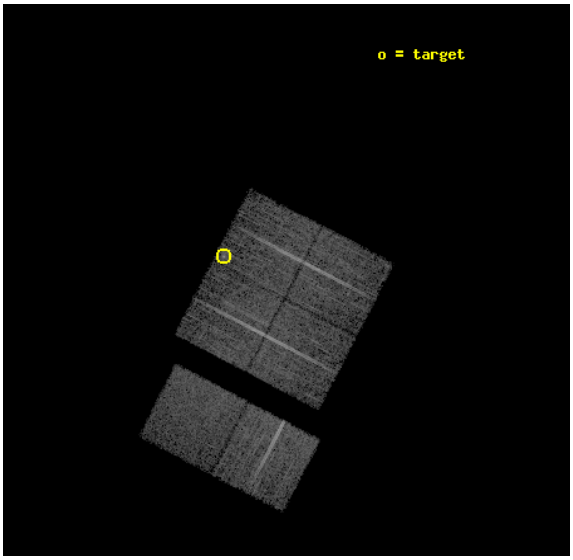
2.1 OBI

2.1.1 Images

Level 1 Image

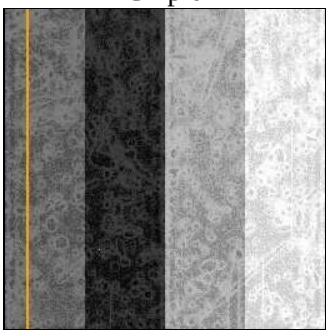


Level 1 Bad Events

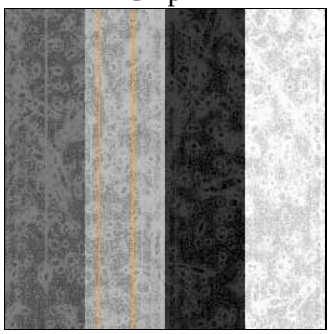


2.1.2 Bias

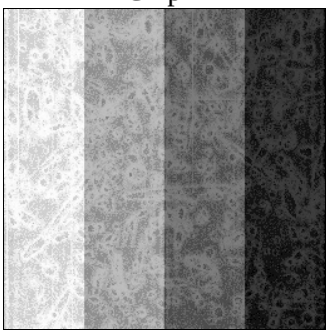
Chip 0



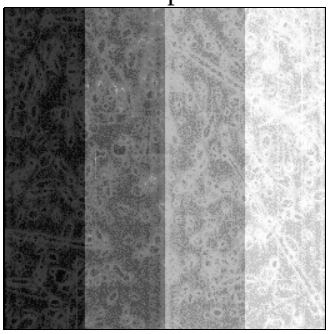
Chip 1



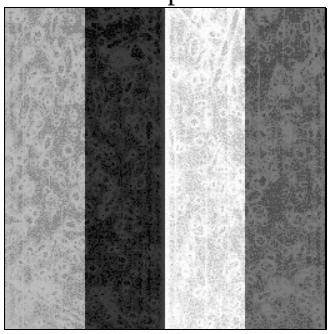
Chip 2



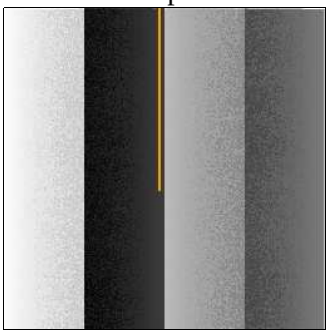
Chip 3



Chip 6



Chip 7



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	8.4.5	Processing system revision
caldbver	4.5.1.1	
date	2012-09-05T20:05:32	Date and time of file creation
revision	7	Processing version of data

sched_exp_time	7560.000000	[s] Scheduled observation exposure time
ontime	7506.589440763	Sum of GTIs [s]
ontime0	7506.5484007597	Sum of GTIs [s]
ontime1	7506.589440763	Sum of GTIs [s]
ontime2	7506.6304807663	Sum of GTIs [s]
ontime3	7506.6715207547	Sum of GTIs [s]
ontime6	7506.7536007613	Sum of GTIs [s]
ontime7	7506.712560758	Sum of GTIs [s]
l1events	335256	Number of level 1 events

2.1.4 Events

	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**	**ccd 7**
level 1 events	49589	69276	50878	51914	55177	58422
rejected events	43815	43903	45823	45800	49662	36554
rejected %	88%	63%	90%	88%	90%	62%

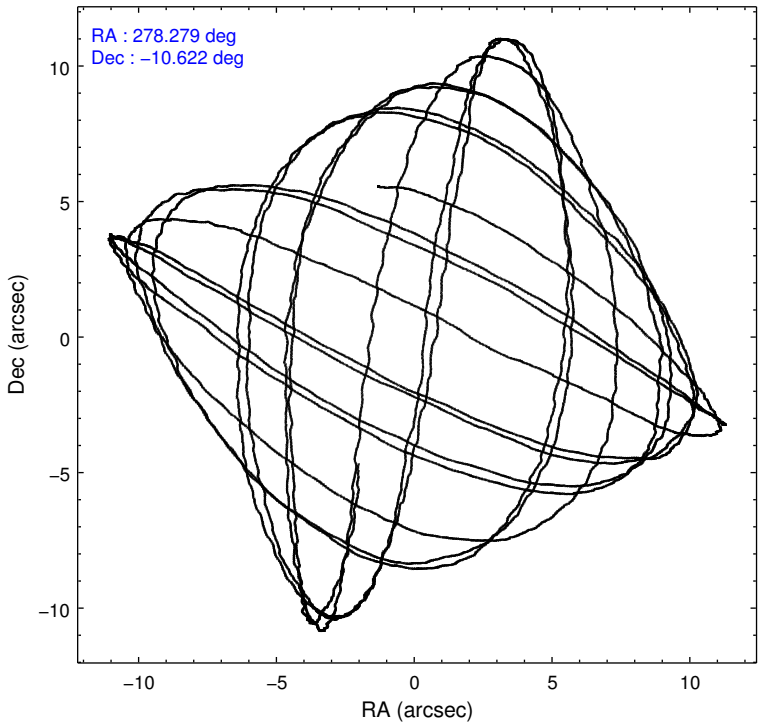
	ccd 0	**ccd 1**	**ccd 2**	**ccd 3**	**ccd 6**	**ccd 7**
grade 0 events	1544	15445	1168	1811	1093	1231
	3%	22%	2%	3%	1%	2%
grade 1 events	14	117	10	13	12	29
	0%	0%	0%	0%	0%	0%
grade 2 events	2166	4715	2011	2188	2178	4648
	4%	6%	3%	4%	3%	7%
grade 3 events	400	1358	319	355	335	1268
	0%	1%	0%	0%	0%	2%
grade 4 events	389	1290	321	373	337	1137
	0%	1%	0%	0%	0%	1%
grade 5 events	1106	1272	982	1118	1191	3514
	2%	1%	1%	2%	2%	6%
grade 6 events	1281	2594	1244	1389	1576	13606
	2%	3%	2%	2%	2%	23%
grade 7 events	42689	42485	44823	44667	48455	32989
	86%	61%	88%	86%	87%	56%

