V&V Reference Report
L2 ASCDS Version : 8.5.1.1

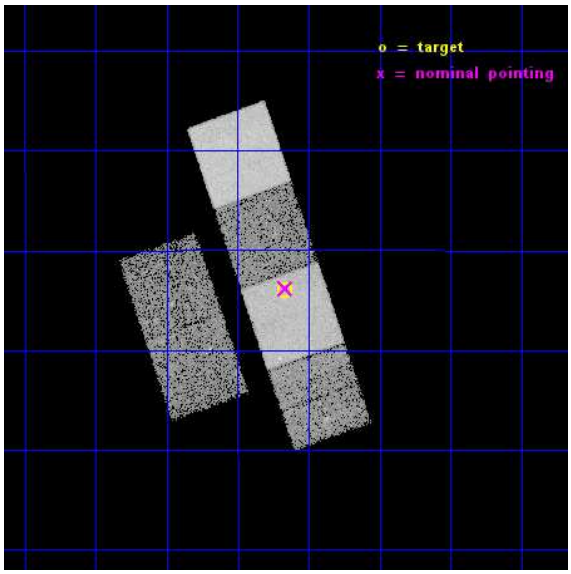
Observation 15057 - L2 Version 3
Chandra X-Ray Center

L2 Processing Date : Dec 1 2014

Contents

1 Front

seq_num	702864	Sequence number
obs_id	15057	Observation id
title	C-GOALS: The Chandra-RBGS Survey of a Complete Sample of Major-Merger LIRGs	Proposal title
observer	Professor David Sanders	Principal investigator
object	IRAS F16164-0746	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	244.792917	Observer's specified target RA [deg]
dec_targ	-7.899167	Observer's specified target Dec [deg]
ra_nom	244.79104631375	Nominal RA [deg]
dec_nom	-7.8968146081376	Nominal Dec [deg]
roll_nom	70.852961678695	Nominal Roll [deg]
revision	3	Processing version of data
ontime	14968.919402361	Sum of GTIs [s]
livetime	14779.373931687	Livetime [s]
ontime2	14965.71947211	Sum of GTIs [s]
ontime3	14968.796282351	Sum of GTIs [s]
ontime5	14968.878362358	Sum of GTIs [s]
ontime6	14968.837322354	Sum of GTIs [s]
ontime7	14968.919402361	Sum of GTIs [s]
ontime8	14968.755242348	Sum of GTIs [s]
l2events	144433	Number of level 2 events

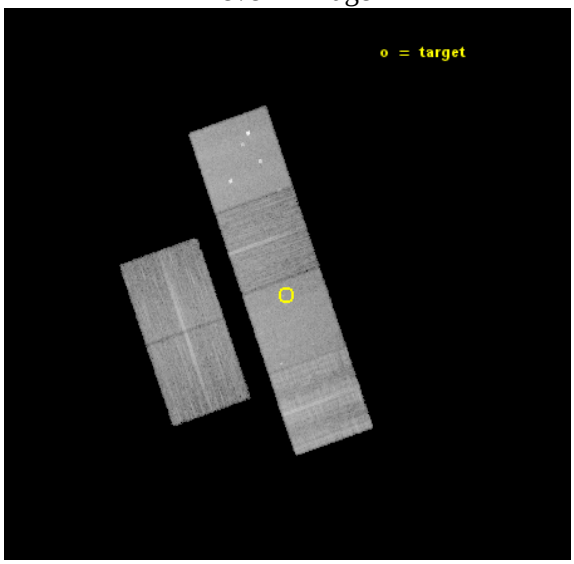


2 OBI

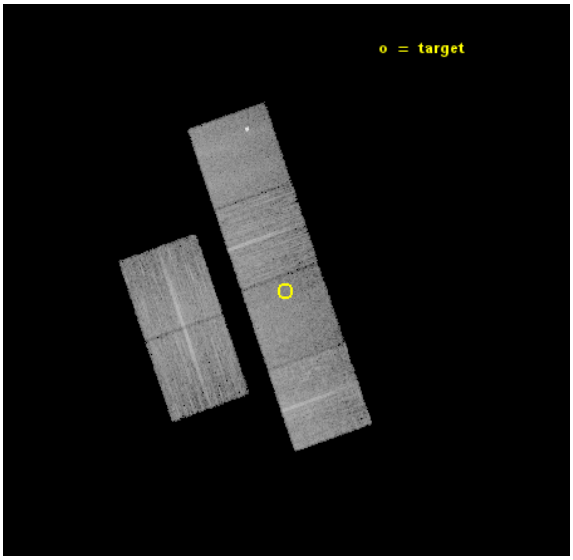
2.1 OBI

2.1.1 Images

Level 1 Image

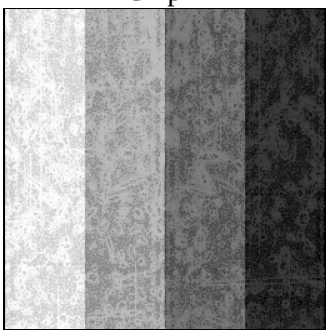


Level 1 Bad Events

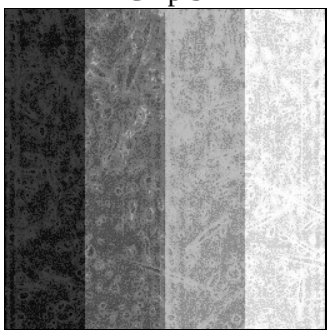


2.1.2 Bias

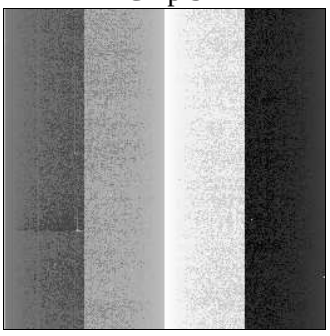
Chip 2



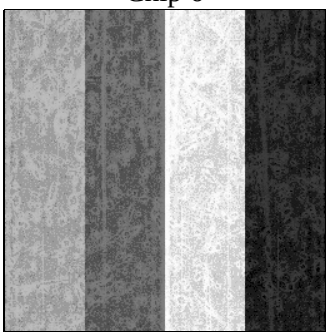
Chip 3



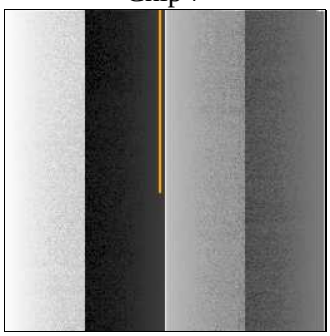
Chip 5



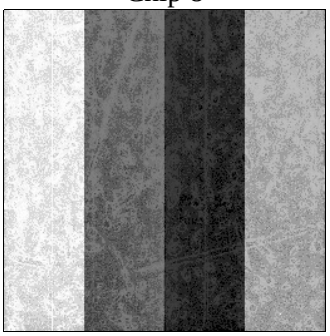
Chip 6



Chip 7



Chip 8



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.3	Processing system revision
caldbver	4.6.4	
date	2014-12-01T03:24:14	Date and time of file creation
revision	3	Processing version of data

sched_exp_time	15000.000000	[s] Scheduled observation exposure time
ontime	14968.919402361	Sum of GTIs [s]
ontime2	14965.71947211	Sum of GTIs [s]
ontime3	14968.796282351	Sum of GTIs [s]
ontime5	14968.878362358	Sum of GTIs [s]
ontime6	14968.837322354	Sum of GTIs [s]
ontime7	14968.919402361	Sum of GTIs [s]
ontime8	14968.755242348	Sum of GTIs [s]
l1events	612963	Number of level 1 events

2.1.4 Events

	ccd 2	ccd 3	ccd 5	ccd 6	ccd 7	ccd 8
level 1 events	83918	76812	138543	82598	108246	122846
rejected events	74120	67706	70475	72138	59628	80108
rejected %	88%	88%	50%	87%	55%	65%

