V&V Reference Report
L2 ASCDS Version : 10.1.1

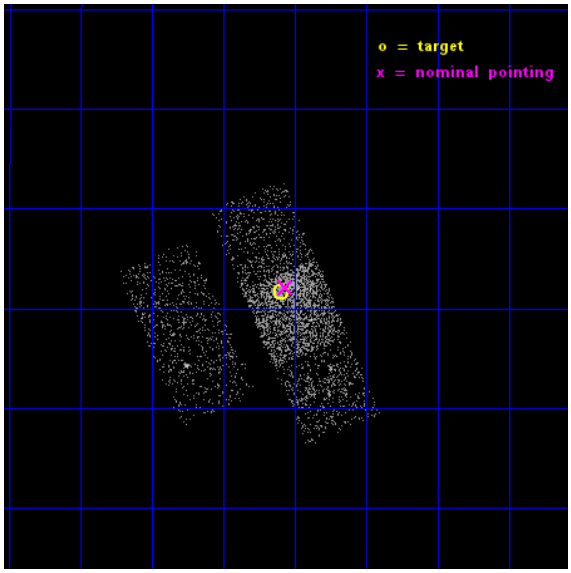
Observation 16494 - L2 Version 3
Chandra X-Ray Center

L2 Processing Date : Dec 7 2014

Contents

1 Front

seq_num	100132	Sequence number
obs_id	16494	Observation id
title	Plumbing the Heights of the Solar Wind With Comet ISON	Proposal ti
observer	Dr. Carey Lisse	Principal investigator
object	Comet C/2012 S1 (ISON)	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	170.9	Observer's specified target RA [deg]
dec_targ	4.86	Observer's specified target Dec [deg]
ra_nom	170.89205411749	Nominal RA [deg]
dec_nom	4.8685688779447	Nominal Dec [deg]
roll_nom	66.292803571916	Nominal Roll [deg]
revision	3	Processing version of data
ontime	4681.0000360012	Sum of GTIs [s]
livetime	4619.8393244288	Livetime [s]
ontime2	4681.0000360012	Sum of GTIs [s]
ontime3	4681.0000360012	Sum of GTIs [s]
ontime6	4681.0000360012	Sum of GTIs [s]
ontime7	4681.0000360012	Sum of GTIs [s]
ontime8	4681.0000360012	Sum of GTIs [s]
l2events	5019	Number of level 2 events

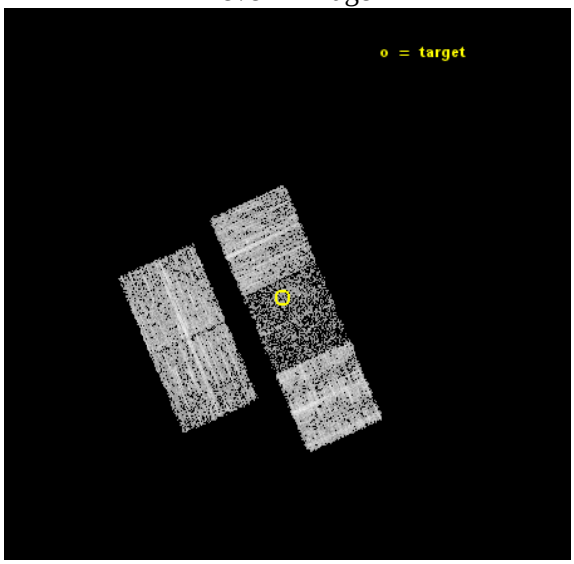


2 OBI

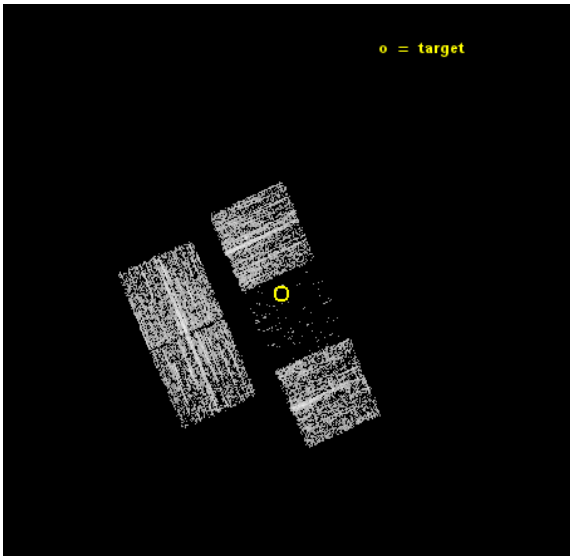
2.1 OBI

2.1.1 Images

Level 1 Image

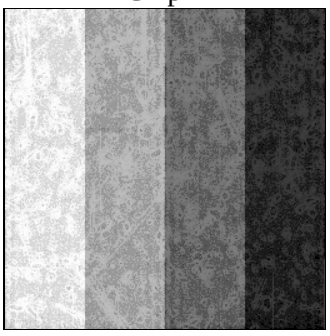


Level 1 Bad Events

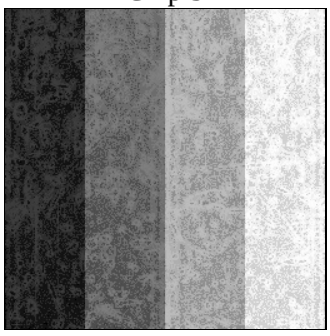


2.1.2 Bias

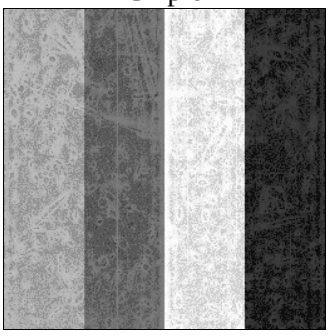
Chip 2



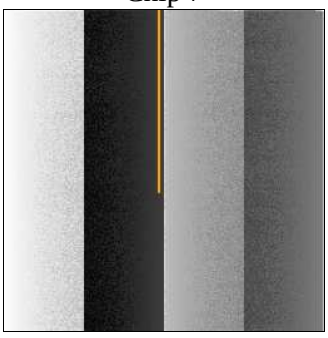
Chip 3



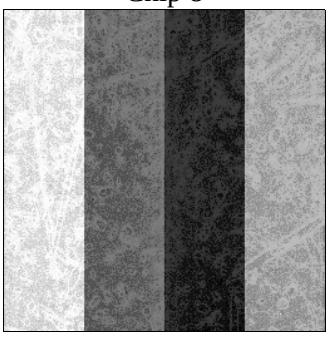
Chip 6



Chip 7



Chip 8



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	10.3.1	Processing system revision
caldbver	4.6.4	
date	2014-12-07T19:10:12	Date and time of file creation
revision	3	Processing version of data

sched_exp_time	4500.000000	[s] Scheduled observation exposure time
ontime	4681.0000360012	Sum of GTIs [s]
ontime2	4681.0000360012	Sum of GTIs [s]
ontime3	4681.0000360012	Sum of GTIs [s]
ontime6	4681.0000360012	Sum of GTIs [s]
ontime7	4681.0000360012	Sum of GTIs [s]
ontime8	4681.0000360012	Sum of GTIs [s]
l1events	70190	Number of level 1 events

2.1.4 Events

	ccd 2	**ccd 3**	**ccd 6**	**ccd 7**	**ccd 8**
level 1 events	16918	14053	15700	3828	19691
rejected events	16029	13461	14810	808	13188
rejected %	94%	95%	94%	21%	66%

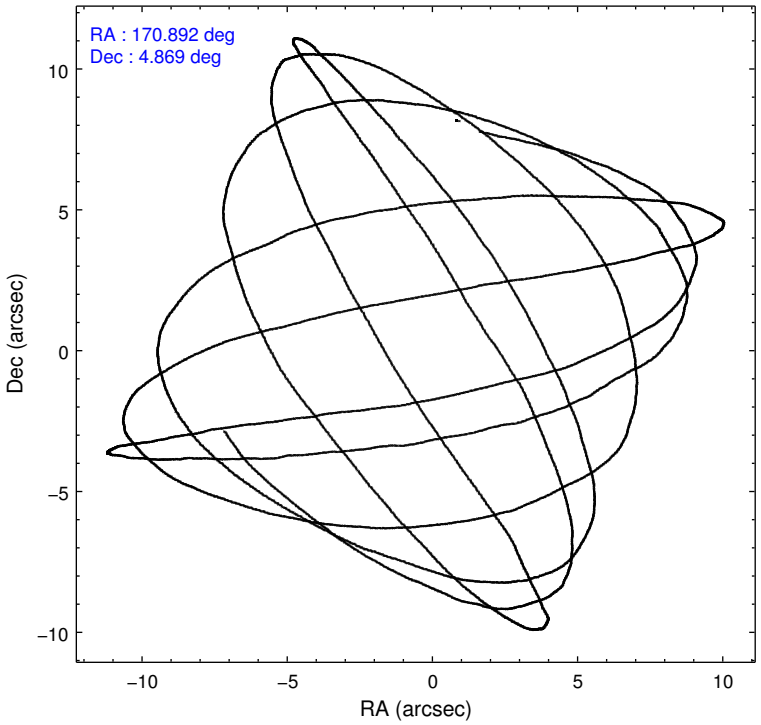
	ccd 2	**ccd 3**	**ccd 6**	**ccd 7**	**ccd 8**
grade 0 events	406	308	490	1036	2151
	2%	2%	3%	27%	10%
grade 1 events	4	9	4	29	16
	0%	0%	0%	0%	0%
grade 2 events	246	112	188	983	1502
	1%	0%	1%	25%	7%
grade 3 events	90	89	100	360	795
	0%	0%	0%	9%	4%
grade 4 events	105	71	96	363	752
	0%	0%	0%	9%	3%
grade 5 events	28	15	8	115	133
	0%	0%	0%	3%	0%
grade 6 events	76	45	50	361	1579
	0%	0%	0%	9%	8%
grade 7 events	15963	13404	14764	581	12763
	94%	95%	94%	15%	64%