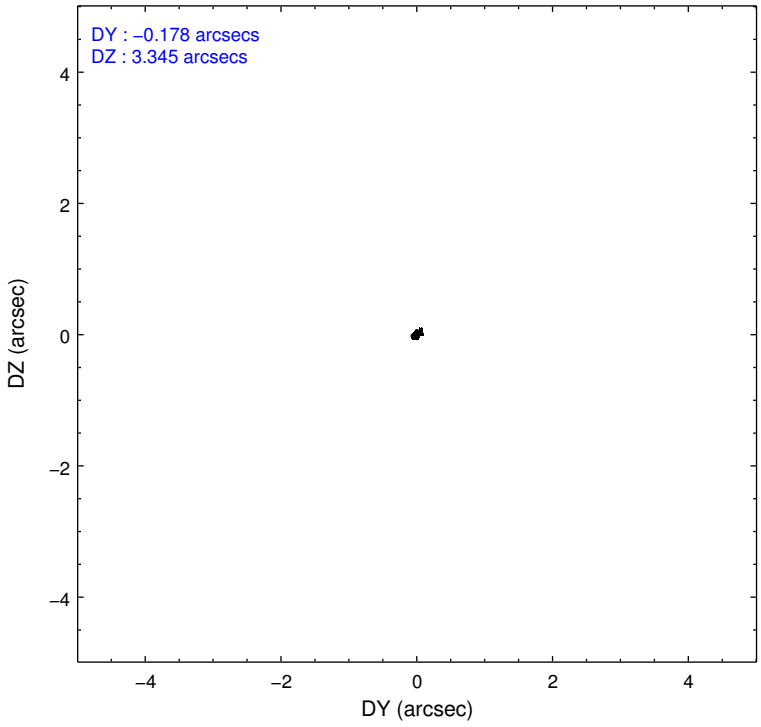
2.2 Compared Parameters

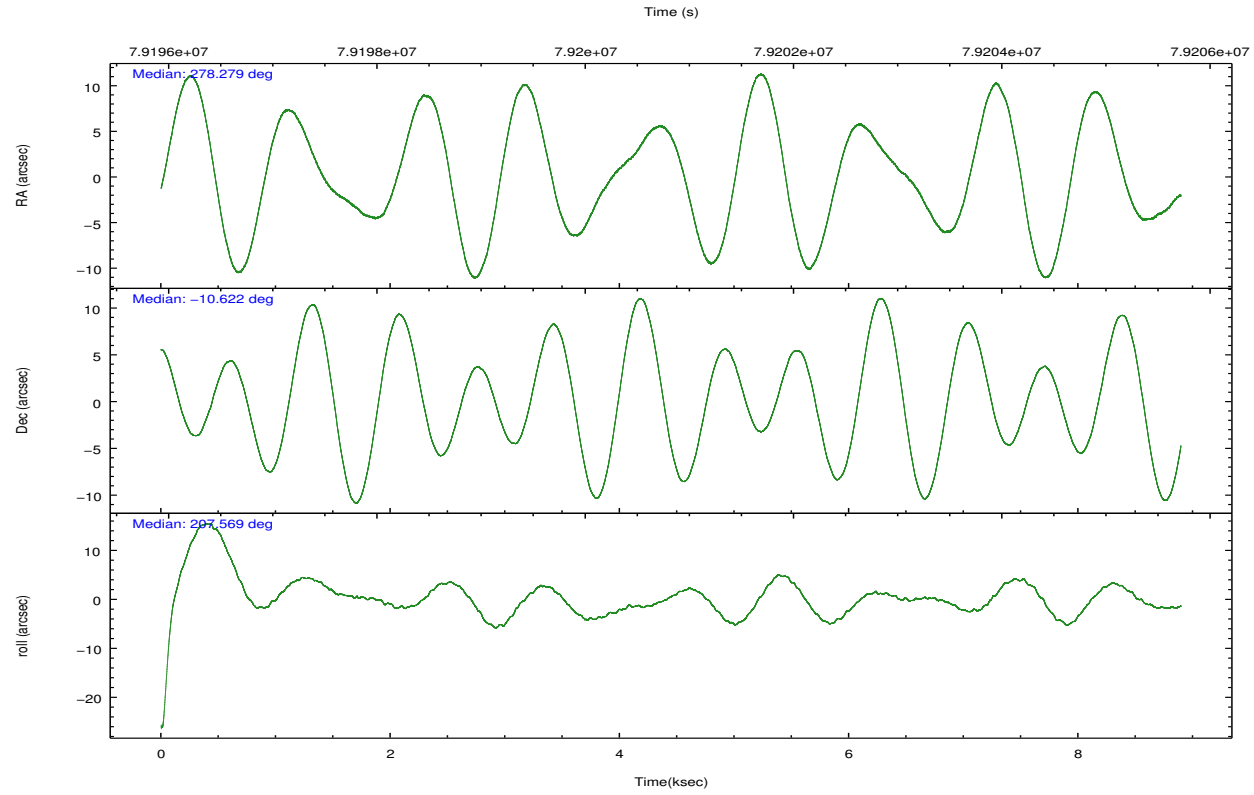
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-012367	ACIS-012367
Grating	NONE	NONE
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	278.294324	278.2792066450842
[deg] Pointing Dec	-10.599366	-10.62259837375553
[deg] Pointing Roll	207.363395	207.5693002905757
[mm] 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)	79197716.184000	79196181.816974
Observation start date	2000-07-05T15:20:52	2000-07-05T14:56:21
[s] Observation end time (MET)	79205276.184000	79205409.892314
Observation end date	2000-07-05T17:26:52	2000-07-05T17:30:09
Read mode	TIMED	TIMED

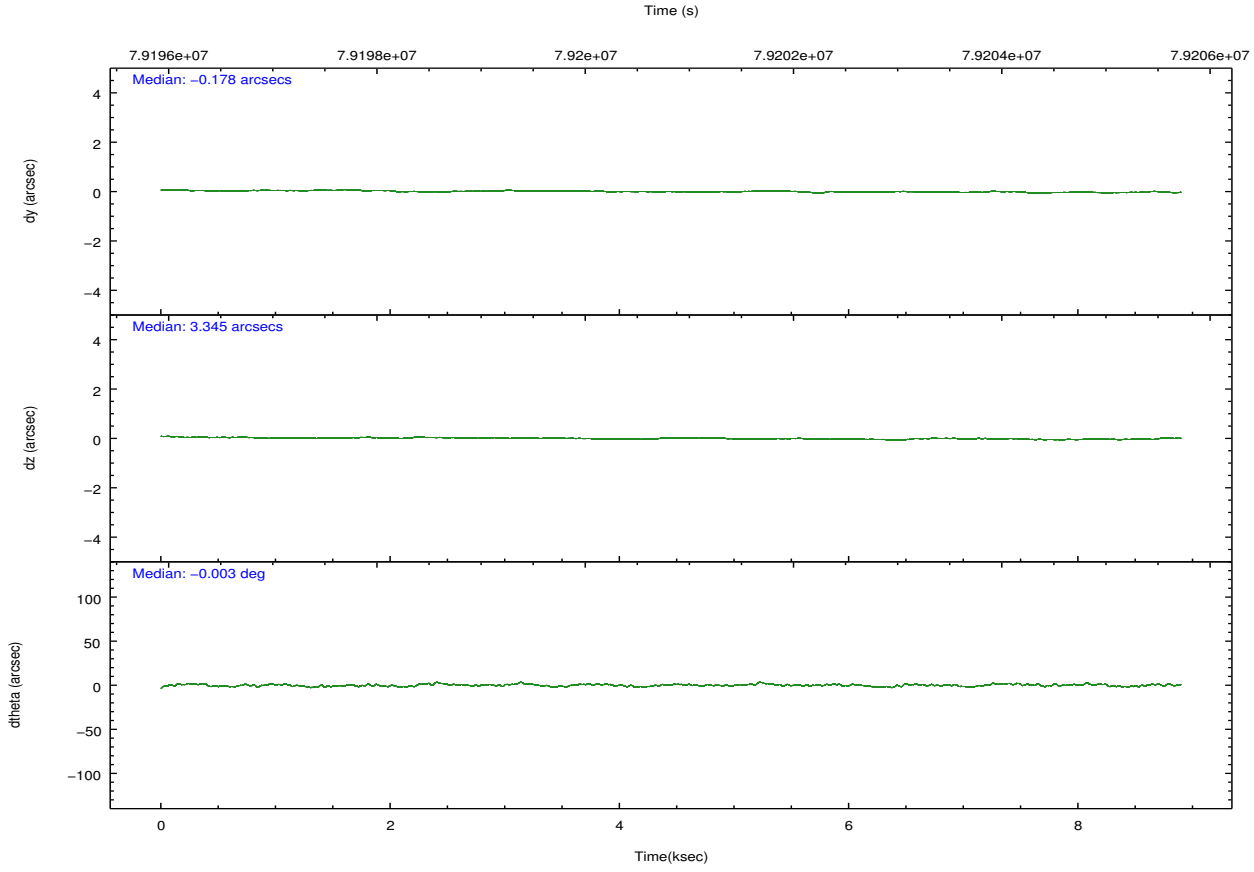
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

