V&V Reference Report
L2 ASCDS Version : 8.5.1.1

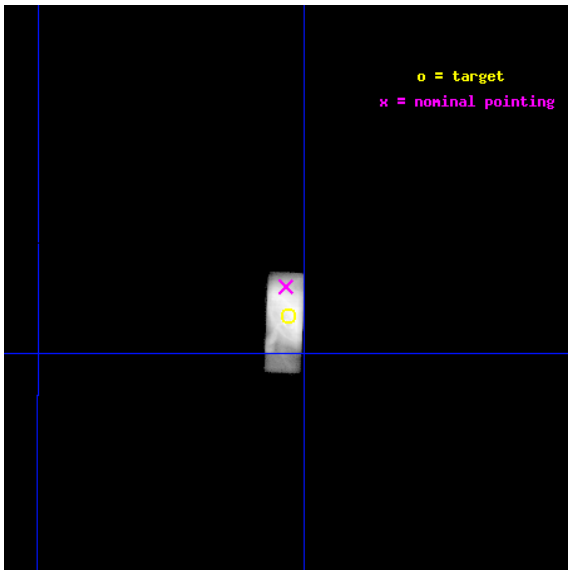
Observation 5556 - L2 Version 5
Chandra X-Ray Center

L2 Processing Date : Mar 7 2013

Contents

1 Front

seq_num	500545	Sequence number
obs_id	5556	Observation id
title	Monitoring of the Relativistic Magnetohydrodynamic Shock in the Crab Nebula	Proposal title
observer	Dr Koji Mori	Principal investigator
object	The Crab Nebula	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.632083	Observer's specified target RA [deg]
dec_targ	22.016472	Observer's specified target Dec [deg]
ra_nom	83.633370717745	Nominal RA [deg]
dec_nom	22.028884443776	Nominal Dec [deg]
roll_nom	92.421624523296	Nominal Roll [deg]
revision	5	Processing version of data
ontime	10156.200403571	Sum of GTIs [s]
livetime	8934.0256892779	Livetime [s]
ontime7	10156.200403571	Sum of GTIs [s]
l2events	2484790	Number of level 2 events

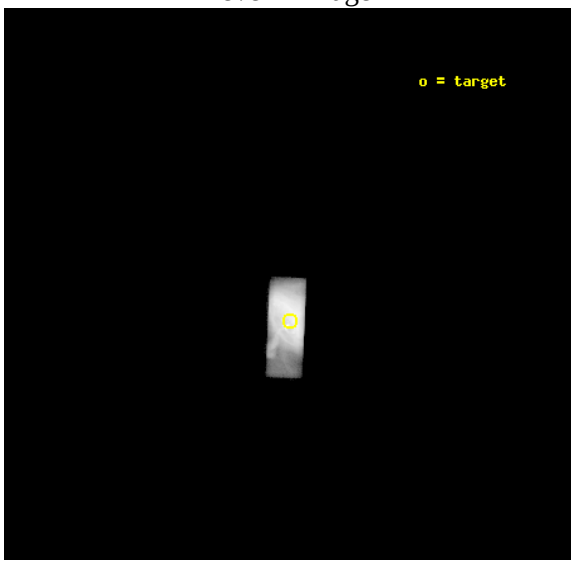


2 OBI

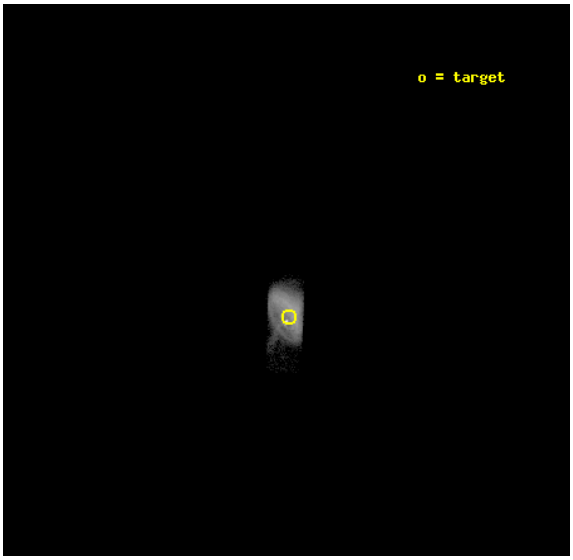
2.1 OBI

2.1.1 Images

Level 1 Image



Level 1 Bad Events



2.1.2 Parameters

obi_num	0	Obi number
ascdsver	8.5.1.1	Processing system revision
caldbver	4.5.6	
date	2013-03-07T12:54:23	Date and time of file creation
revision	5	Processing version of data

sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ontime	10156.200403571	Sum of GTIs [s]
ontime7	10156.200403571	Sum of GTIs [s]
l1events	2649810	Number of level 1 events