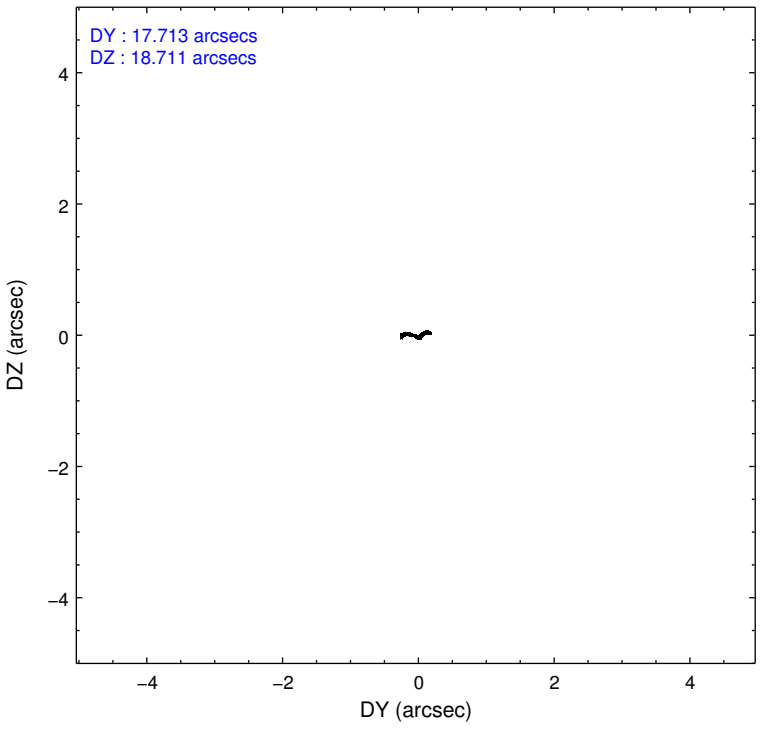
2.2 Compared Parameters

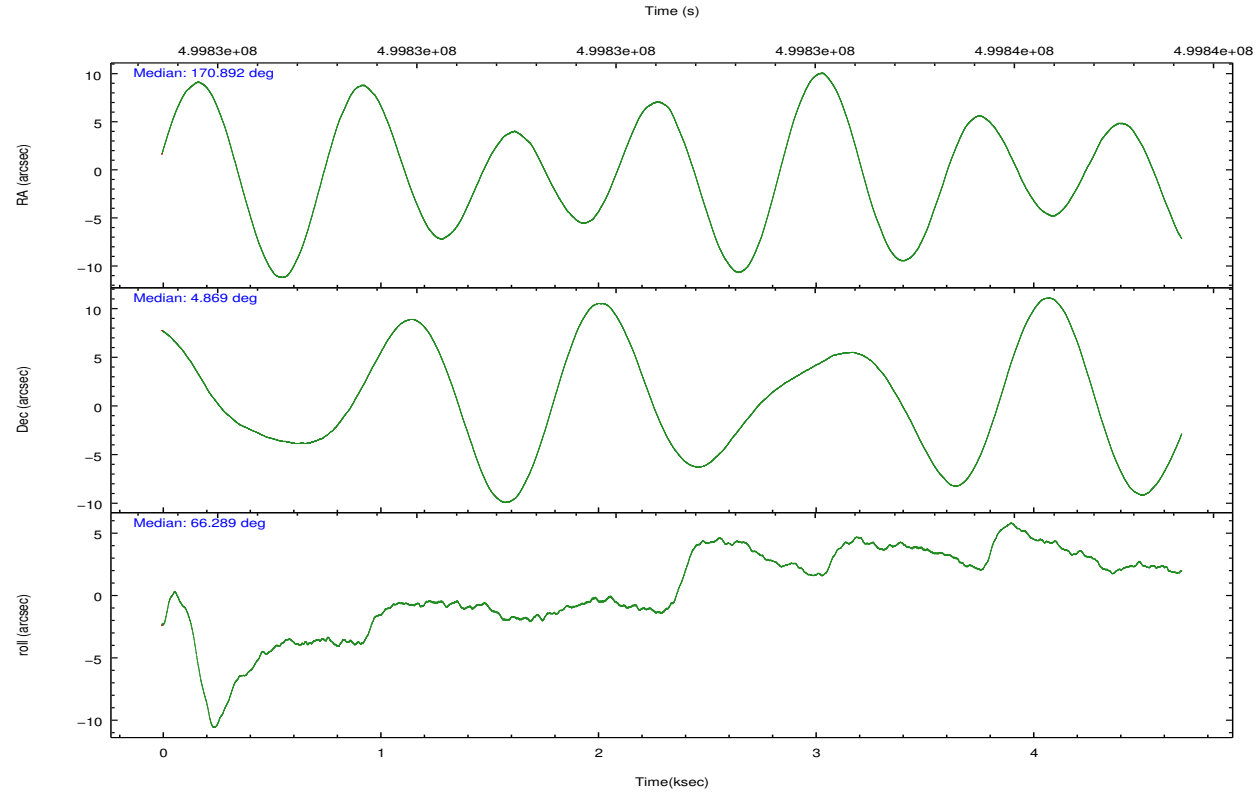
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-23678	ACIS-23678
Grating	NONE	NONE
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	170.895361	170.8920541174913
[deg] Pointing Dec	4.841486	4.868568877944665
[deg] Pointing Roll	66.135898	66.29280357191625
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1400660498719
[mm] SIM translation stage offset	0	0.00754346686406393
[s] Observation start time (MET)	499831124.184000	499830748.50232
Observation start date	2013-11-03T01:57:37	2013-11-03T01:52:28
[s] Observation end time (MET)	499835624.184000	499835818.1526
Observation end date	2013-11-03T03:12:37	2013-11-03T03:16:58
Read mode	TIMED	TIMED

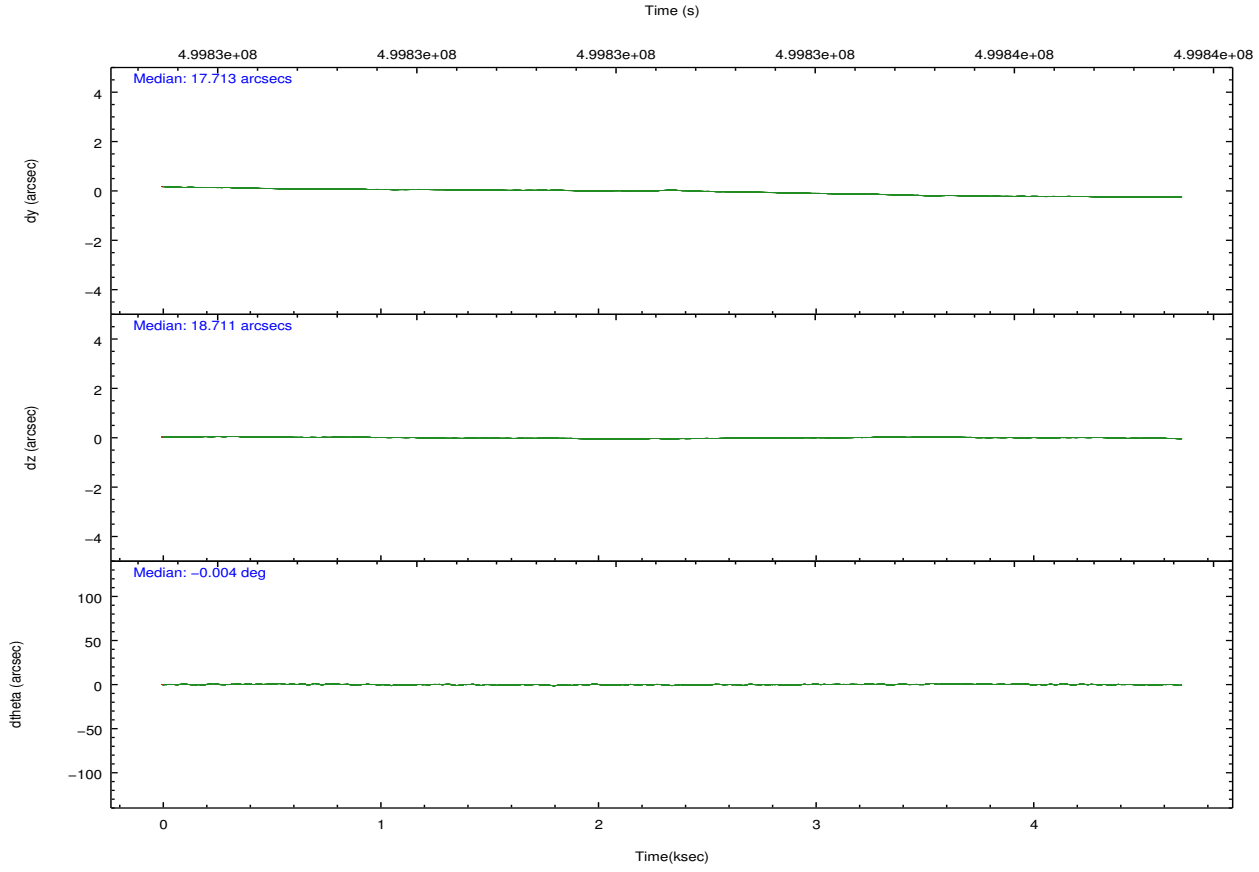
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.1