2.3 Aspect


RA : 278.279 deg
Dec : −10.622 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : −0.178 arcsecs
DZ : 3.345 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
7.9196e+07
7.9198e+07
7.92e+07
7.9202e+07
7.9204e+07
7.9206e+07
Median: 278.279 deg
RA (arcsec)
Median: −10.622 deg
Dec (arcsec)
Median: 297.569 deg
roll (arcsec)
Time(ksec)

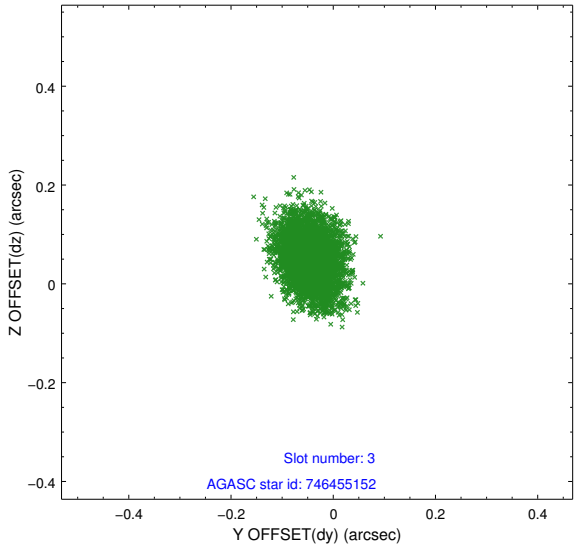

Time (s)
7.9196e+07
7.9198e+07
7.92e+07
7.9202e+07
7.9204e+07
7.9206e+07
Median: −0.178 arcsecs
dy (arcsec)
Median: 3.345 arcsecs
dz (arcsec)
Median: −0.003 deg
dtheta (arcsec)
Time(ksec)

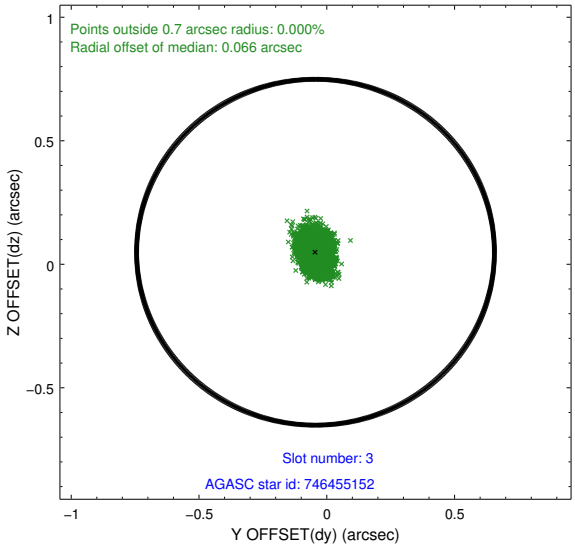
Slot Statistics

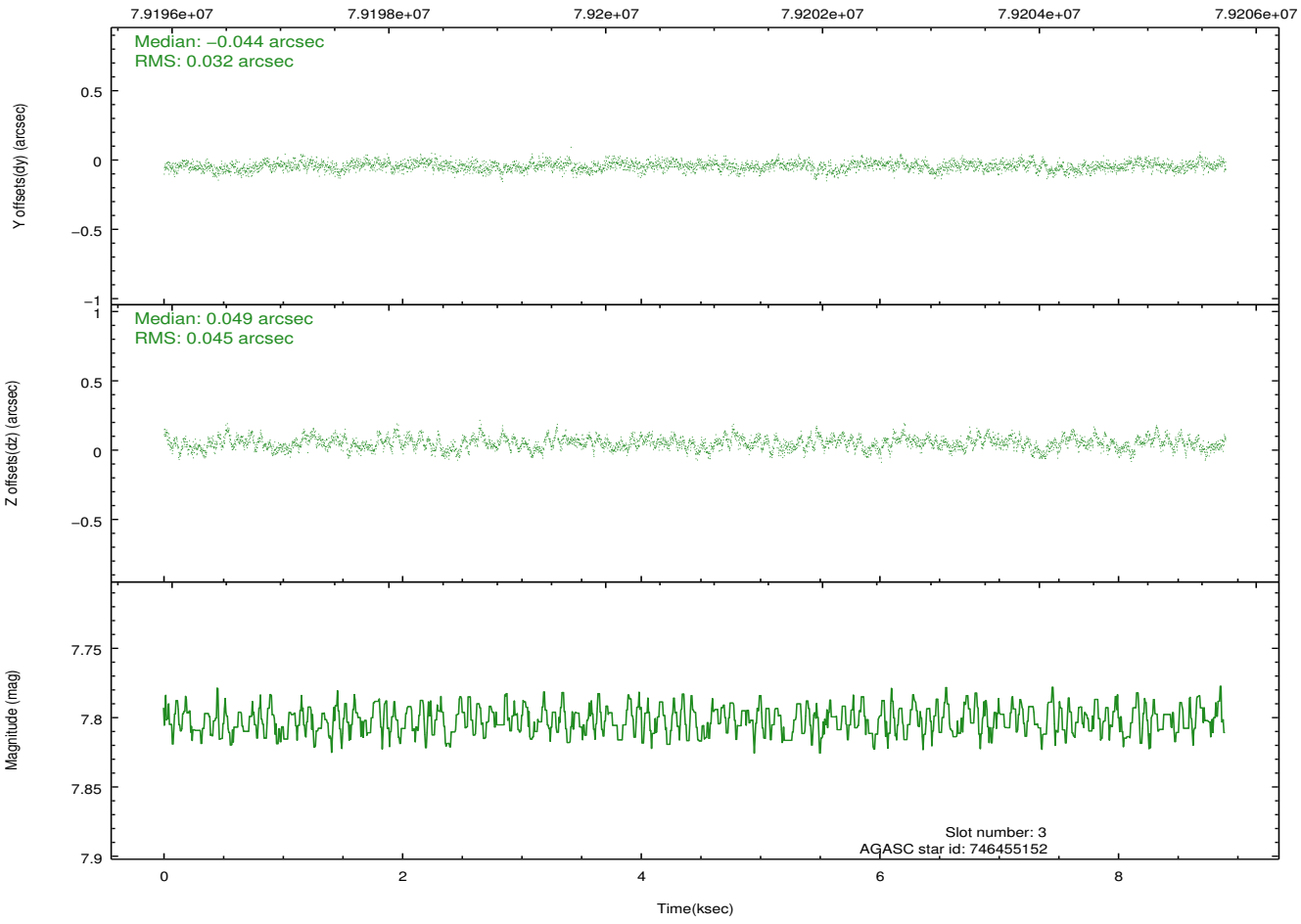
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-I-2	7.16	2170	-0.070	-0.081	0.011	0.019	0.000000	0.000000	-753.83	-737.45
1	FID	ACIS-I-4	7.19	2169	-0.018	0.066	0.010	0.015	0.000000	0.000000	2159.98	1168.70
2	FID	ACIS-I-5	7.23	2170	-0.014	0.084	0.011	0.017	0.000000	0.000000	-1807.10	1167.77
3	GUIDE	746455152	7.80	4341	-0.044	0.049	0.058	0.096	278.447893	-9.976732	-1513.76	-1739.93
4	GUIDE	746462456	8.39	4341	-0.114	-0.039	0.069	0.114	278.652171	-10.530173	-1239.35	361.55
5	GUIDE	746455112	8.92	4336	0.111	-0.003	0.092	0.150	278.266531	-10.703234	259.07	287.32
6	GUIDE	746460328	9.81	4271	0.048	-0.006	0.098	0.163	278.603974	-9.898096	-2135.26	-1736.60
7	OMITTED		0.00	0	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0.00