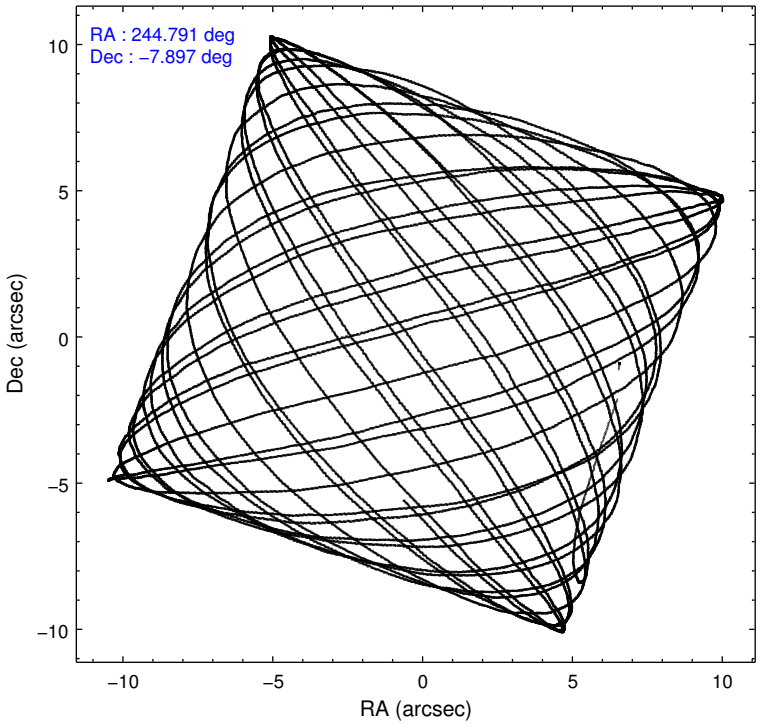
	ccd 2	ccd 3	ccd 5	ccd 6	ccd 7	ccd 8
grade 0 events	3789	3334	8273	4021	4470	15127
	4%	4%	5%	4%	4%	12%
grade 1 events	43	41	283	53	138	117
	0%	0%	0%	0%	0%	0%
grade 2 events	2355	1996	20986	2287	10253	7549
	2%	2%	15%	2%	9%	6%
grade 3 events	906	938	2390	987	4188	5938
	1%	1%	1%	1%	3%	4%
grade 4 events	940	964	2271	1011	4169	5535
	1%	1%	1%	1%	3%	4%
grade 5 events	3478	4015	10085	3961	11247	5876
	4%	5%	7%	4%	10%	4%
grade 6 events	1808	1875	34160	2157	25548	8596
	2%	2%	24%	2%	23%	6%
grade 7 events	70599	63649	60095	68121	48233	74108
	84%	82%	43%	82%	44%	60%

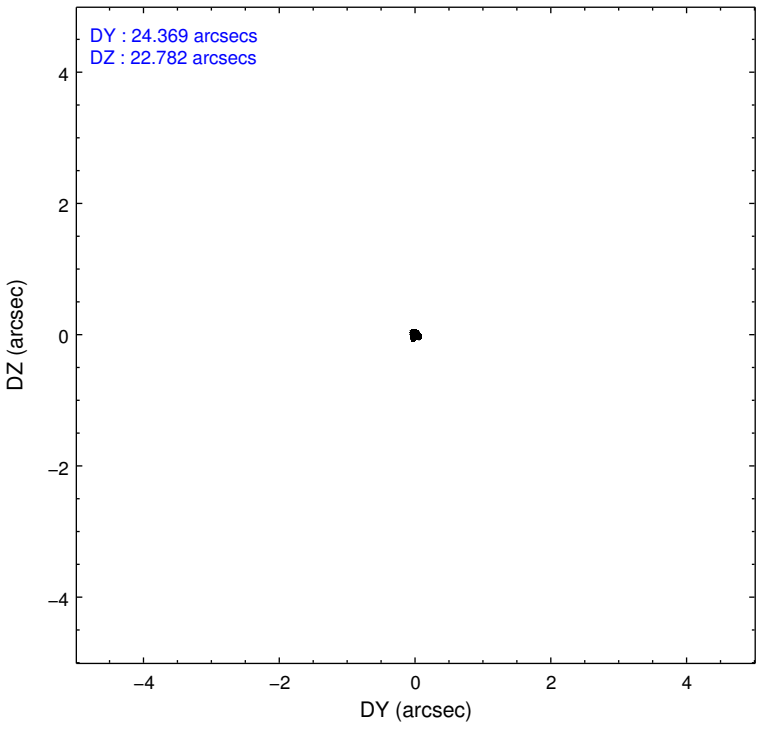
2.2 Compared Parameters

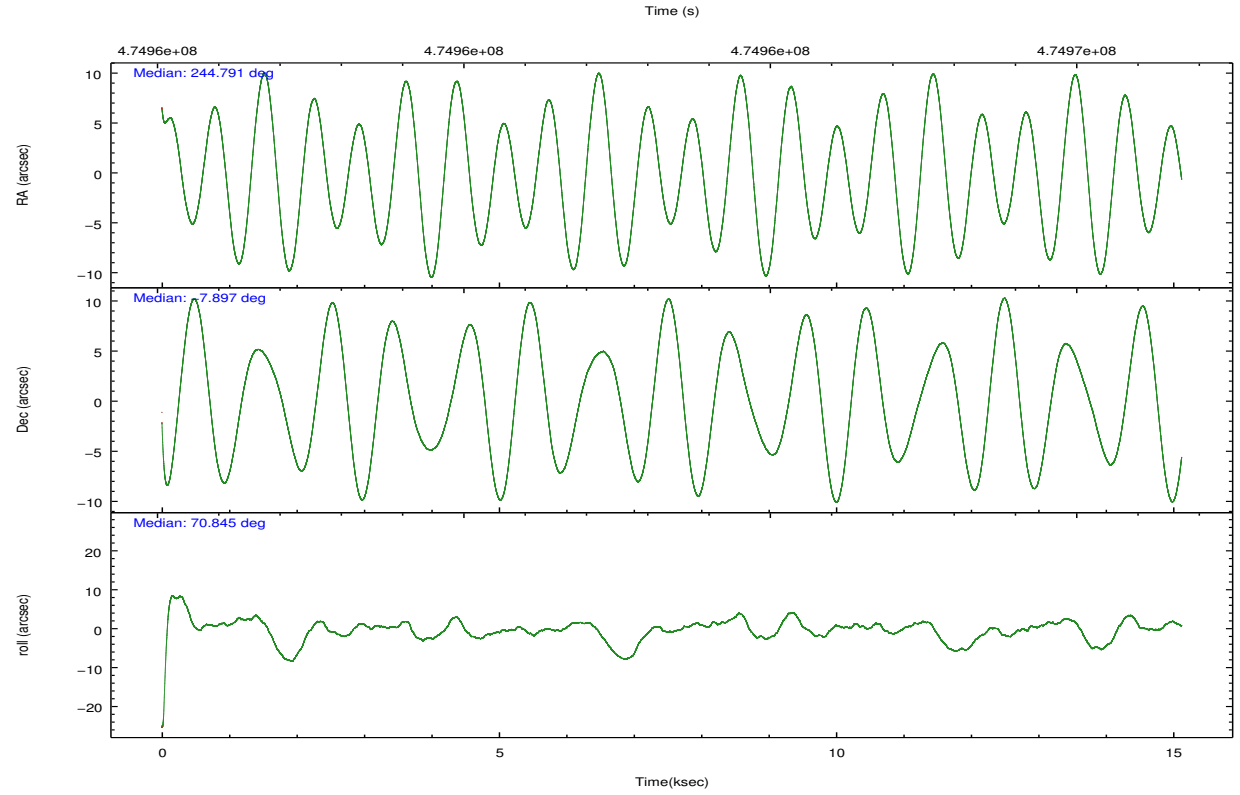
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-235678	ACIS-235678
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	244.796588	244.7910463137522
[deg] Pointing Dec	-7.923569	-7.896814608137569
[deg] Pointing Roll	70.697135	70.8529616786948
[mm] 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)	474955958.184000	474954555.77582
Observation start date	2013-01-19T04:11:31	2013-01-19T03:49:15
[s] Observation end time (MET)	474970958.184000	474971962.83926
Observation end date	2013-01-19T08:21:31	2013-01-19T08:39:22
Read mode	TIMED	TIMED