2.3 Aspect


RA : 170.892 deg
Dec : 4.869 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : 17.713 arcsecs
DZ : 18.711 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
4.9983e+08
4.9983e+08
4.9983e+08
4.9983e+08
4.9984e+08
4.9984e+08
Median: 170.892 deg
RA (arcsec)
Median: 4.869 deg
Dec (arcsec)
Median: 66.289 deg
roll (arcsec)
Time(ksec)

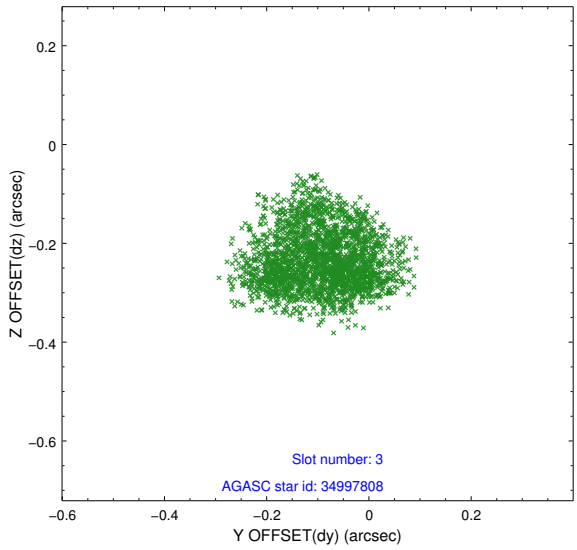

Time (s)
4.9983e+08
4.9983e+08
4.9983e+08
4.9983e+08
4.9984e+08
4.9984e+08
Median: 17.713 arcsecs
dy (arcsec)
Median: 18.711 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

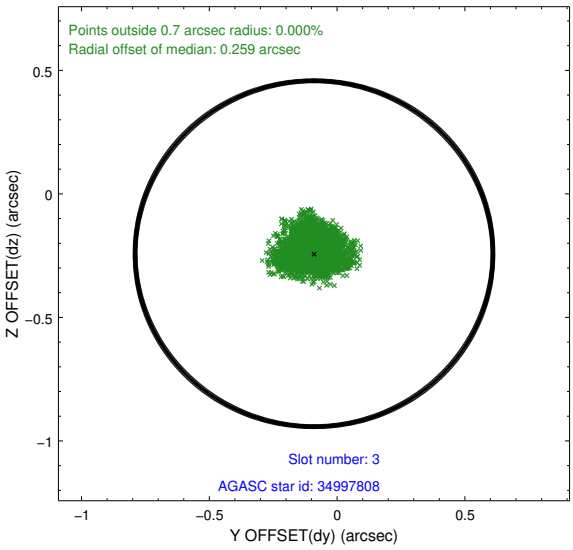
Slot Statistics

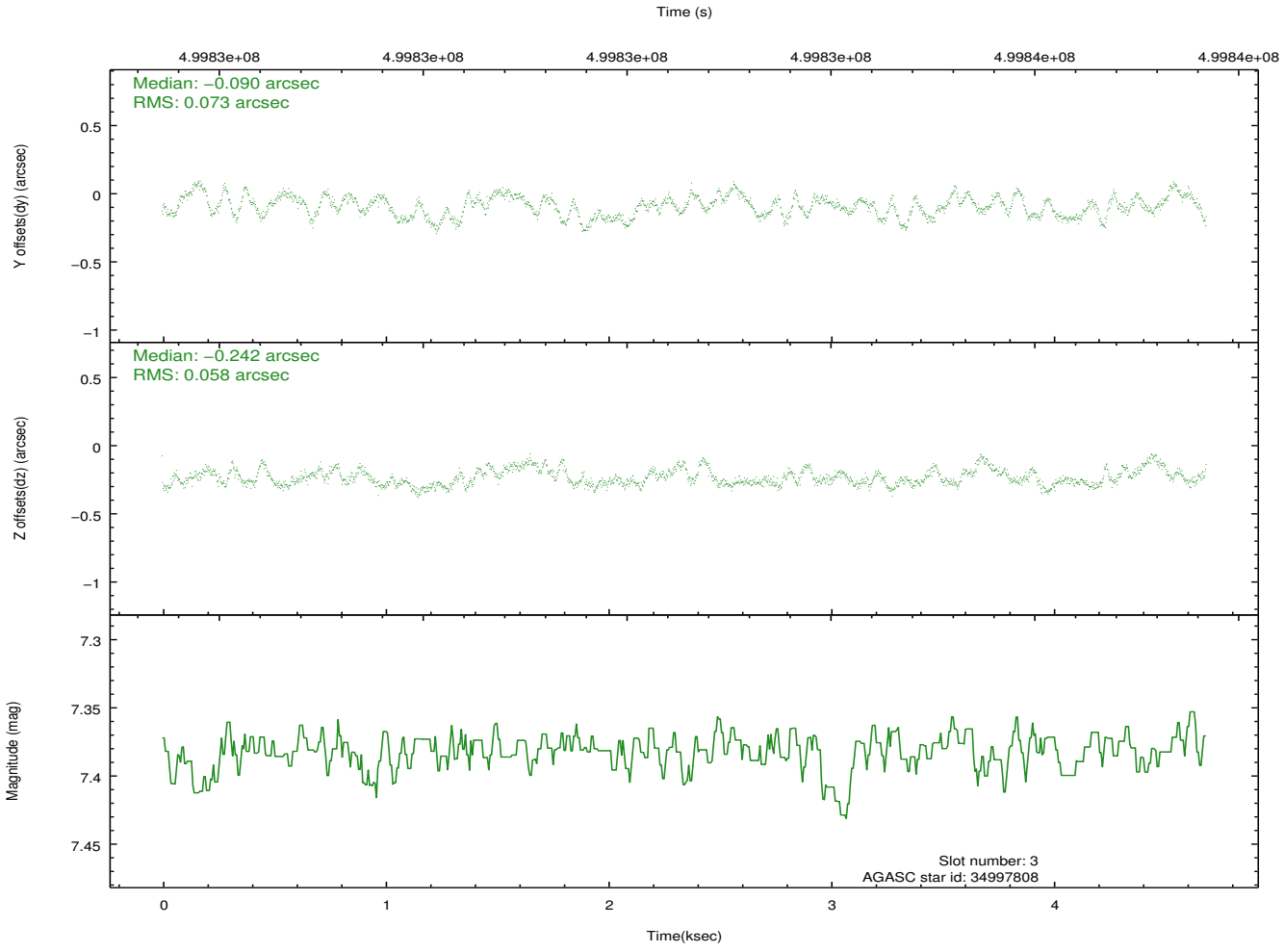
slot	status	used	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID		ACIS-S-2	7.01	1144	-0.090	-0.047	0.007	0.011	0.000000	0.000000	-770.81	-1740.23
1	FID		ACIS-S-4	7.10	1144	0.221	0.056	0.008	0.015	0.000000	0.000000	2142.19	166.97
2	FID		ACIS-S-5	7.13	1144	-0.163	-0.000	0.009	0.017	0.000000	0.000000	-1822.04	162.11
3	GUIDE	used	34997808	7.38	2287	-0.090	-0.242	0.103	0.152	170.245974	4.880514	-813.60	2188.11
4	GUIDE	used	35000432	9.66	2286	0.194	0.015	0.134	0.238	170.093243	4.604960	-1942.88	2288.60
5	GUIDE	used	35004328	9.90	2224	0.371	-0.026	0.171	0.284	170.461941	4.343562	-2268.53	699.03
6	GUIDE	used	35005040	9.64	2284	0.092	0.039	0.172	0.272	170.763404	4.828006	-238.18	413.10
7	GUIDE	used	35398072	9.97	2286	-0.558	0.192	0.166	0.269	171.222058	5.399121	2309.33	-257.04