2.4 Star Slots

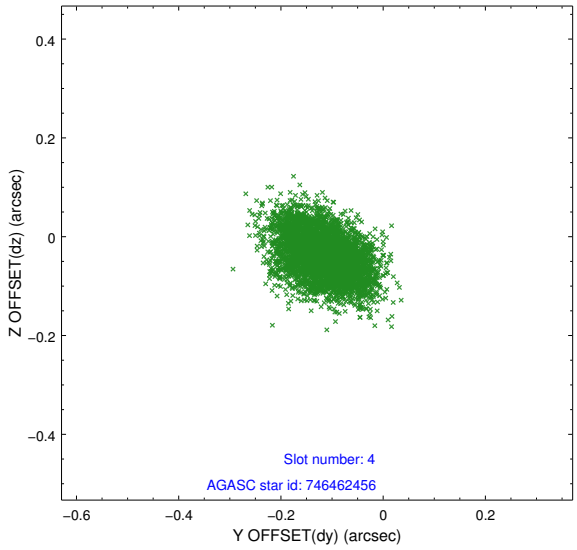
2.4.1 Slot 3

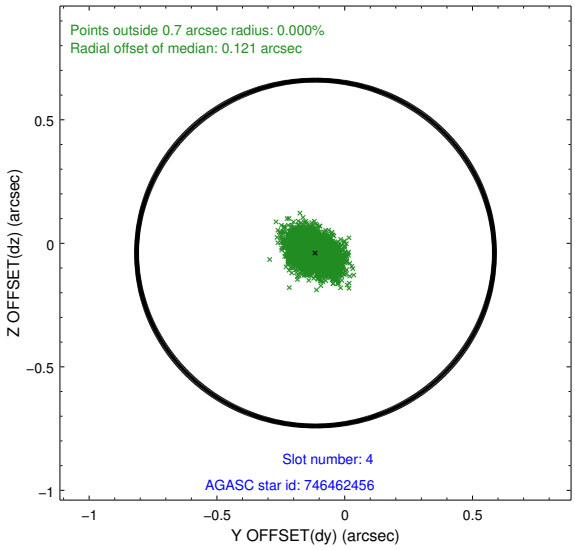


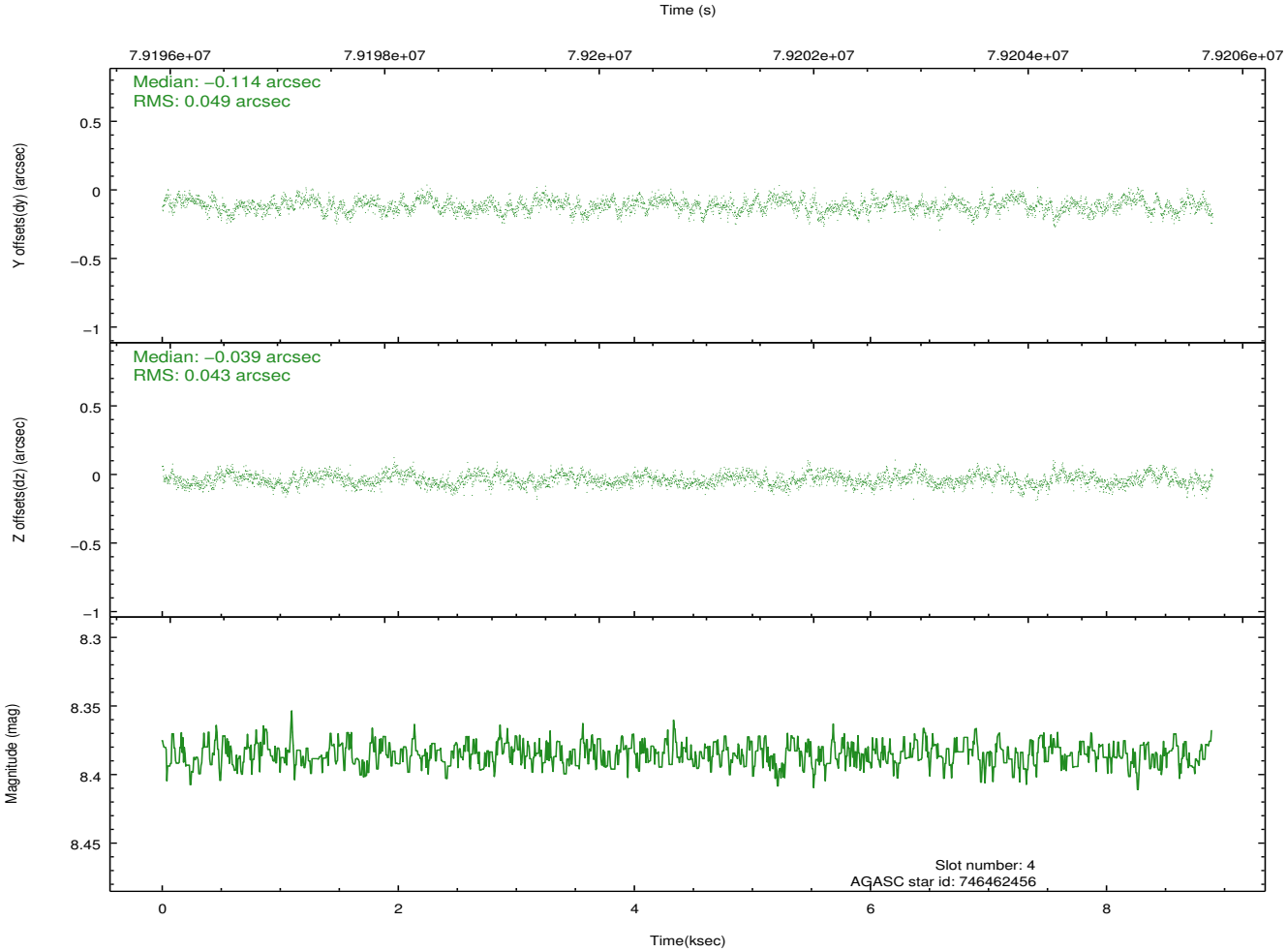




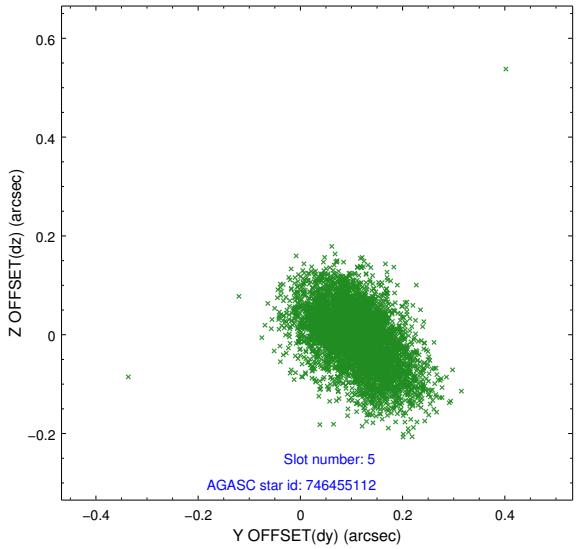
2.4.2 Slot 4

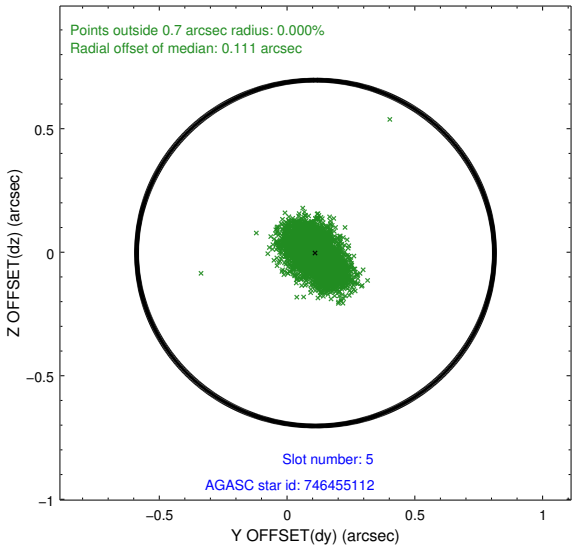

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 746462456

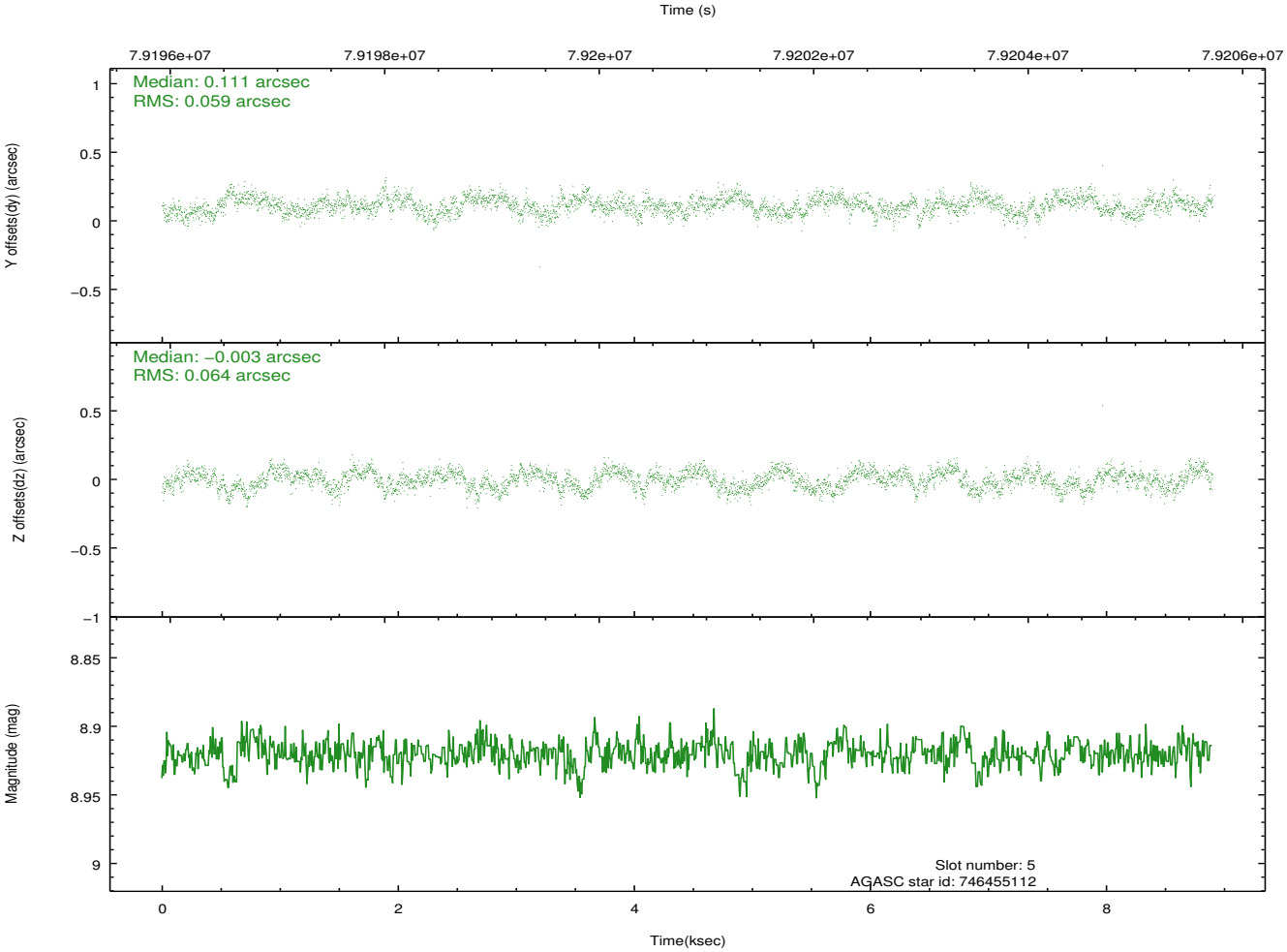

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.121 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 746462456


Time (s)
Median: –0.114 arcsec
RMS: 0.049 arcsec
Y offsets(dy) (arcsec)
Median: –0.039 arcsec
RMS: 0.043 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 746462456
Time(ksec)