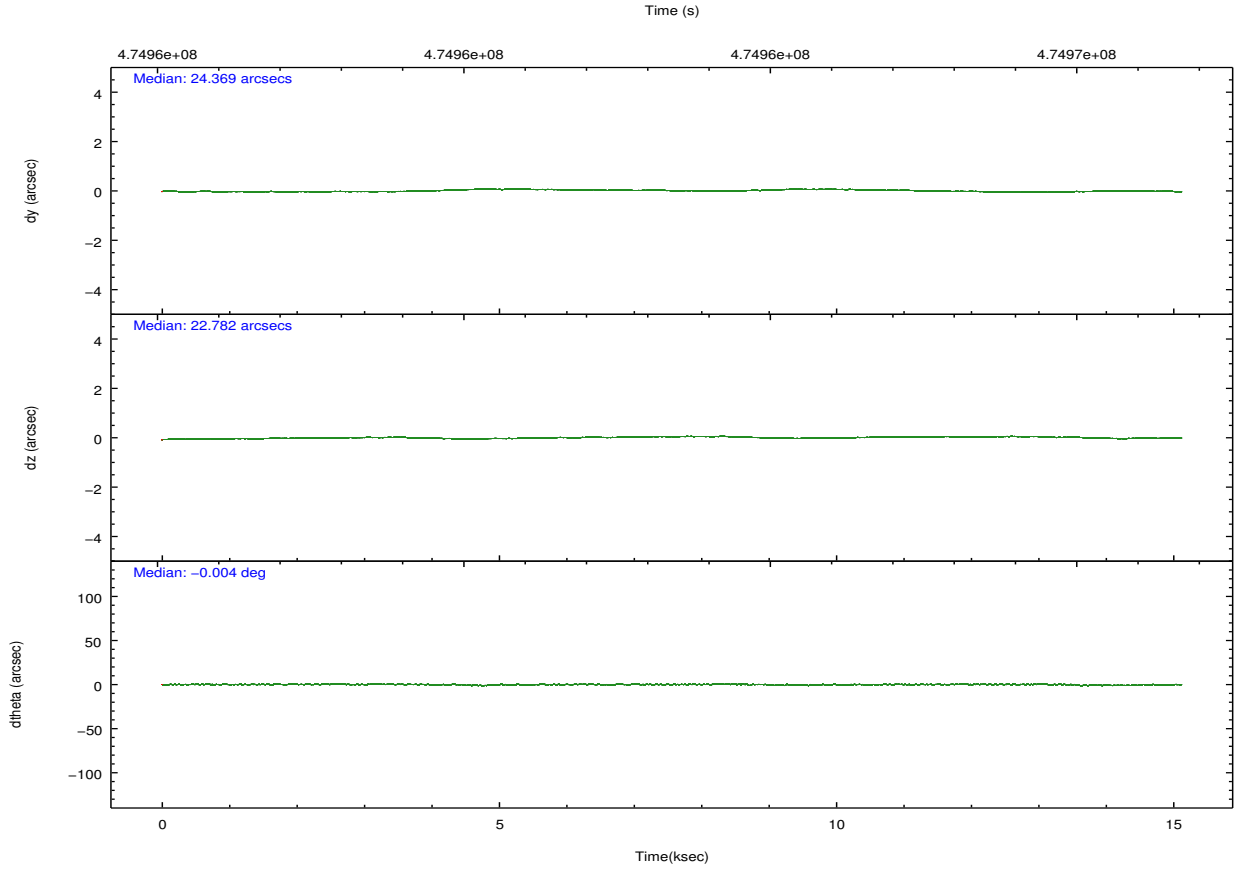
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	O2	Y
CCD I3 on	Y	Y
CCD S0 on	N	N
CCD S1 on	O1	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	N	N
Number of optional ACIS chips dropped	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 : 244.791 deg
Dec : −7.897 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : 24.369 arcsecs
DZ : 22.782 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
4.7496e+08
4.7496e+08
4.7496e+08
4.7497e+08
Median: 244.791 deg
RA (arcsec)
Median: −7.897 deg
Dec (arcsec)
Median: 70.845 deg
roll (arcsec)
Time(ksec)

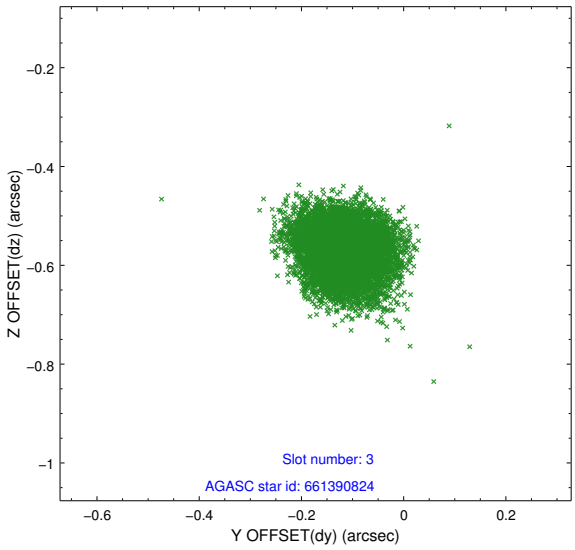

Time (s)
4.7496e+08
4.7496e+08
4.7496e+08
4.7497e+08
Median: 24.369 arcsecs
dy (arcsec)
Median: 22.782 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

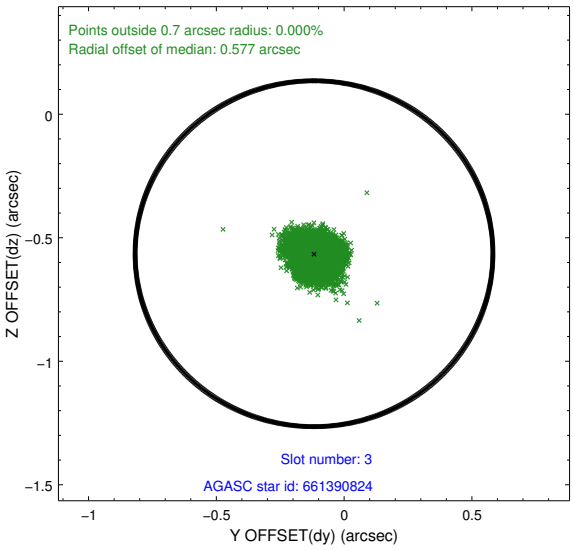
Slot Statistics

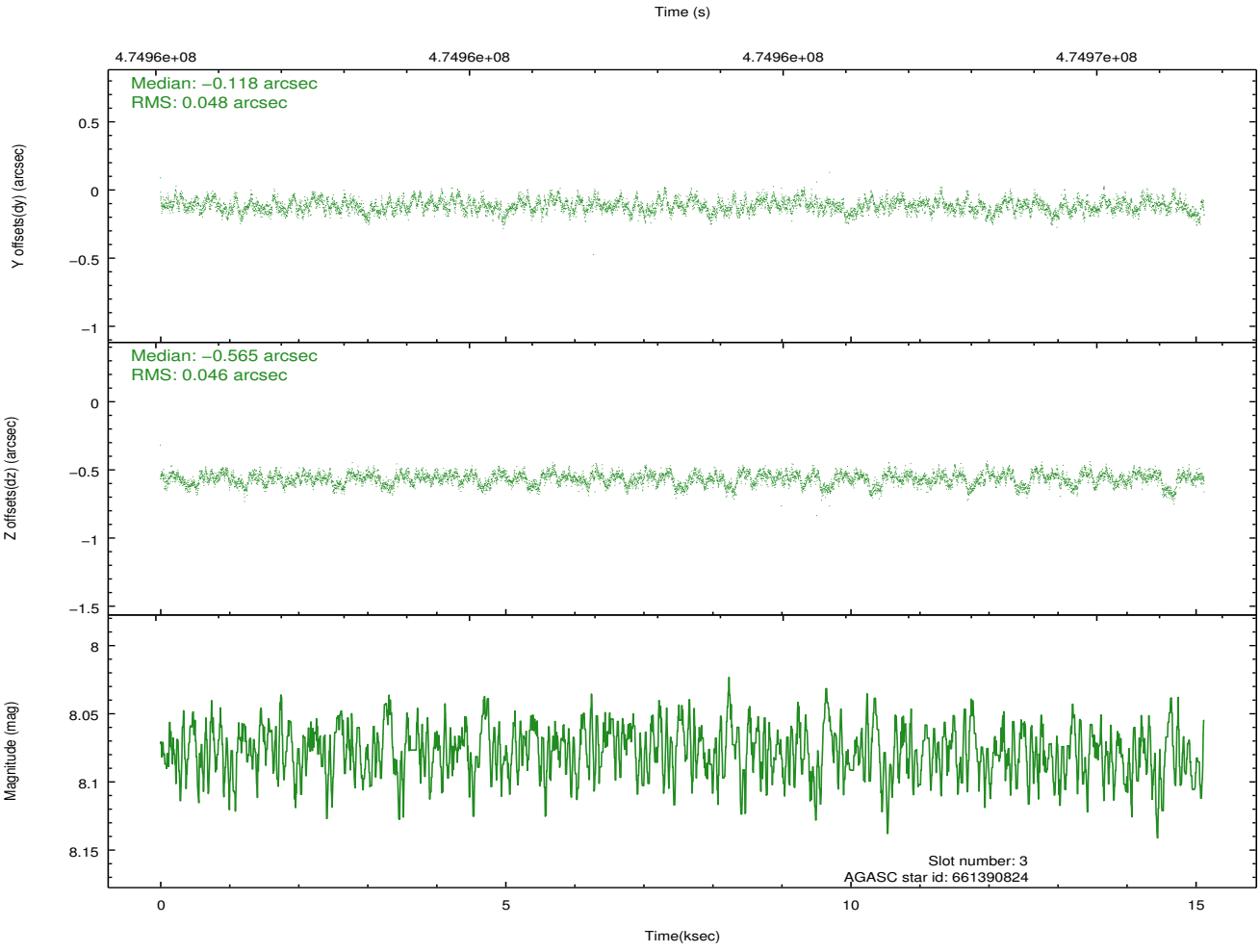
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-1	7.01	3689	0.016	0.014	0.007	0.011	0.000000	0.000000	918.41	-1739.96
1	FID		ACIS-S-4	7.01	3689	0.210	-0.013	0.006	0.010	0.000000	0.000000	2136.21	163.84
2	FID		ACIS-S-5	7.05	3689	-0.253	0.012	0.006	0.011	0.000000	0.000000	-1830.31	157.87
3	GUIDE	used	661390824	8.08	7377	-0.118	-0.565	0.070	0.113	244.775321	-7.319376	2027.92	790.58
4	GUIDE	used	735716872	7.86	7377	0.034	-0.204	0.076	0.131	244.774798	-7.877865	130.12	127.89
5	GUIDE	used	737416552	9.43	7337	-0.327	0.793	0.145	0.228	245.549324	-7.629539	1885.05	-2184.60
6	GUIDE	used	735714064	8.49	7376	0.004	-0.441	0.074	0.116	244.495218	-7.681533	467.08	1302.16
7	GUIDE	used	737420432	10.03	7363	0.407	0.427	0.207	0.313	245.165339	-8.095544	-149.36	-1444.73