2.4 Star Slots

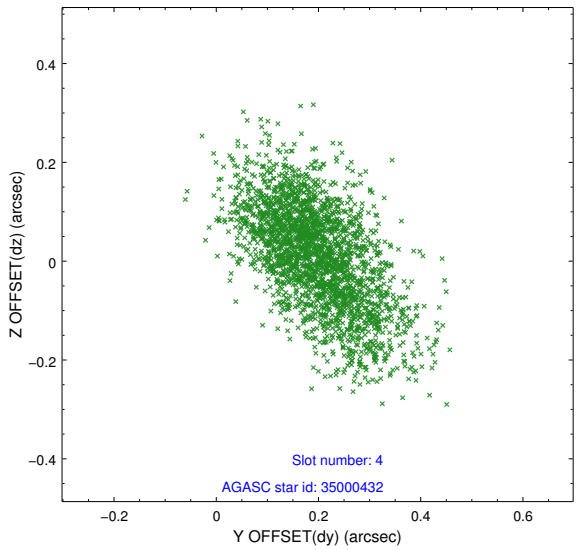
2.4.1 Slot 3

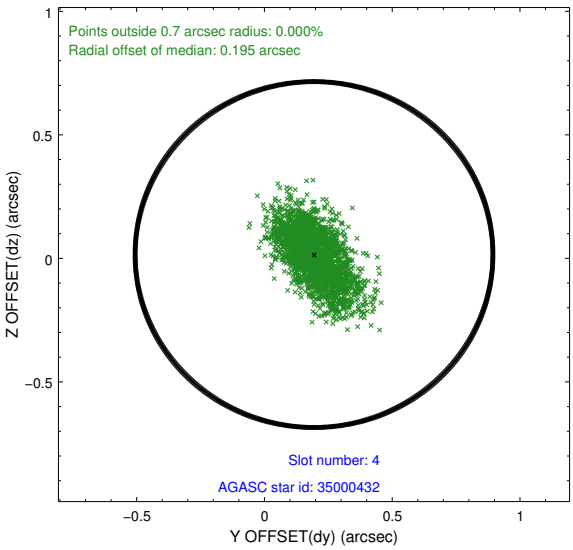


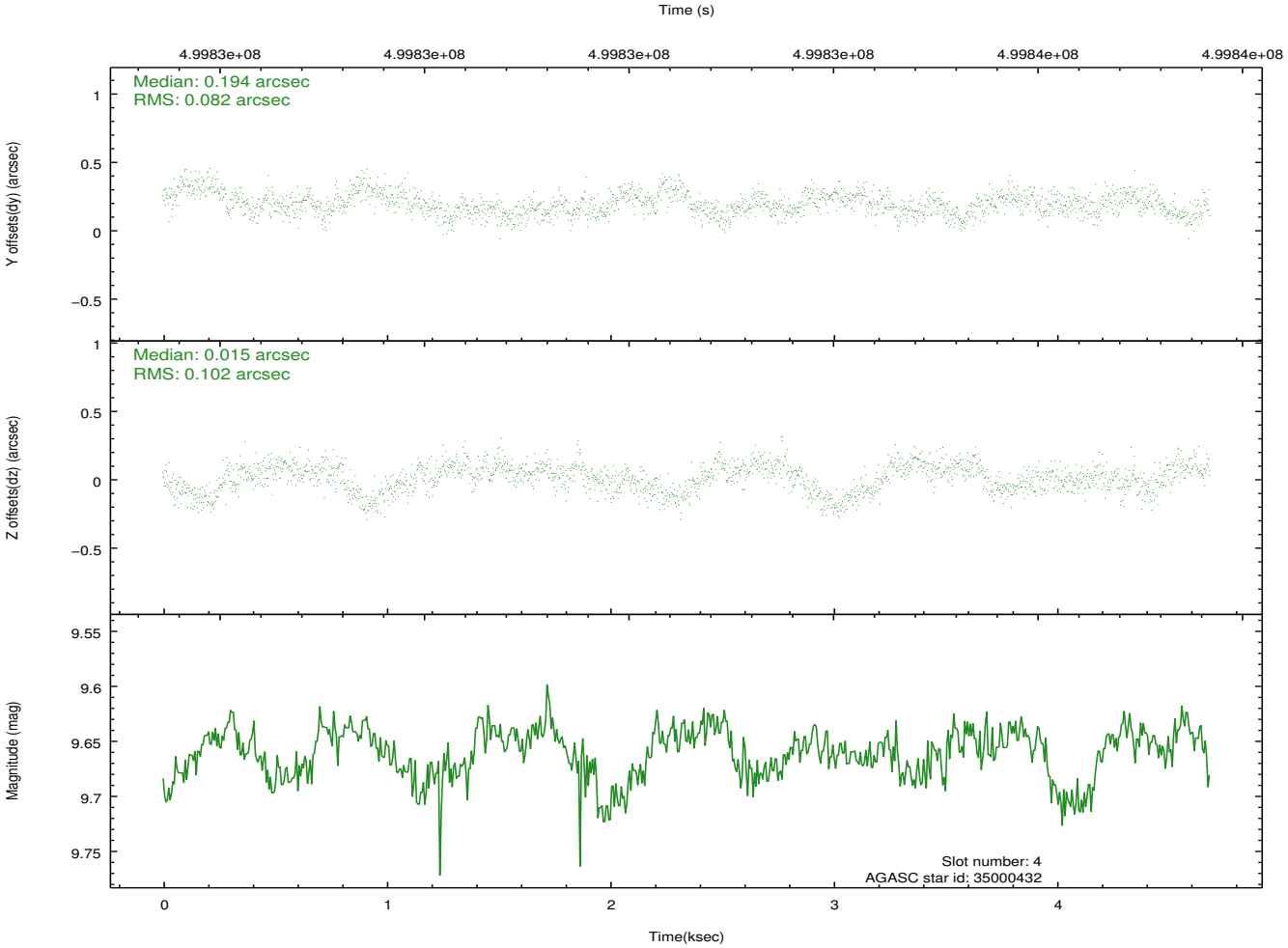




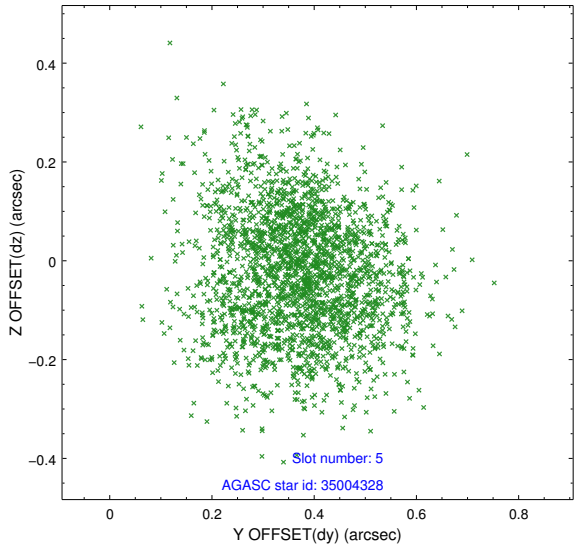
2.4.2 Slot 4

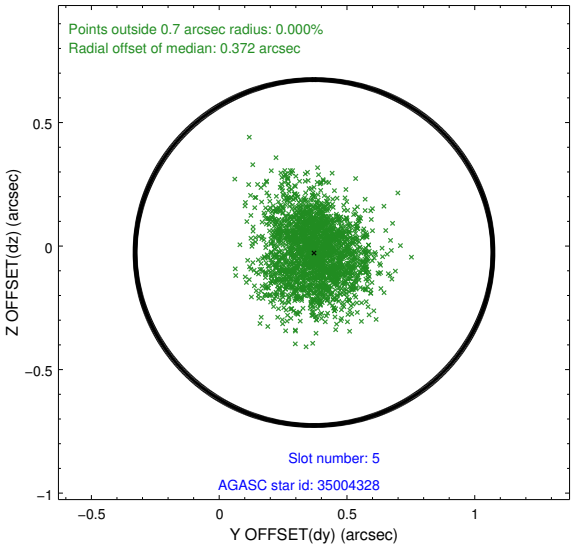

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 35000432

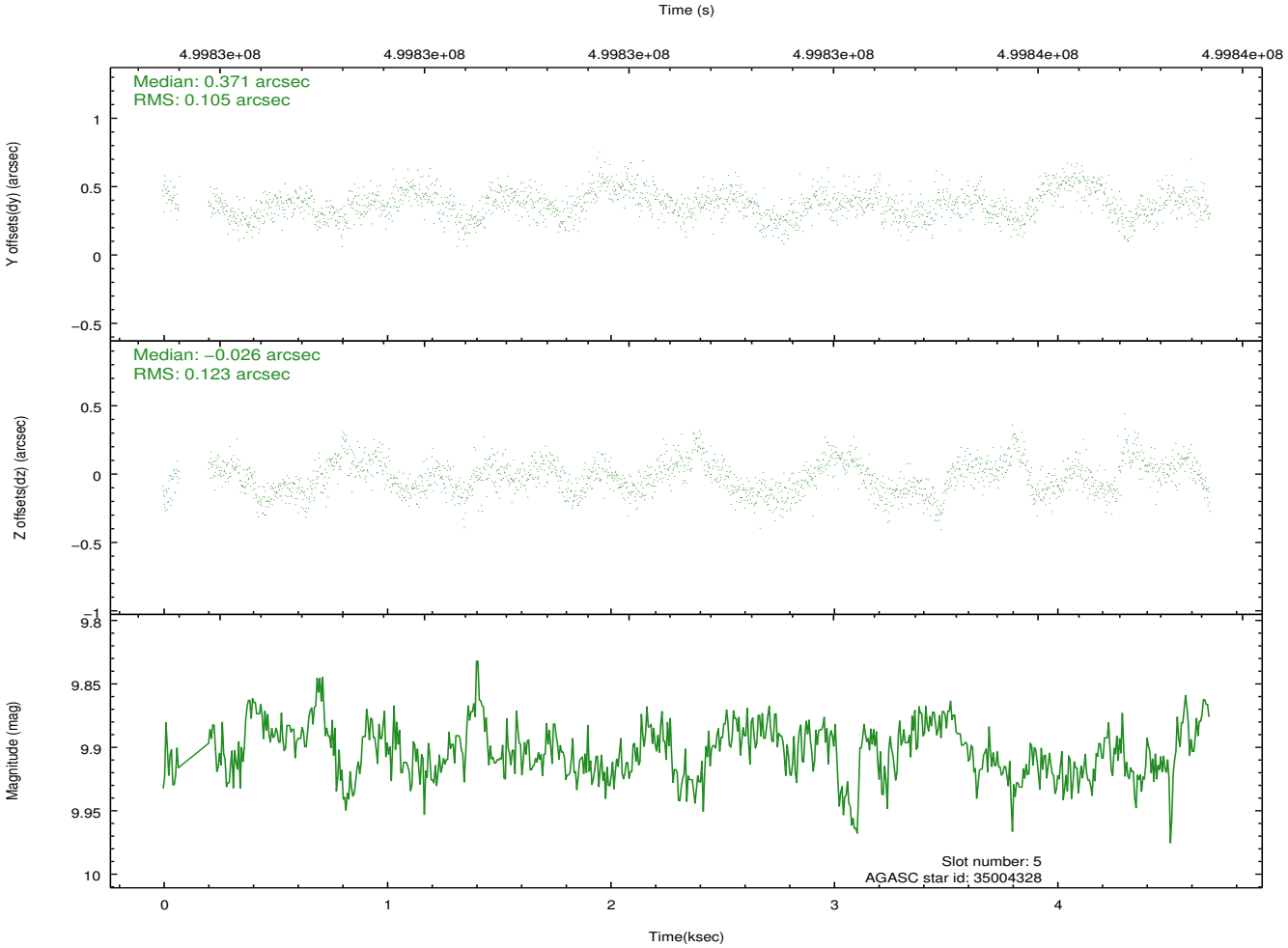

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.195 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 35000432


Time (s)
Median: 0.194 arcsec
RMS: 0.082 arcsec
Y offsets(dy) (arcsec)
Median: 0.015 arcsec
RMS: 0.102 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 35000432
Time(ksec)