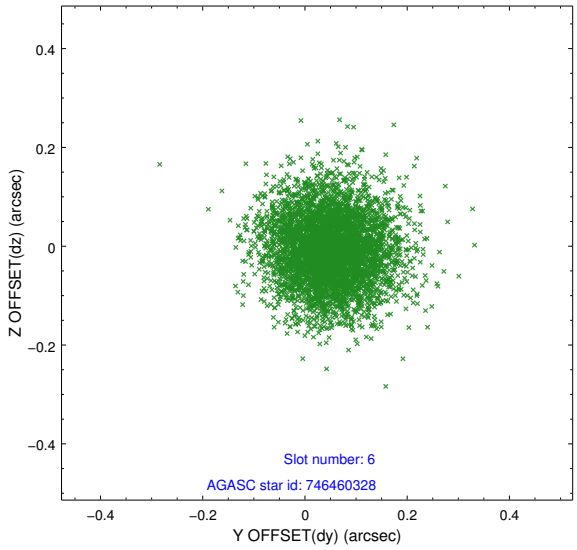
2.4.3 Slot 5

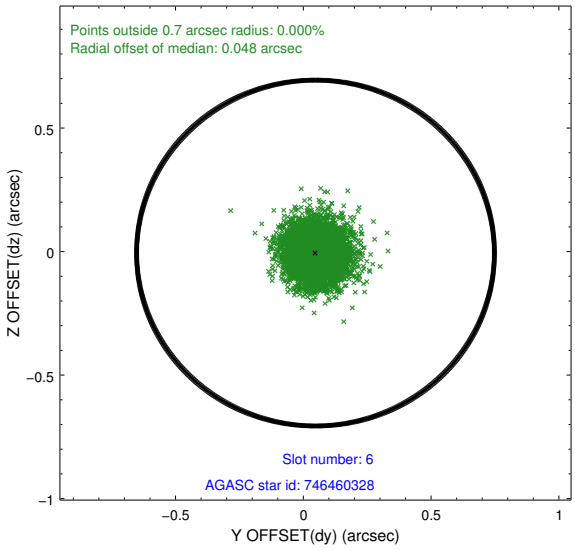

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 746455112

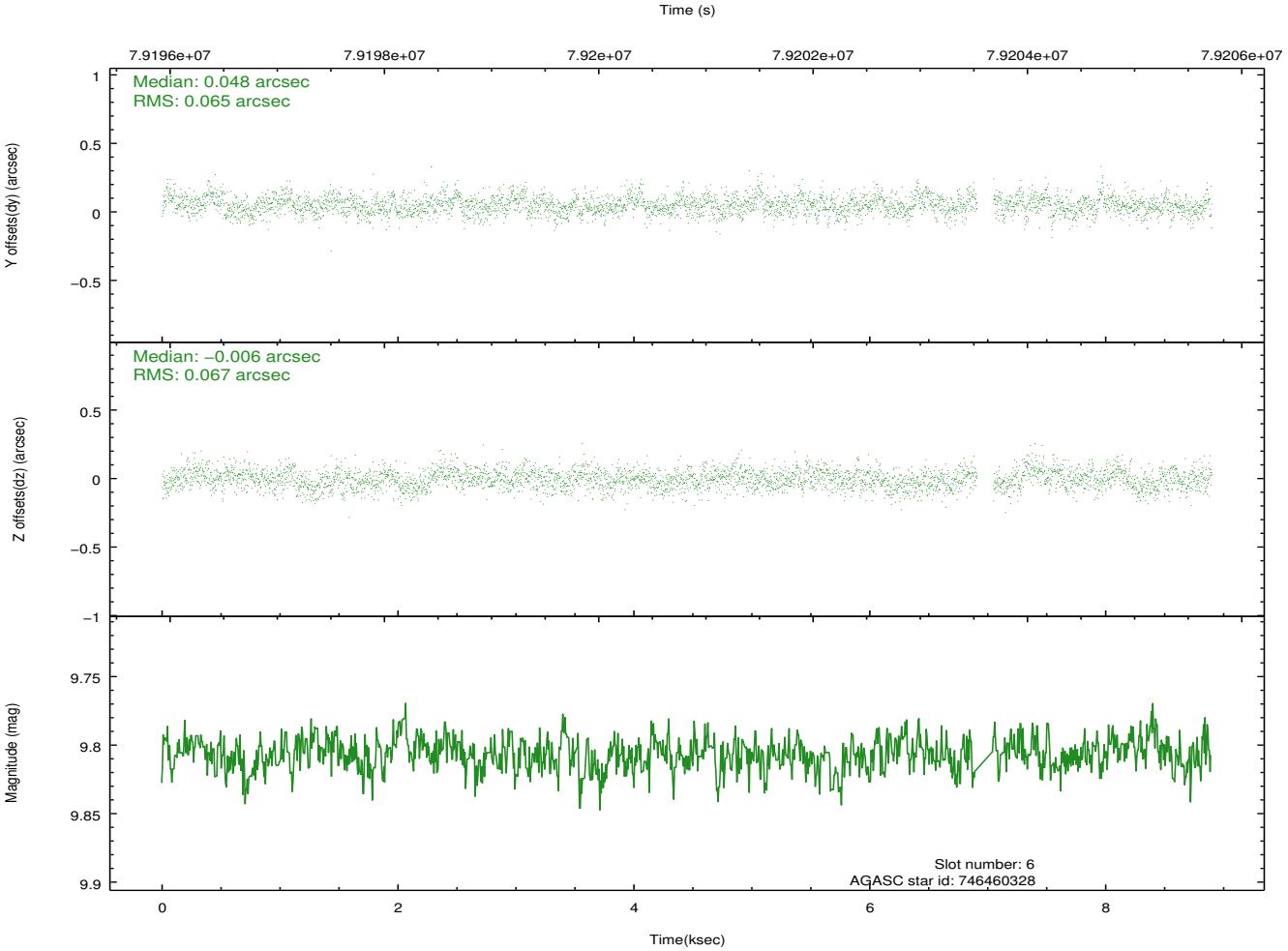

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.111 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 746455112


Time (s)
Median: 0.111 arcsec
RMS: 0.059 arcsec
Y offsets(dy) (arcsec)
Median: −0.003 arcsec
RMS: 0.064 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 746455112
Time(ksec)

2.4.4 Slot 6

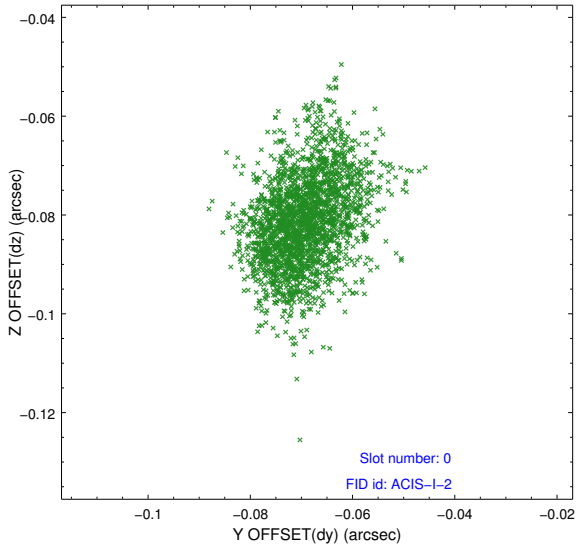

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 746460328

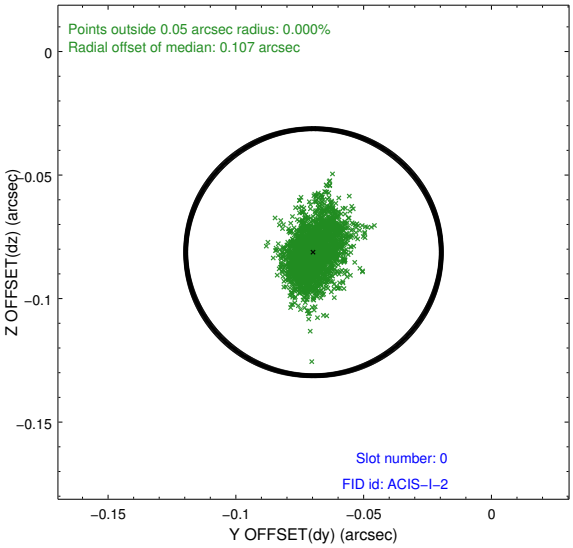

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.048 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 746460328