2.4 Star Slots

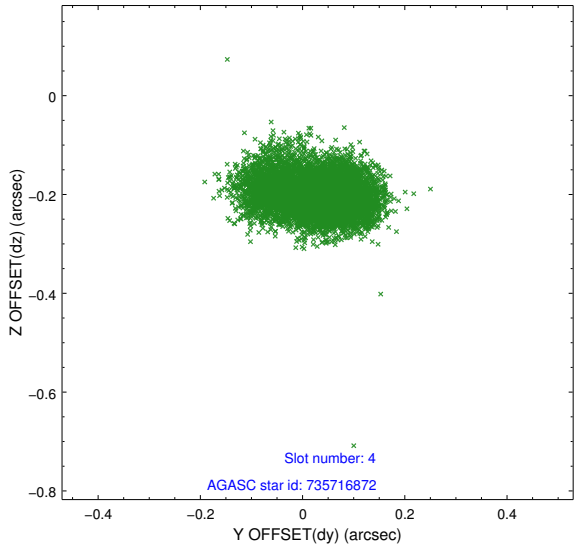
2.4.1 Slot 3

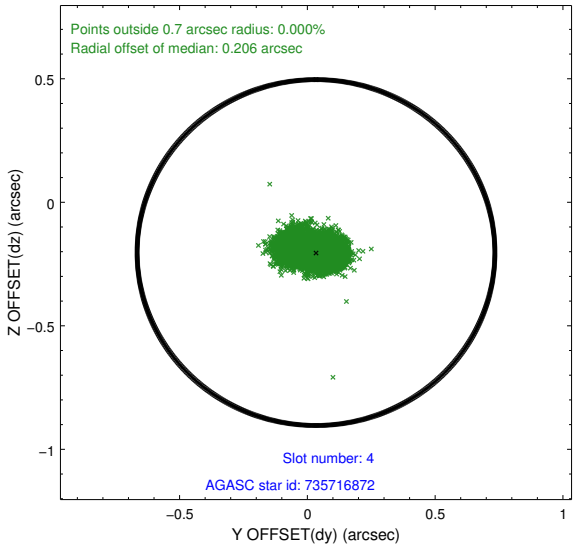


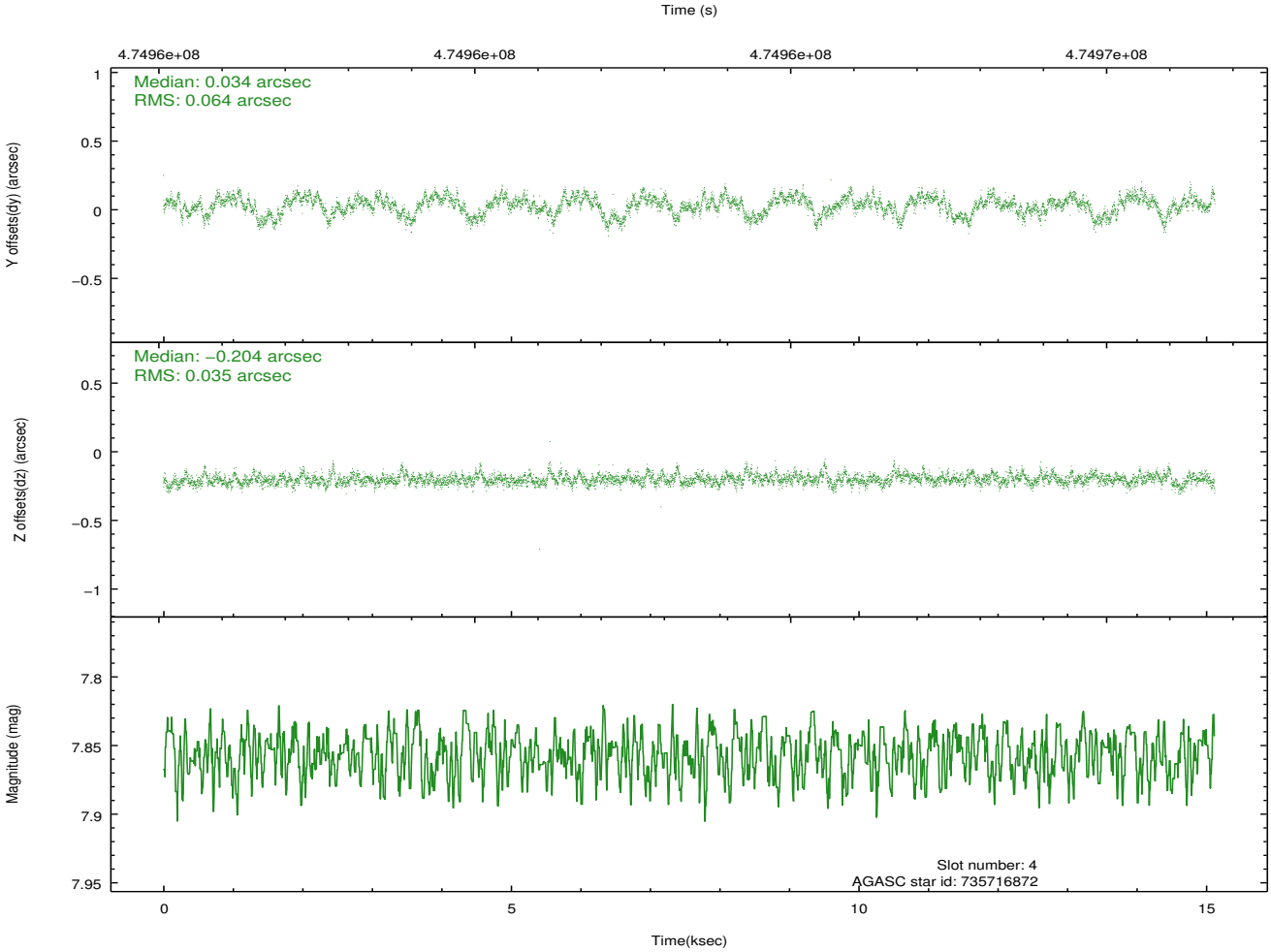




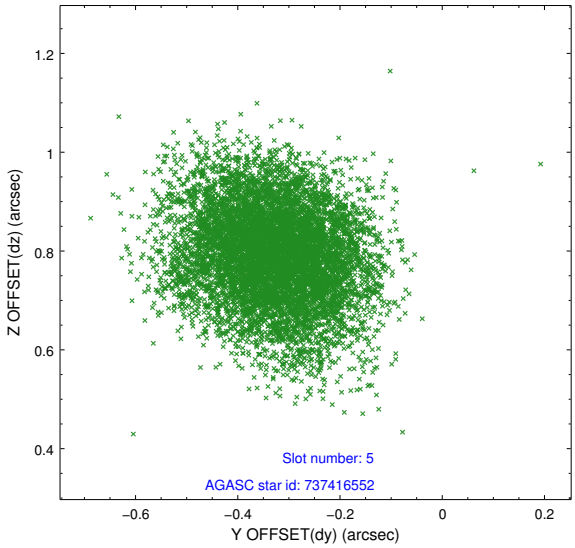
2.4.2 Slot 4

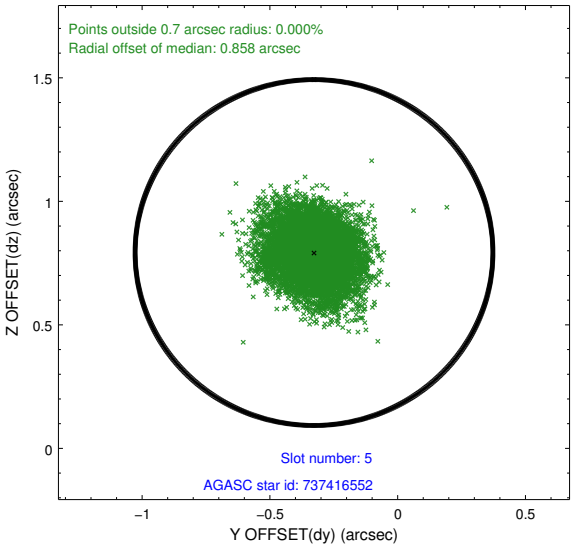

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 735716872

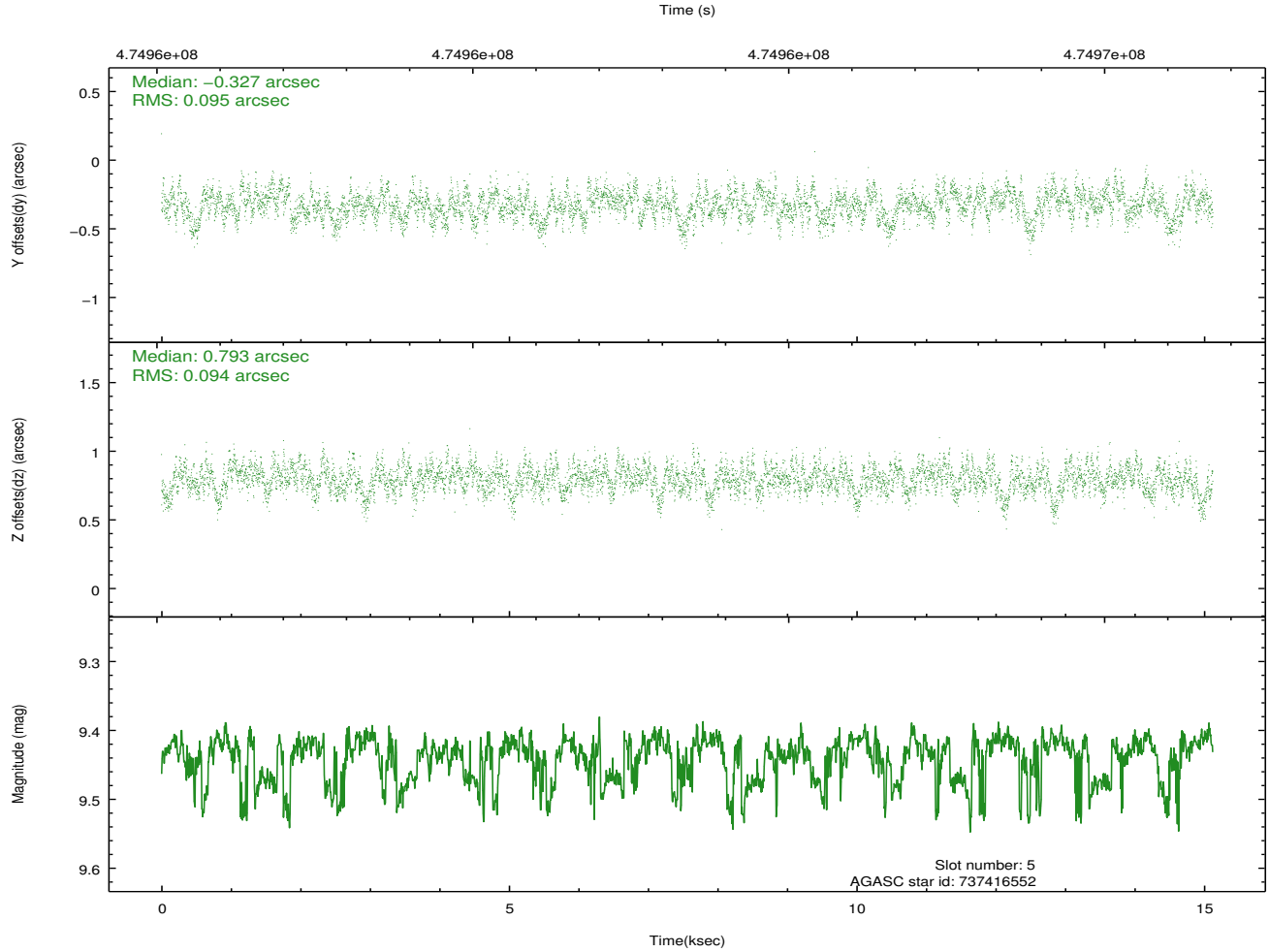

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.206 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 735716872


Time (s)
4.7496e+08
4.7496e+08