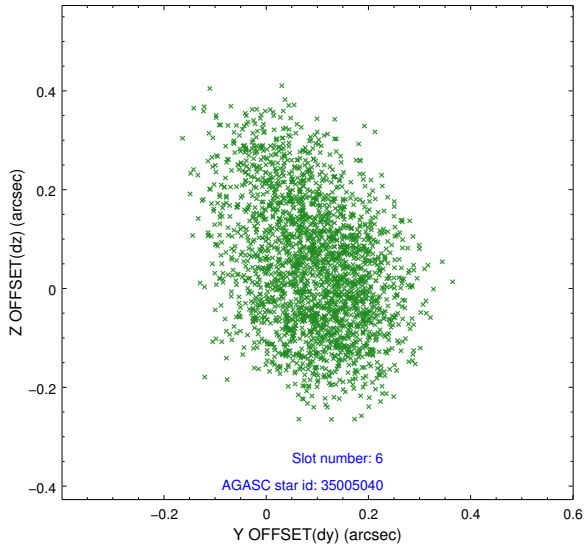
2.4.3 Slot 5

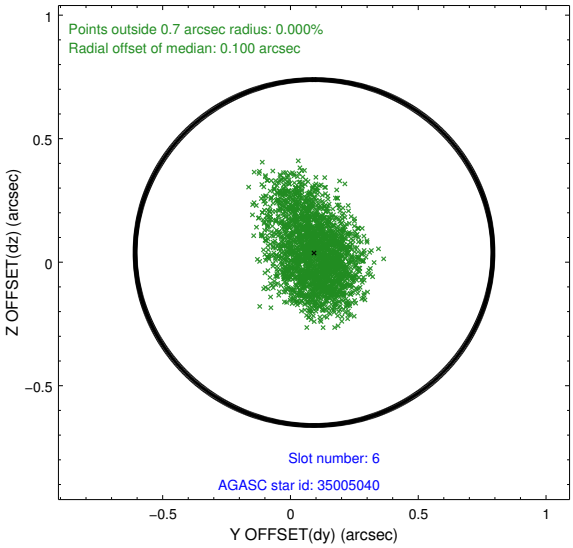

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 35004328

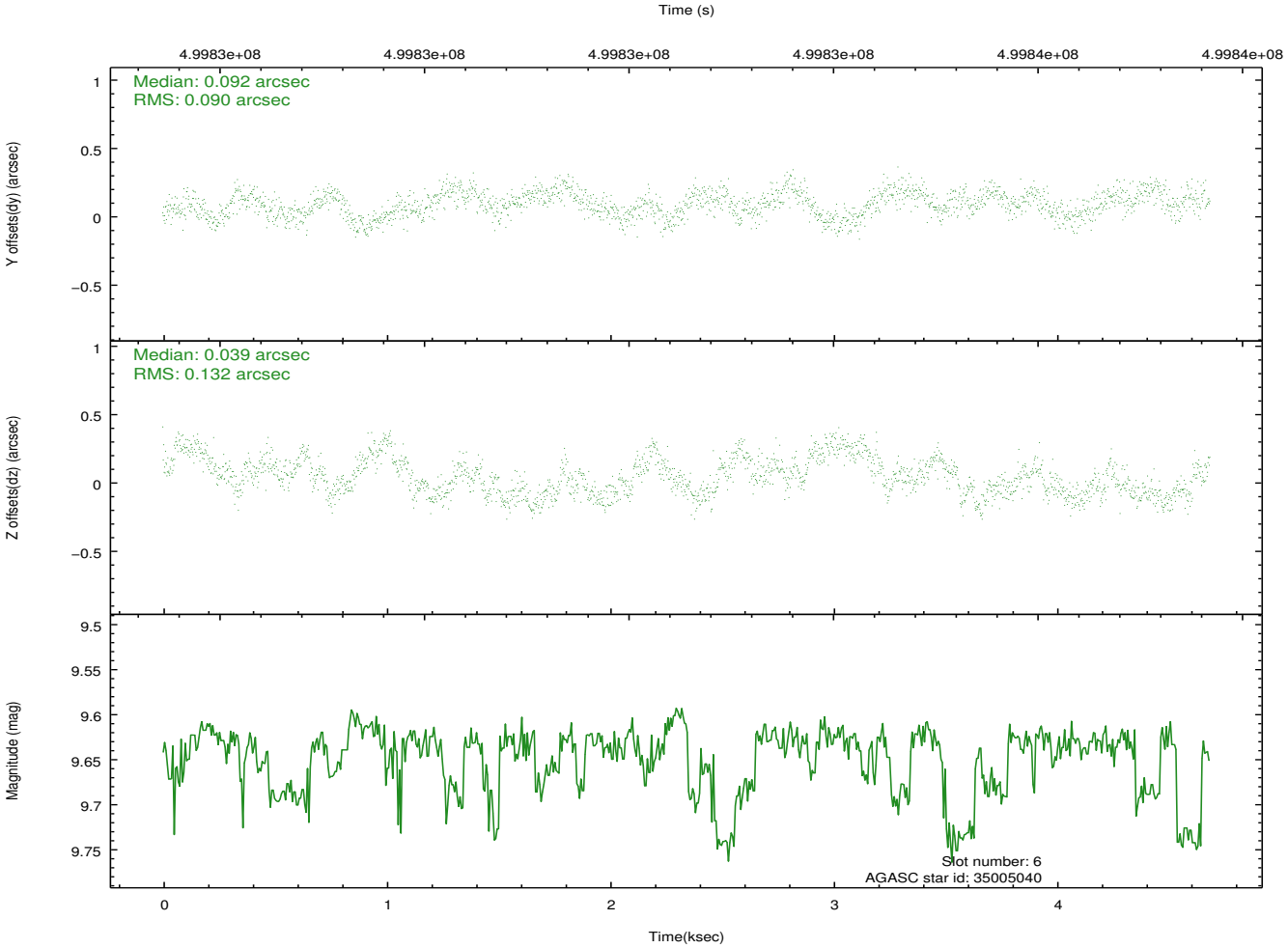

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.372 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 35004328


Time (s)
Median: 0.371 arcsec
RMS: 0.105 arcsec
Y offsets(dy) (arcsec)
Median: −0.026 arcsec
RMS: 0.123 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 35004328
Time(ksec)