2.1.3 Events

	ccd 7
level 1 events	2649810
rejected events	125668
rejected %	4%

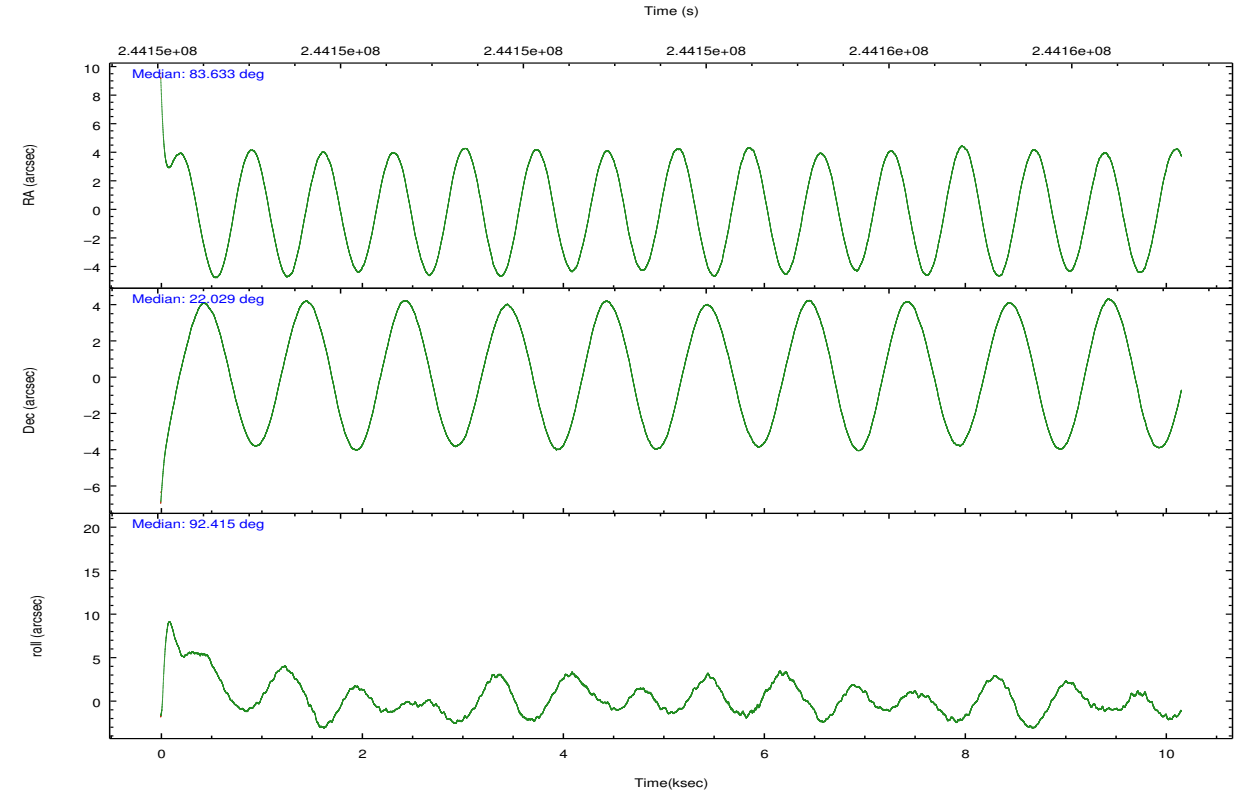
	ccd 7
grade 0 events	509230
	19%
grade 1 events	9600
	0%
grade 2 events	648668
	24%
grade 3 events	288975
	10%
grade 4 events	278517
	10%
grade 5 events	40328
	1%
grade 6 events	826882
	31%
grade 7 events	47610
	1%