4.7496e+08
4.7497e+08
Median: 0.034 arcsec
RMS: 0.064 arcsec
Y offsets(dy) (arcsec)
Median: −0.204 arcsec
RMS: 0.035 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 735716872
Time(ksec)

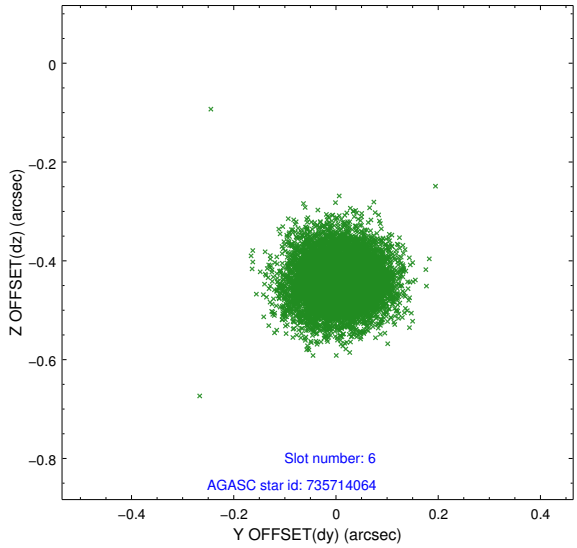
2.4.3 Slot 5

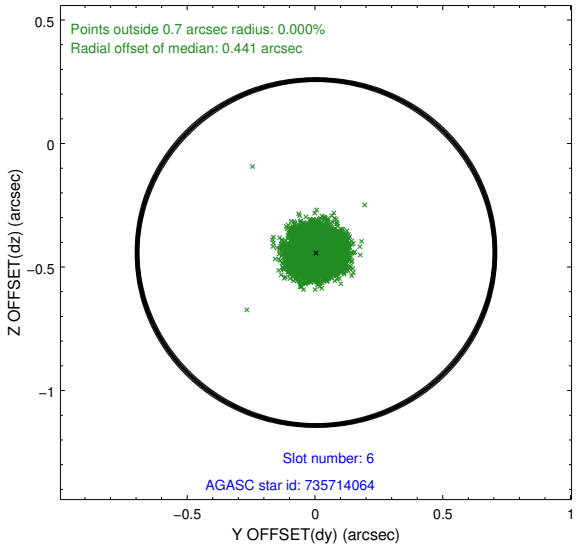

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 737416552

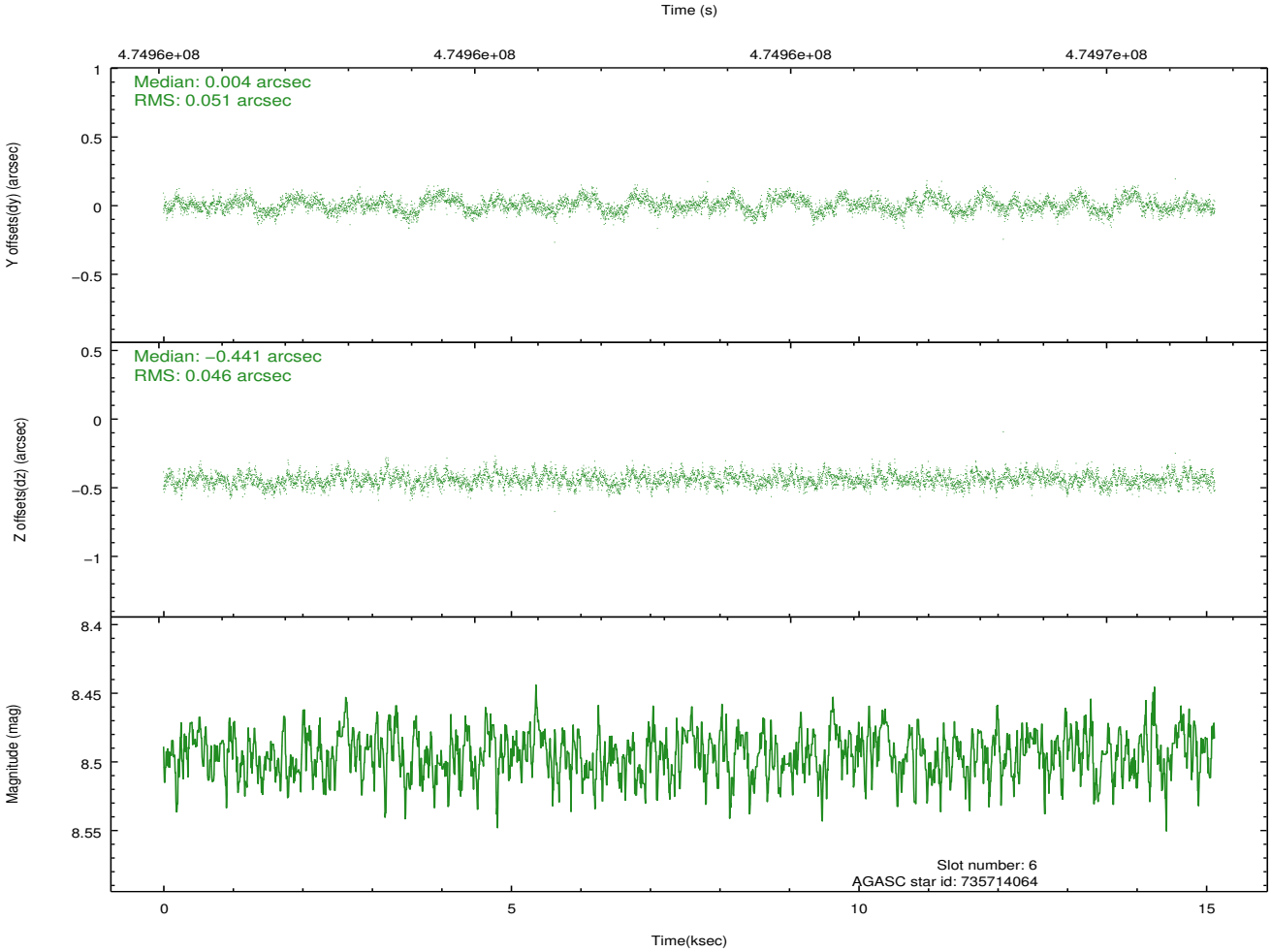

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.858 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 737416552