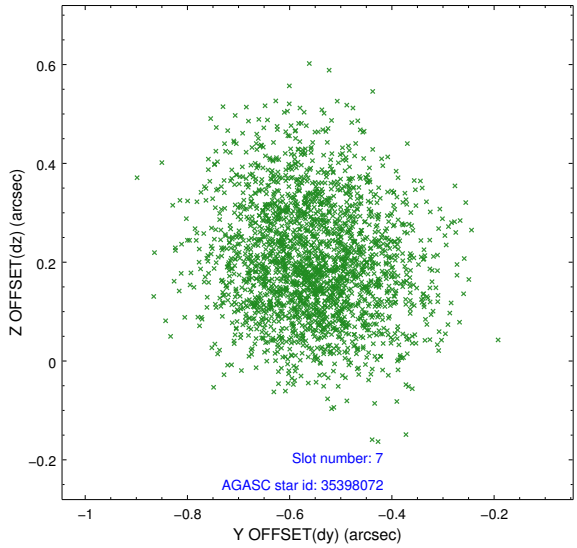
2.4.4 Slot 6

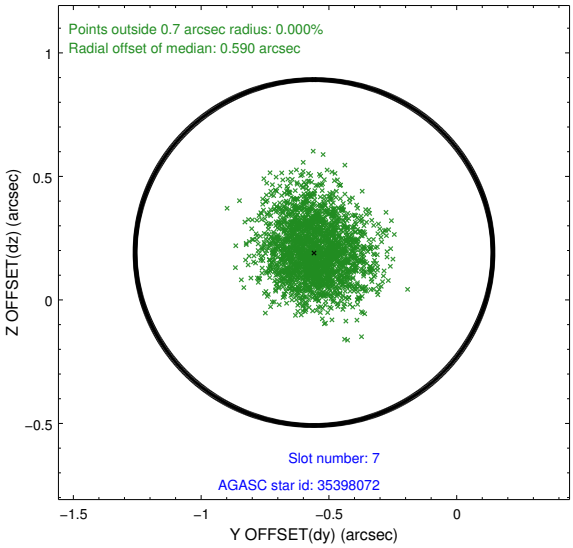

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 35005040

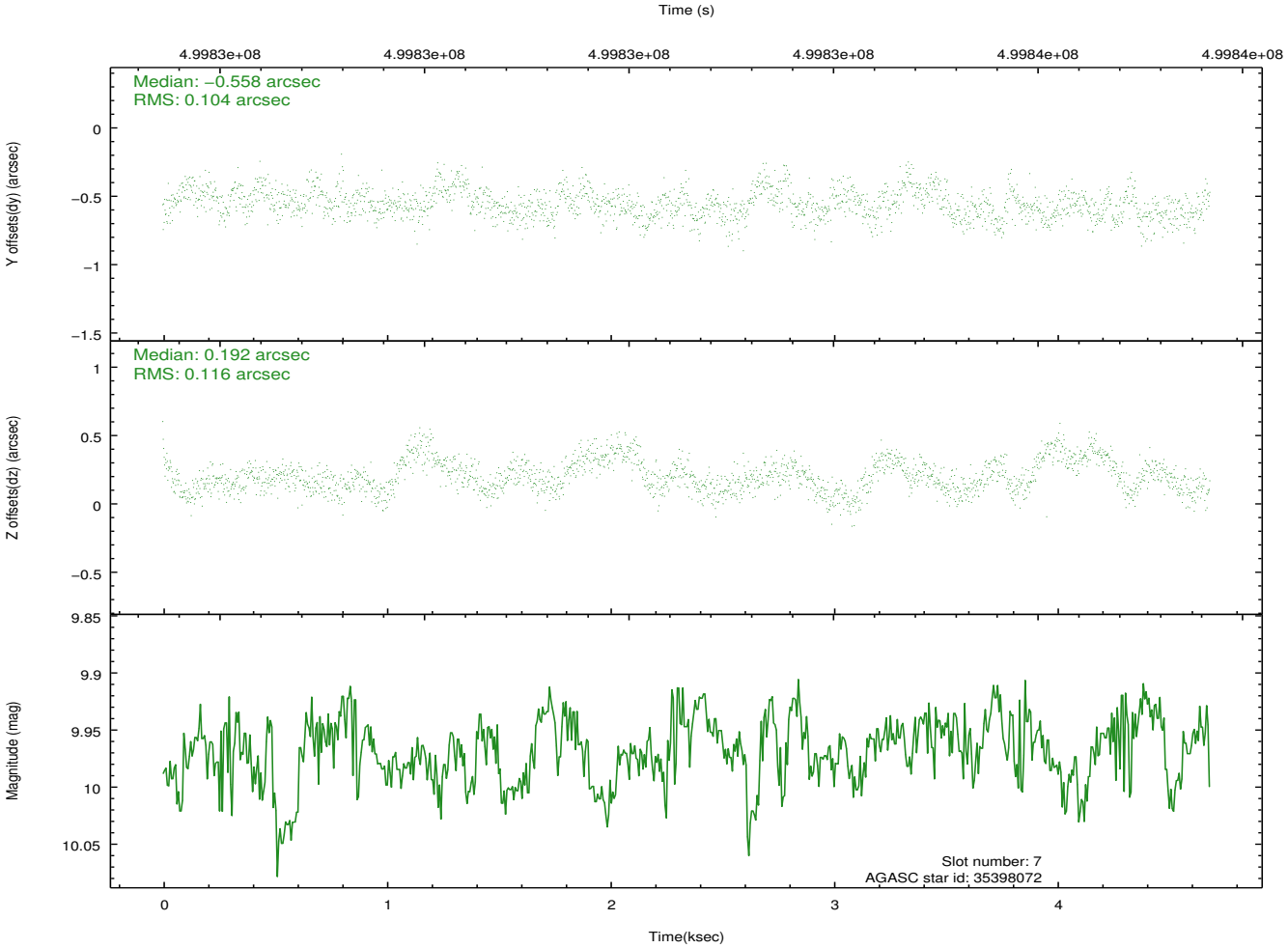

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.100 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 35005040


Time (s)
Median: 0.092 arcsec
RMS: 0.090 arcsec
Y offsets(dy) (arcsec)
Median: 0.039 arcsec
RMS: 0.132 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 35005040
Time(ksec)