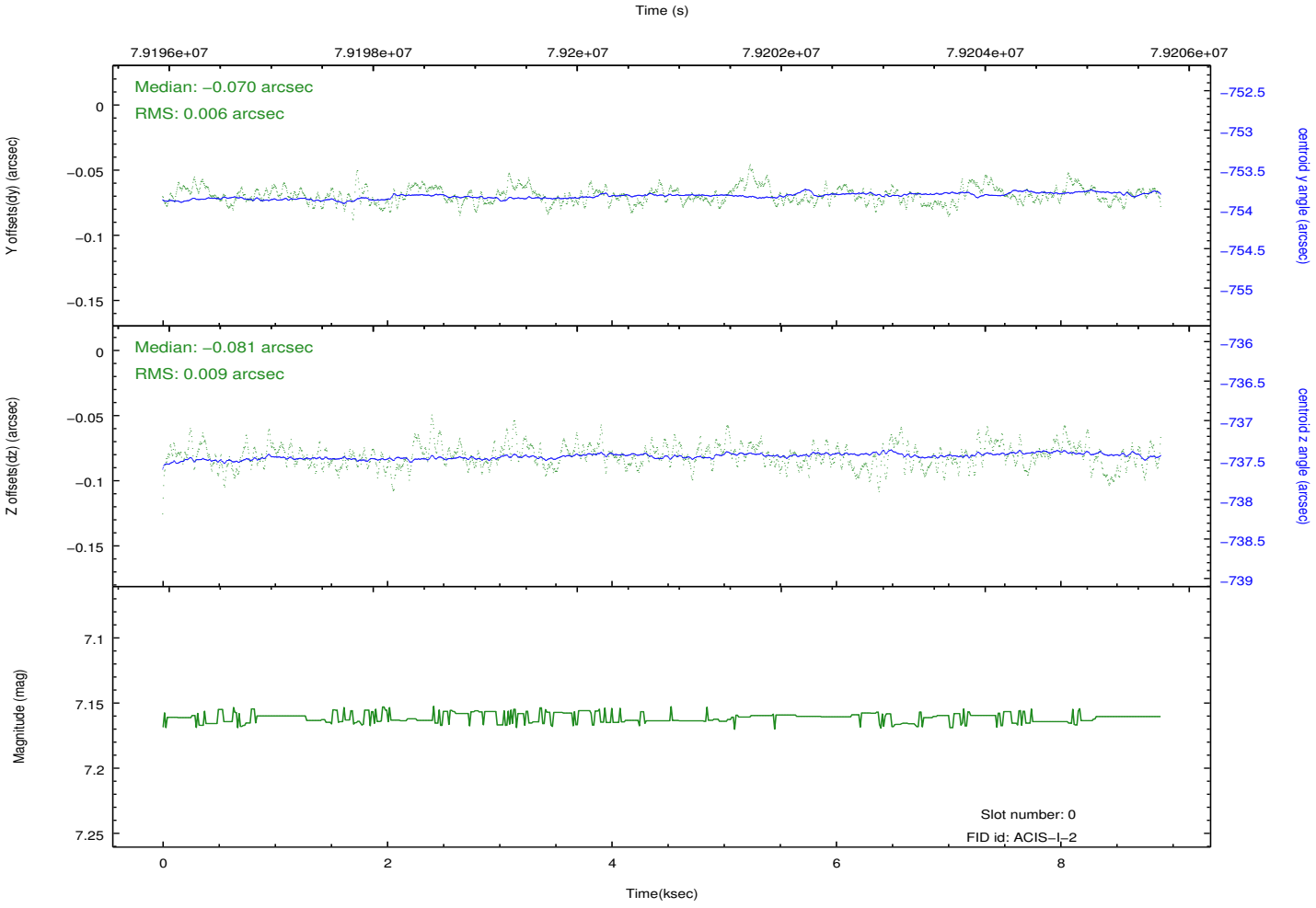

Time (s)
Median: 0.048 arcsec
RMS: 0.065 arcsec
Y offsets(dy) (arcsec)
Median: −0.006 arcsec
RMS: 0.067 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 746460328
Time(ksec)