Time (s)
Median: −0.327 arcsec
RMS: 0.095 arcsec
Y offsets(dy) (arcsec)
Median: 0.793 arcsec
RMS: 0.094 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 737416552
Time(ksec)

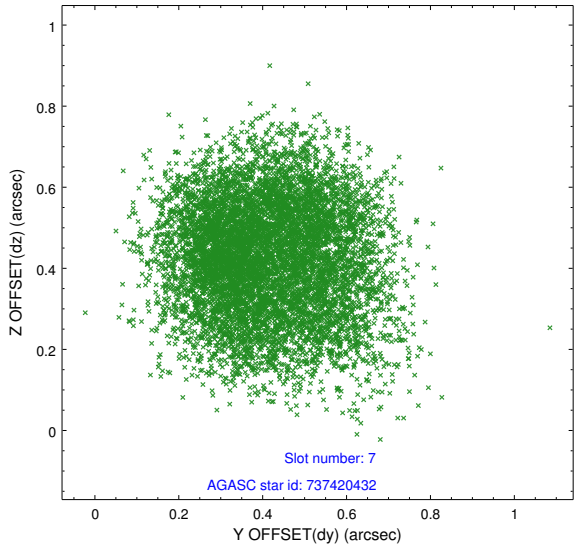
2.4.4 Slot 6

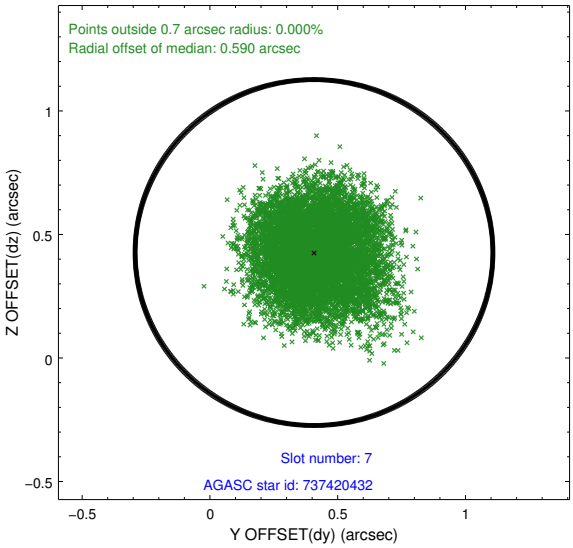

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 735714064

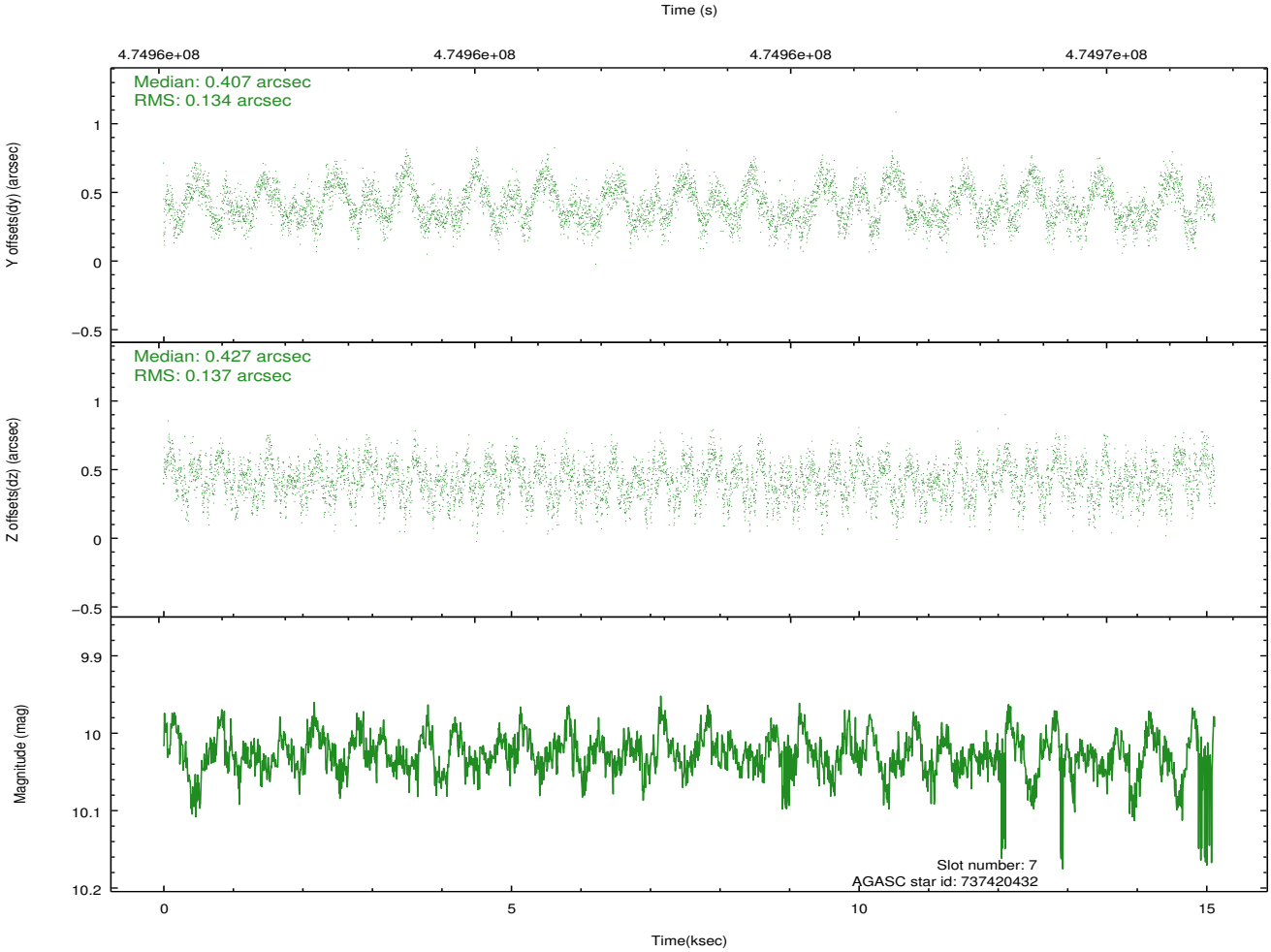

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.441 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 735714064


Time (s)
4.7496e+08
4.7496e+08
4.7496e+08
4.7497e+08
Median: 0.004 arcsec
RMS: 0.051 arcsec
Y offsets(dy) (arcsec)
Median: −0.441 arcsec
RMS: 0.046 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 735714064
Time(ksec)

2.4.5 Slot 7

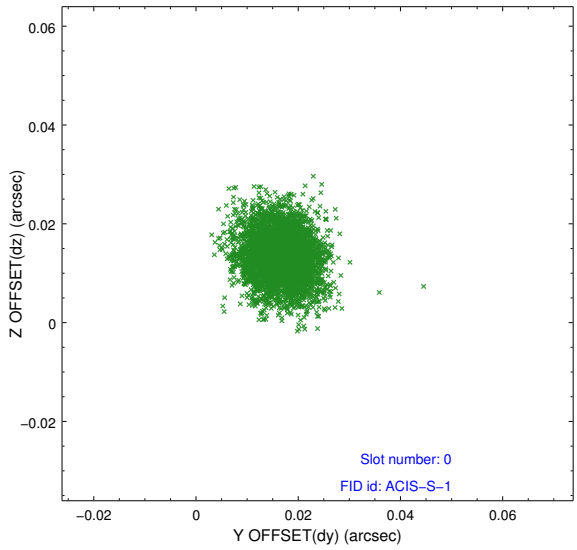

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 737420432

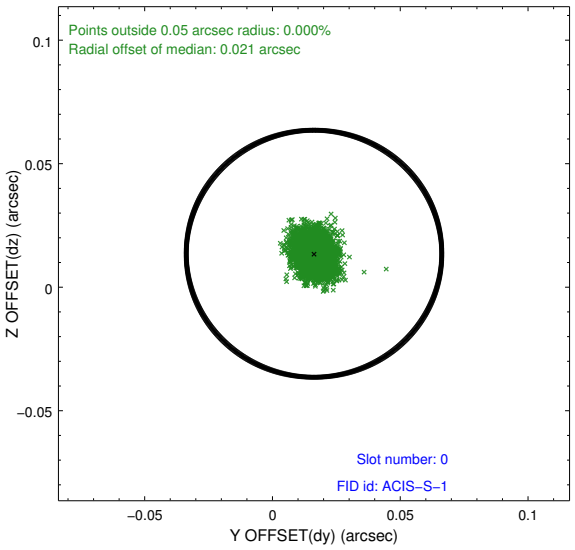

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.590 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 737420432