2.4.5 Slot 7

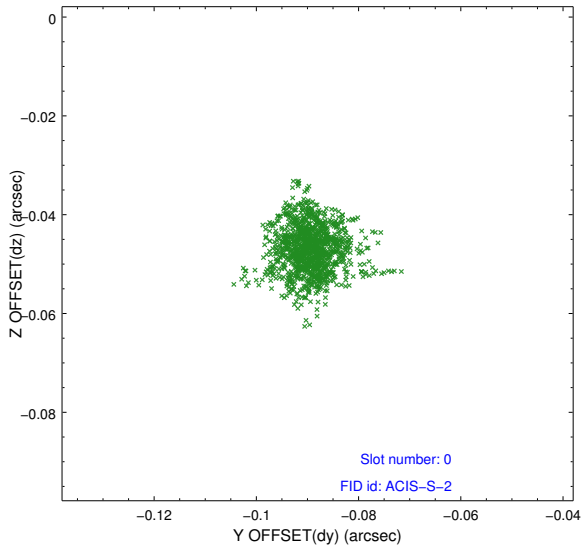

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 35398072

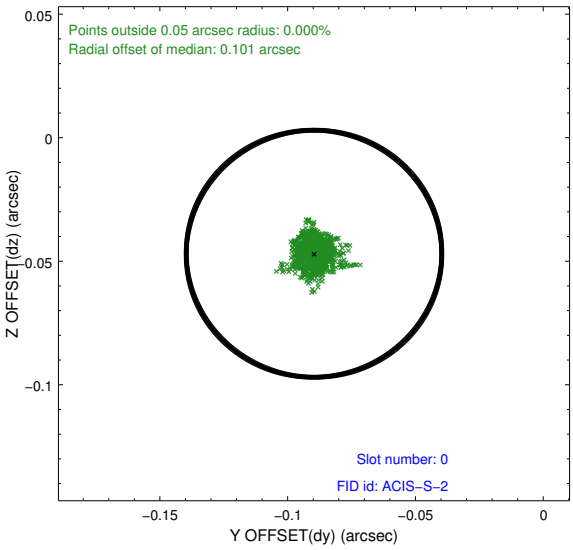

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.590 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 35398072

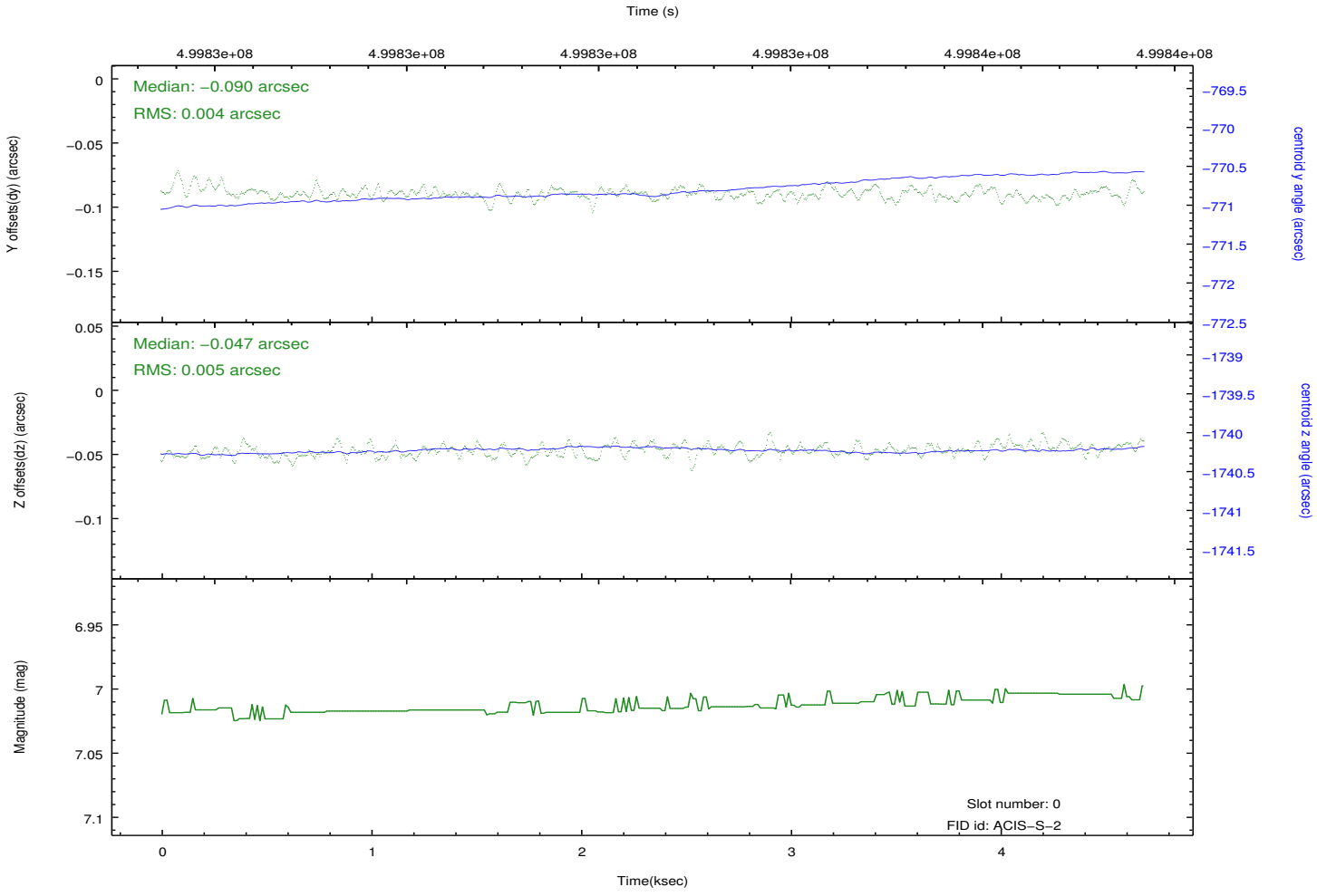

Time (s)
Median: −0.558 arcsec
RMS: 0.104 arcsec
Y offsets(dy) (arcsec)
Median: 0.192 arcsec
RMS: 0.116 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 35398072
Time(ksec)