2.5 FID Slots

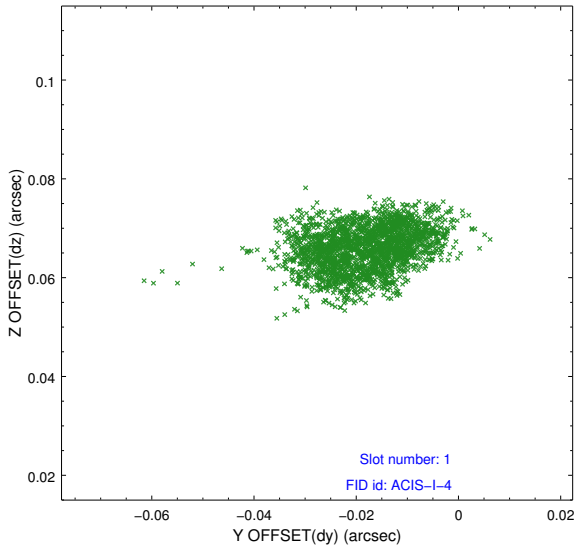
2.5.1 Slot 0

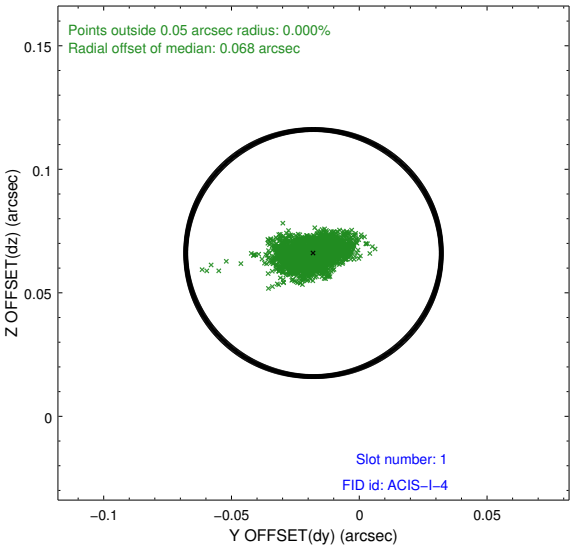


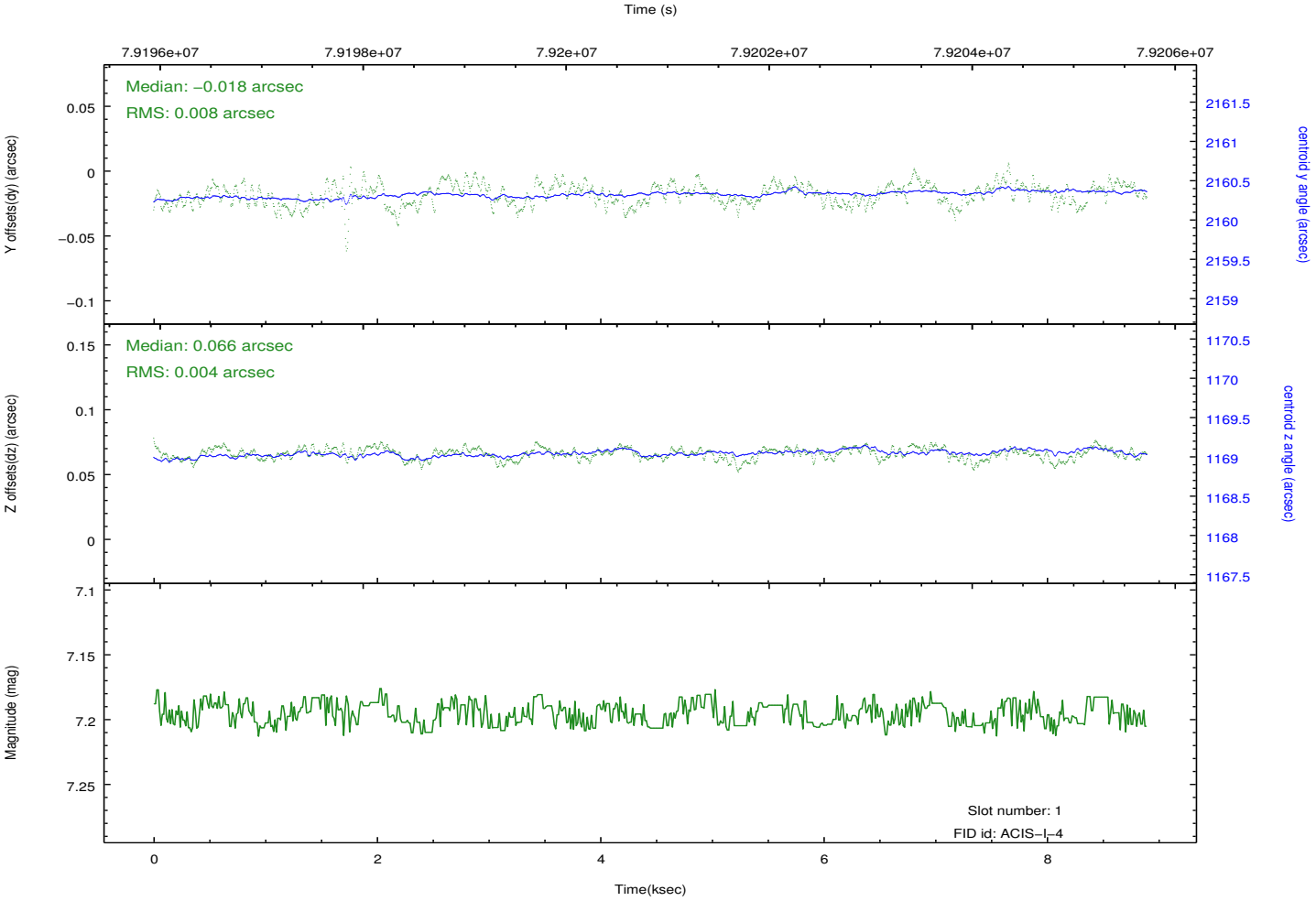




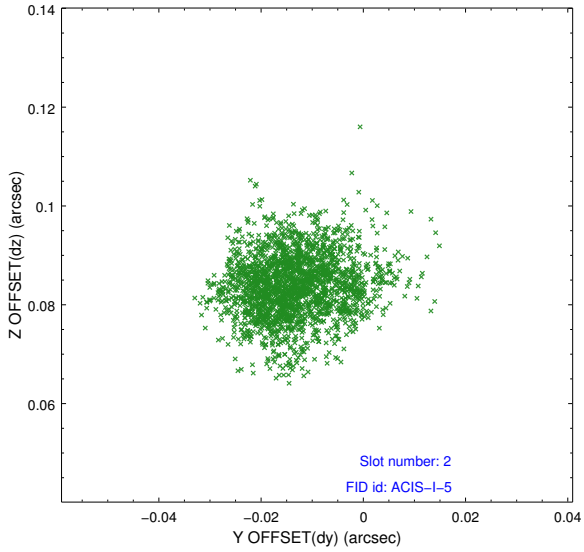
2.5.2 Slot 1

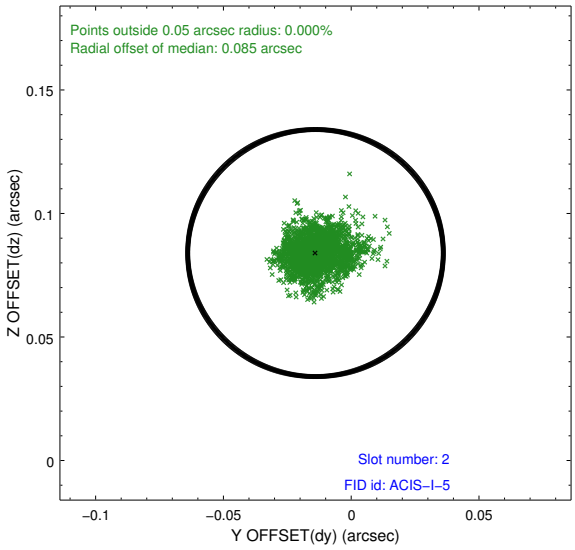

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−I−4

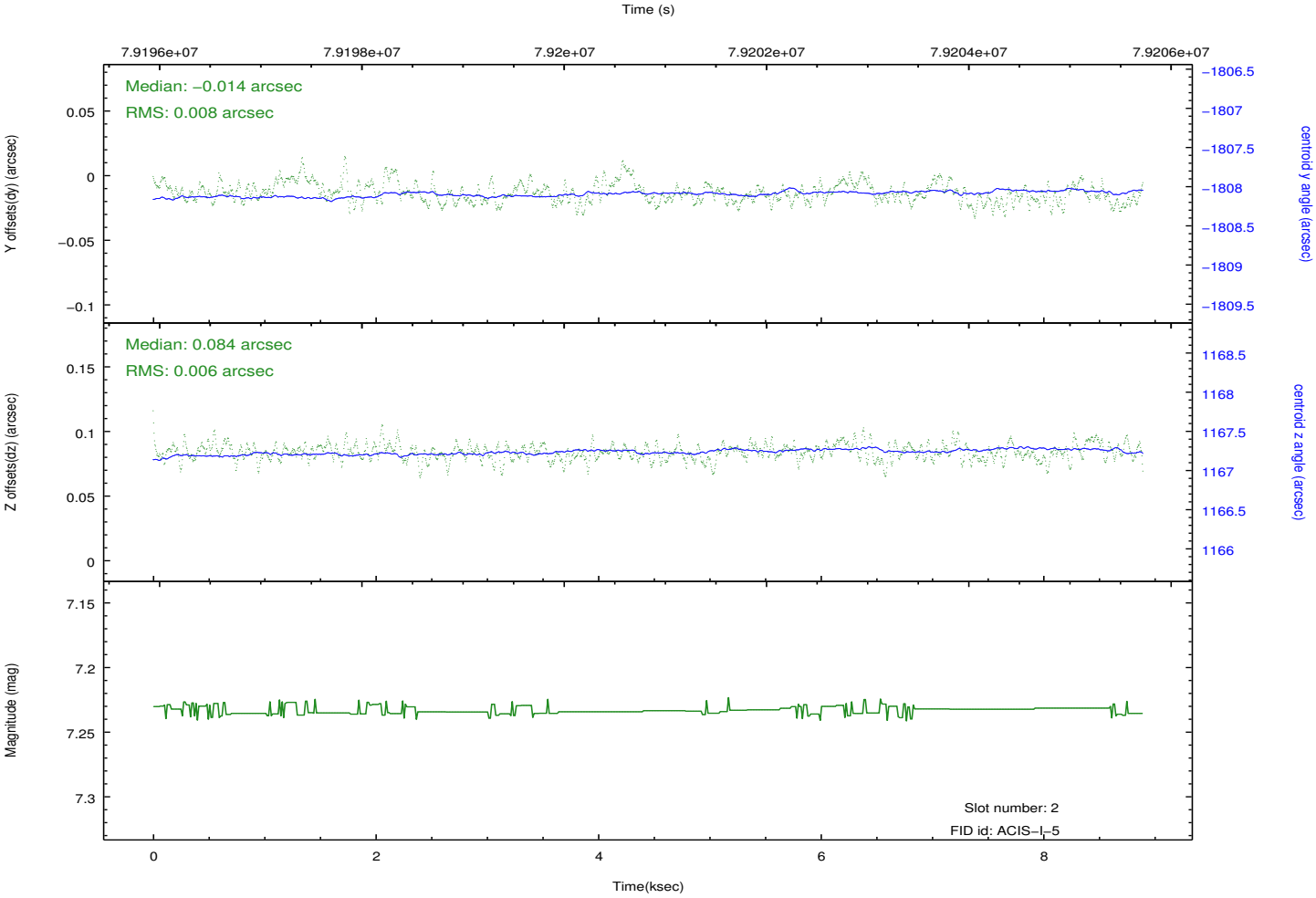

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.068 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−I−4


Time (s)
Median: −0.018 arcsec
RMS: 0.008 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.066 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 1
FID id: ACIS−I−4
Time(ksec)

2.5.3 Slot 2


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


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.085 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−I−5


Time (s)
Median: −0.014 arcsec
RMS: 0.008 arcsec
Y offsets(dy) (arcsec)
Median: 0.084 arcsec
RMS: 0.006 arcsec
Z offsets(dz) (arcsec)
centroid y angle (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−I−5
Time(ksec)

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	7.507

A.2 Comments

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The guide star in slot 7 was removed from the aspect solution due to
poor data quality. The aspect solution is improved by the removal of
this guide star from the solution.
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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.
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