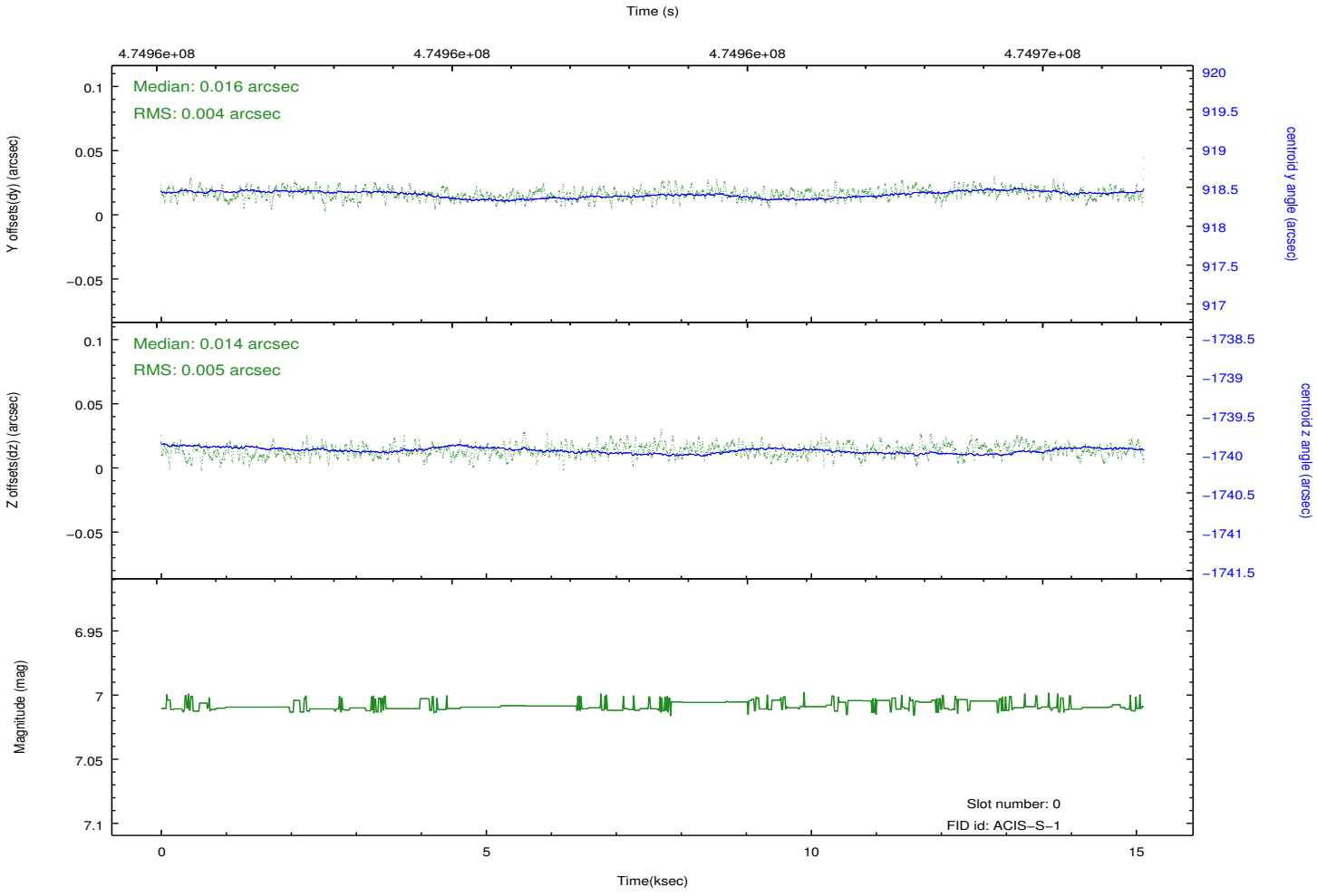

Time (s)
4.7496e+08
4.7496e+08
4.7496e+08
4.7497e+08
Median: 0.407 arcsec
RMS: 0.134 arcsec
Y offsets(dy) (arcsec)
Median: 0.427 arcsec
RMS: 0.137 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 737420432
Time(ksec)