2.5 FID Slots

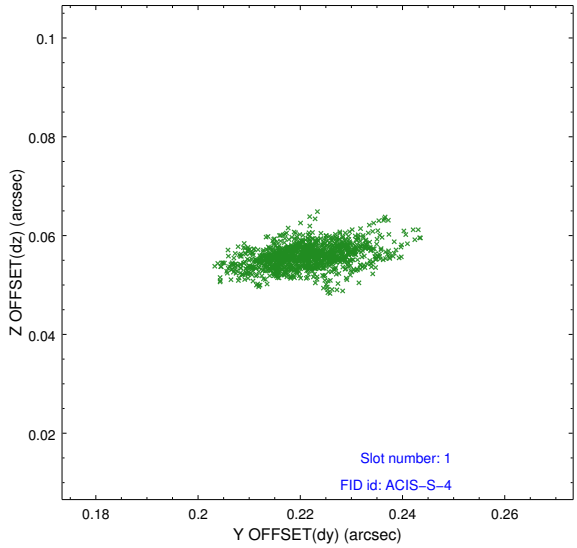
2.5.1 Slot 0

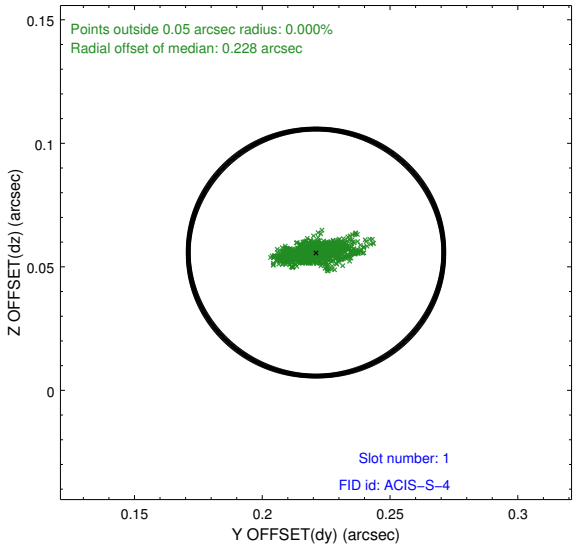


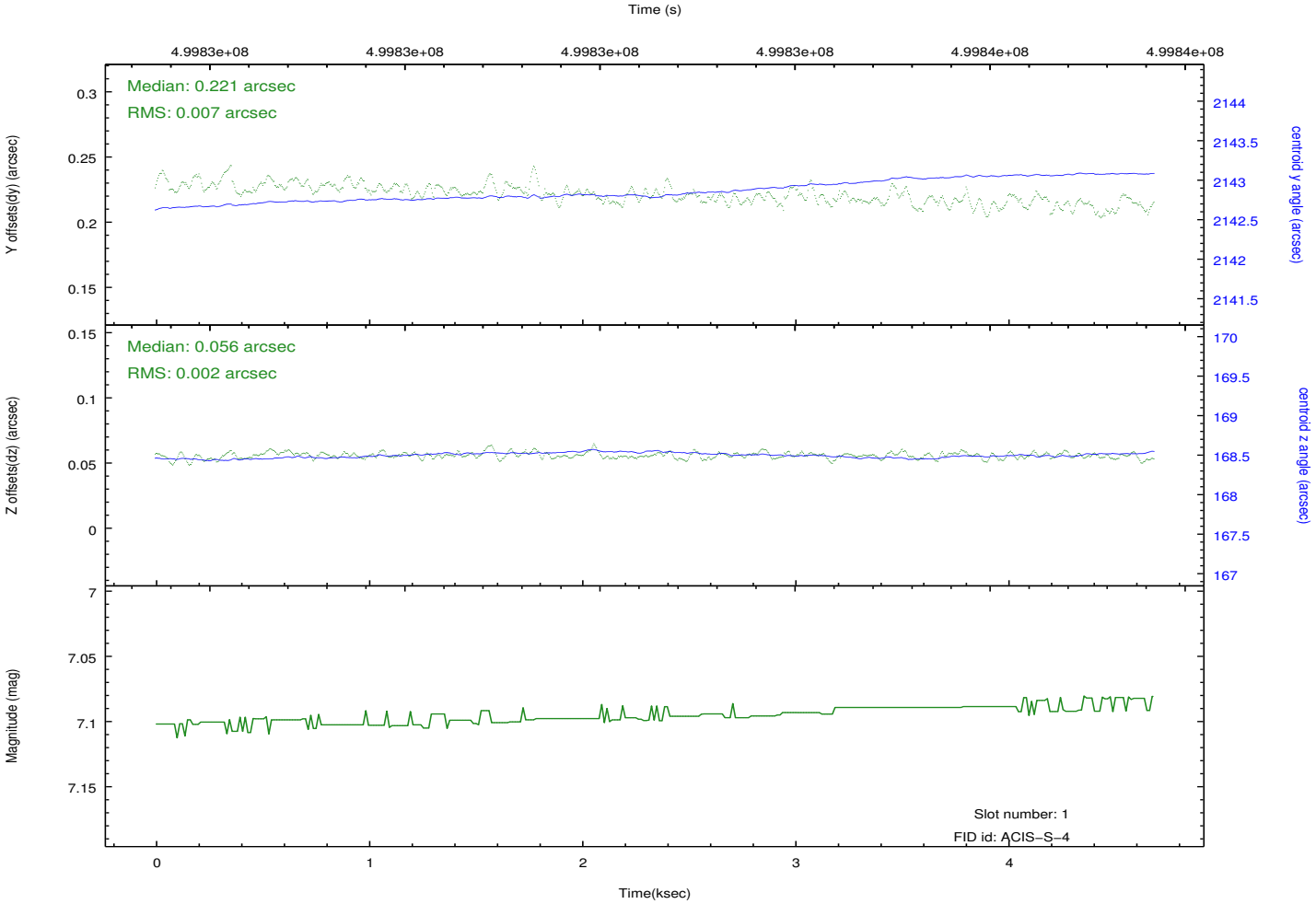




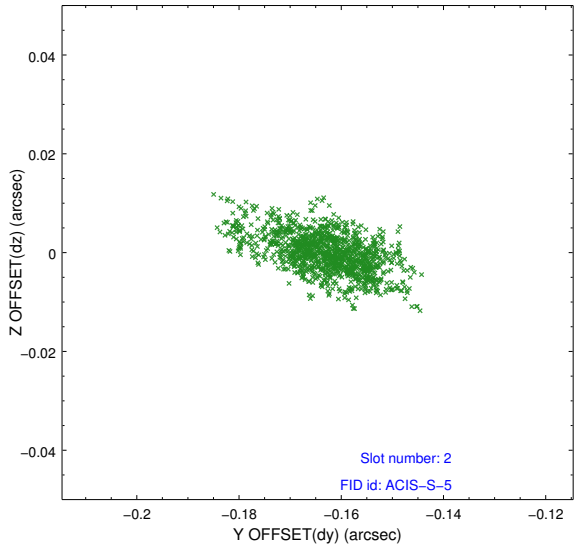
2.5.2 Slot 1

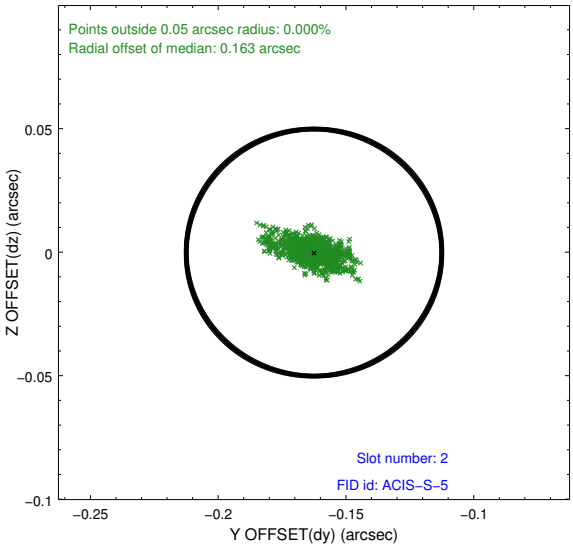

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

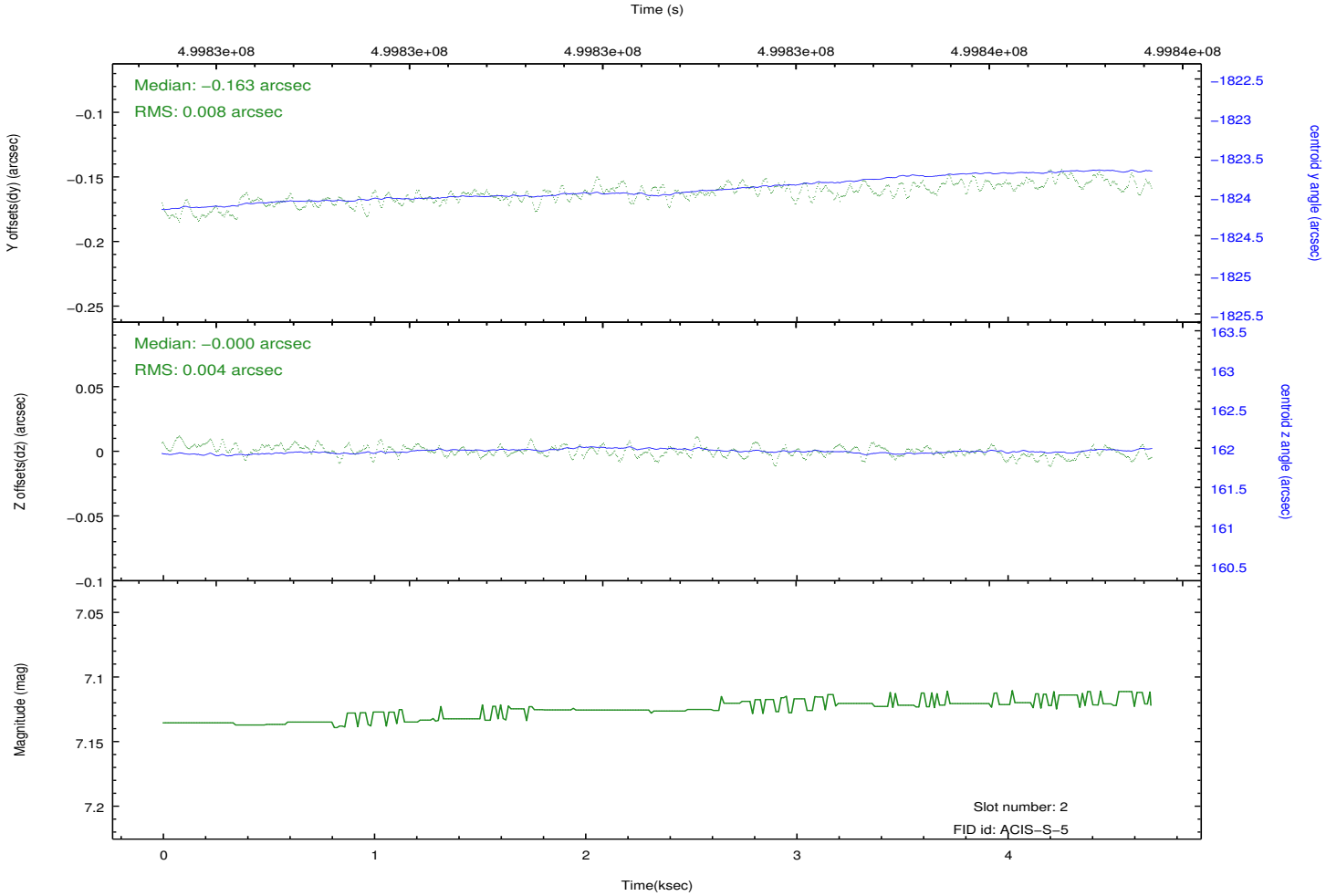

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.228 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.221 arcsec
RMS: 0.007 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.056 arcsec
RMS: 0.002 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: 0.163 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.163 arcsec
RMS: 0.008 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.000 arcsec
RMS: 0.004 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	Jen Lauer
V&V Date (YYYY-MM-DD)	2014.12.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	4.6810000360012

A.2 Comments

```
This is a moving target. Users will need to run sso_freeze or similar
software to position the events in the reference frame of the target.
========
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.
```