2.5 FID Slots

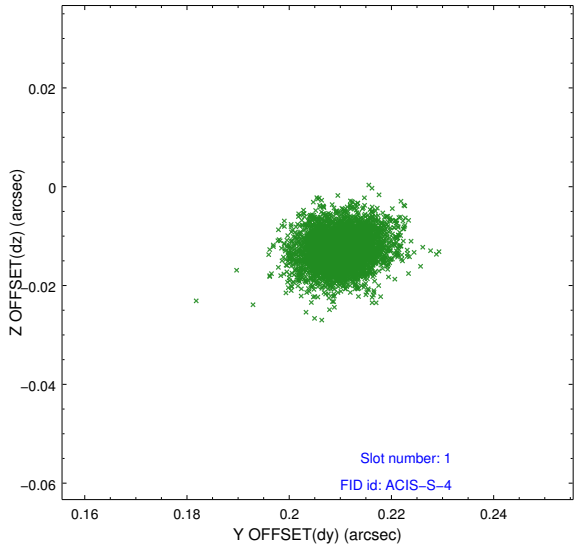
2.5.1 Slot 0

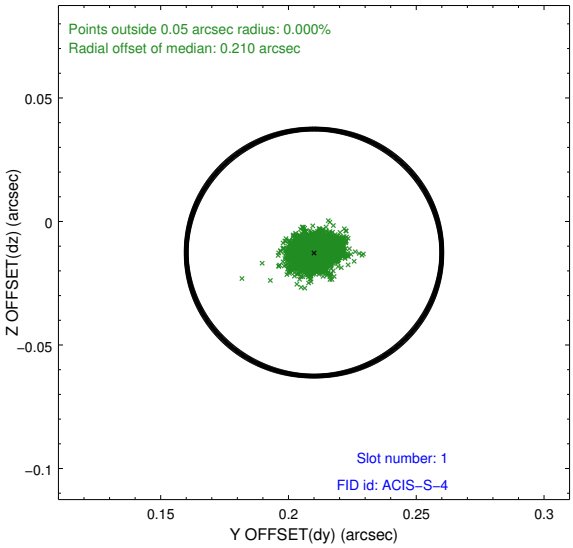


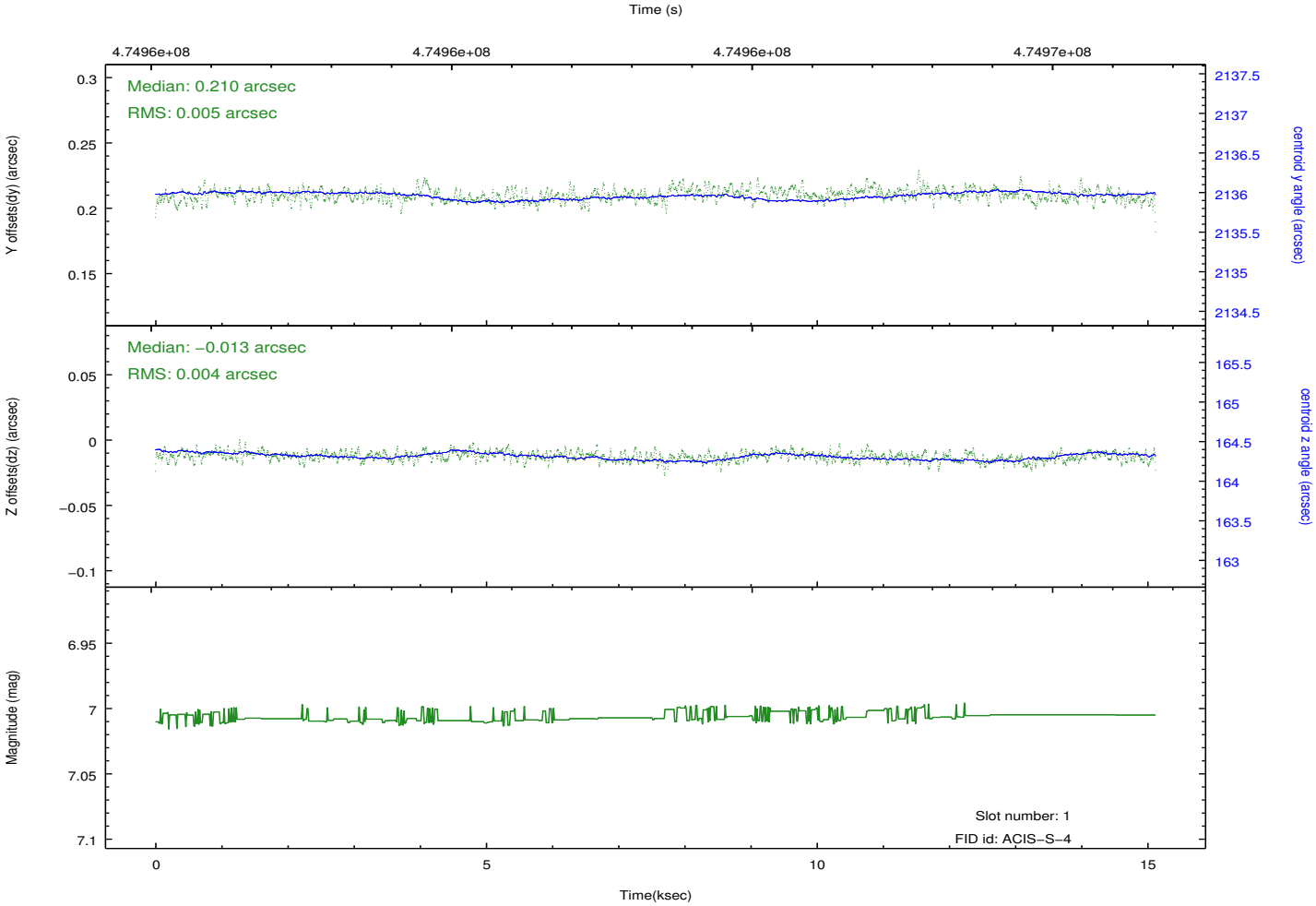




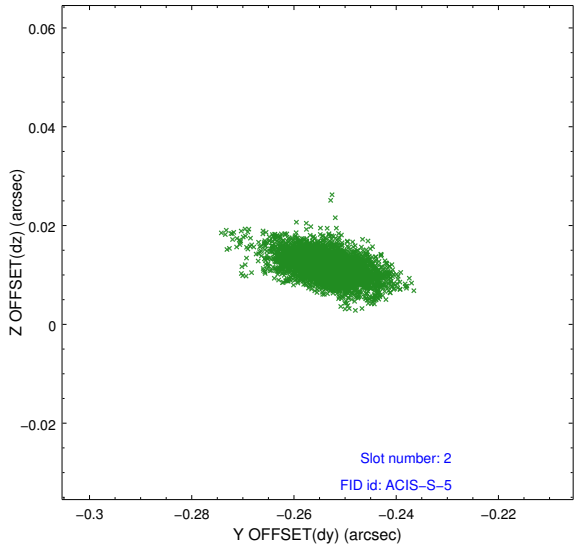
2.5.2 Slot 1

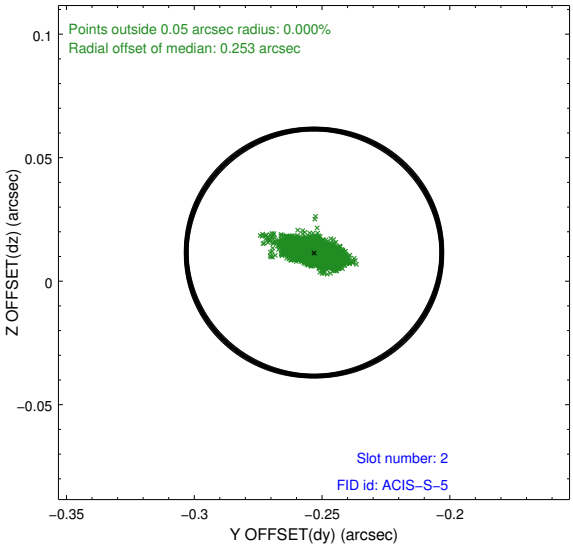

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

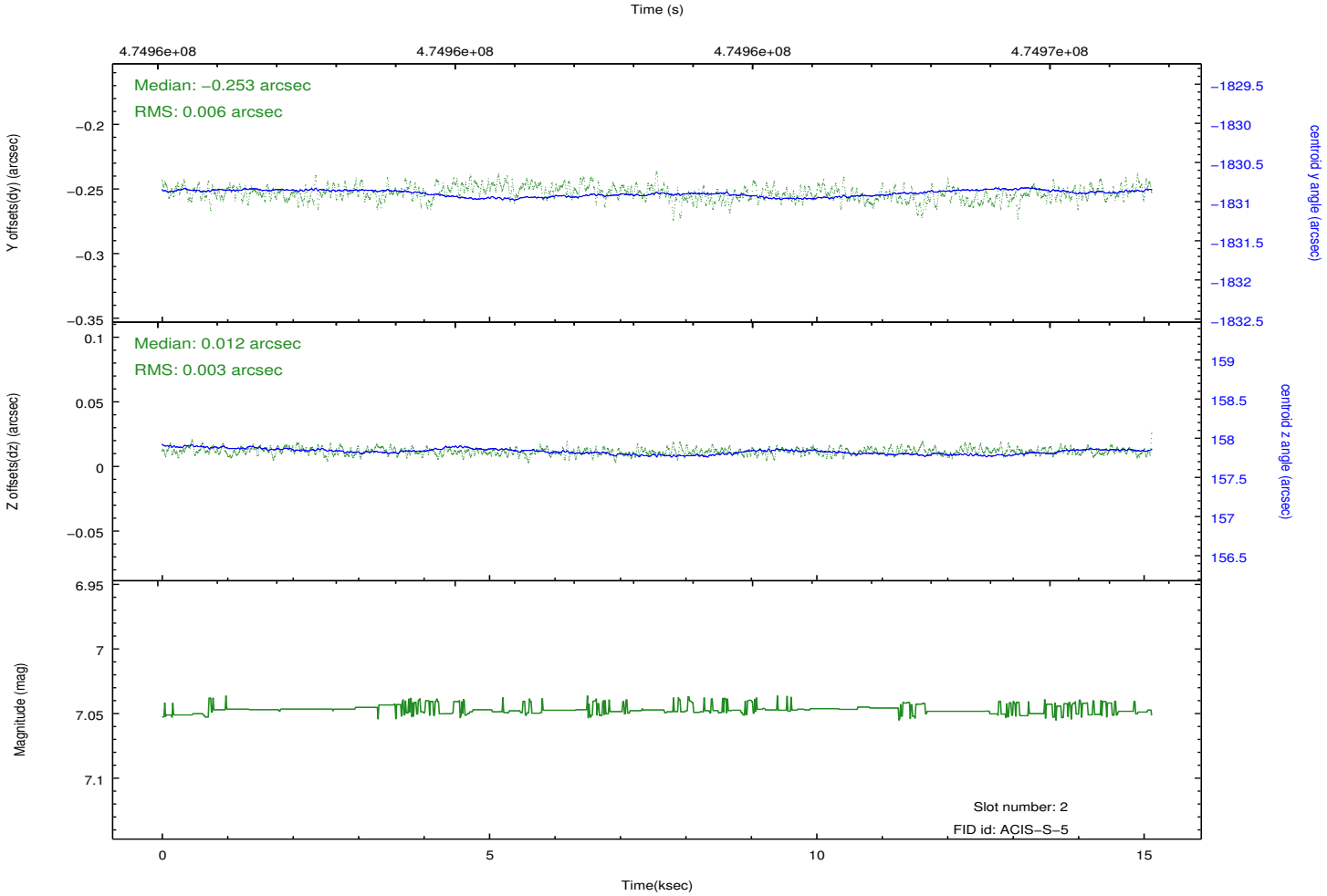

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.210 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.210 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.013 arcsec
RMS: 0.004 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: 0.000%
Radial offset of median: 0.253 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.253 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
Median: 0.012 arcsec
RMS: 0.003 arcsec
Z offsets(dz) (arcsec)
centroid y angle (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	Jen Lauer
V&V Date (YYYY-MM-DD)	2014.12.19
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	14.968919402361

A.2 Comments

A spatial region of the original bias map for CCD = 6 suffered from anomalously high data values. Pixels in the event data that were bias-corrected by one of the original affected bias pixels may have an apparent energy shift. While the change in energy is expected to be small (~20 eV), it depends on many parameters that have not yet been fully explored for this bias anomaly. The bias map for CCD = 6 has been reconstructed for this processing to remove this anomaly using scaled data from a comparable bias map from another observation. The pixels affected by the anomaly are bounded by sky coords: (244.78269,-7.71900),(244.78175,-7.72170),(244.91491,-7.76736),(244.9158 5,-7.76465)

==========
These data have been reprocessed with new aspect alignment calibration files that correct small mean offsets (up to 0.4 arcsecs) and improve overall astrometric accuracy. The new calibration was determined using data from the time period being reprocessed and was performed using cross-correlation of X-ray sources with radio and optical counterparts.