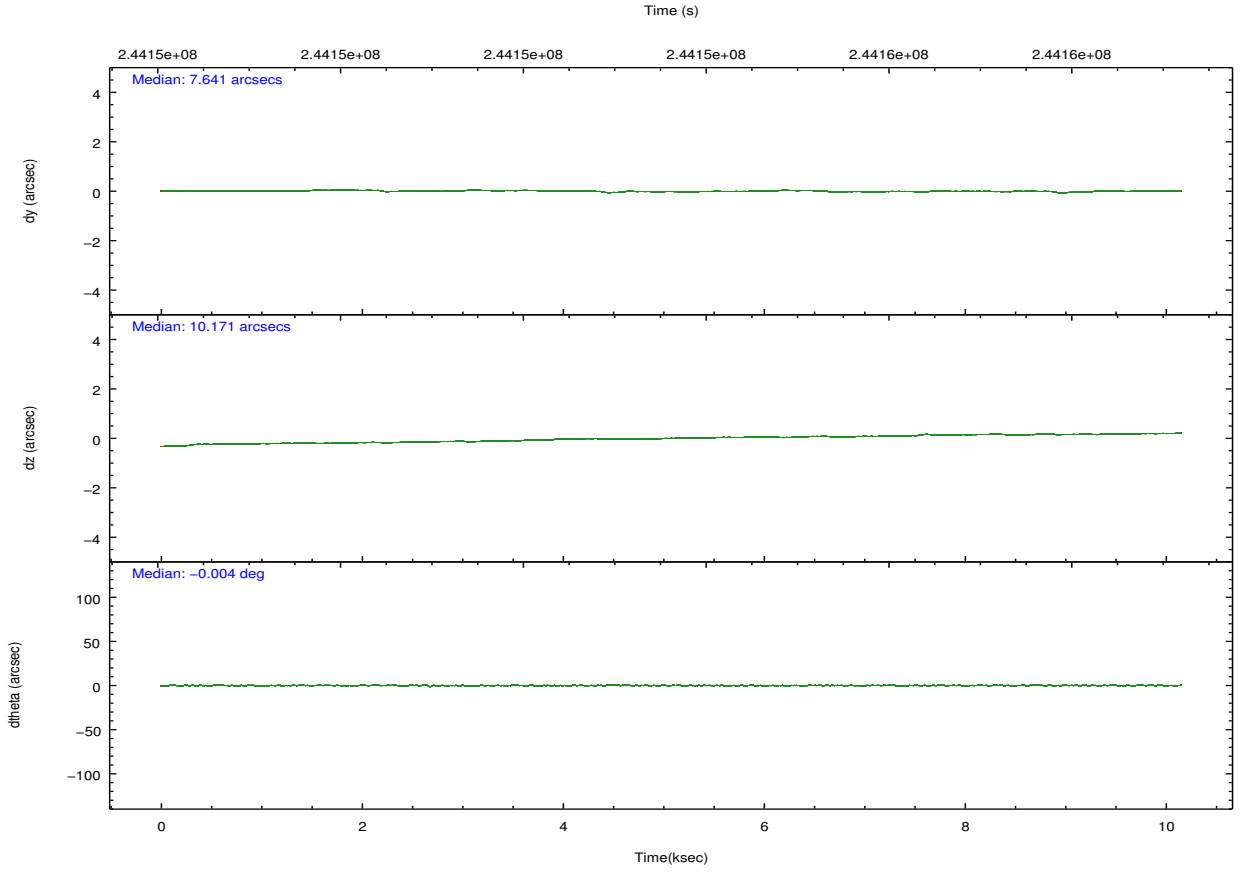
2.2 Compared Parameters

Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-7	ACIS-7
Grating	HETG	HETG
Data mode	GRADED	GRADED
Observation mode	POINTING	POINTING
[deg] Pointing RA	83.649435	83.63337071774504
[deg] Pointing Dec	22.006106	22.0288844437759
[deg] Pointing Roll	92.258989	92.42162452329643
[s] Window start time (MET)	244080064.184000	244080064.184000
[s] Window stop time (MET)	244684864.184000	244684864.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-182.132523	-182.139514760308
[mm] SIM translation stage offset	-8	-7.993007822699838
[s] Observation start time (MET)	244148695.184000	244147716.21973
Observation start date	2005-09-26T19:03:51	2005-09-26T18:48:36
[s] Observation end time (MET)	244158695.184000	244160320.64531
Observation end date	2005-09-26T21:50:31	2005-09-26T22:18:40
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	CUSTOM	CUSTOM
Subarray start row	127	127
Subarray row count	101	101
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	0.3

2.3 Aspect


Time (s)
2.4415e+08
2.4415e+08
2.4415e+08
2.4415e+08
2.4416e+08
2.4416e+08
Median: 83.633 deg
RA (arcsec)
Median: 22.029 deg
Dec (arcsec)
Median: 92.415 deg
roll (arcsec)
Time(ksec)

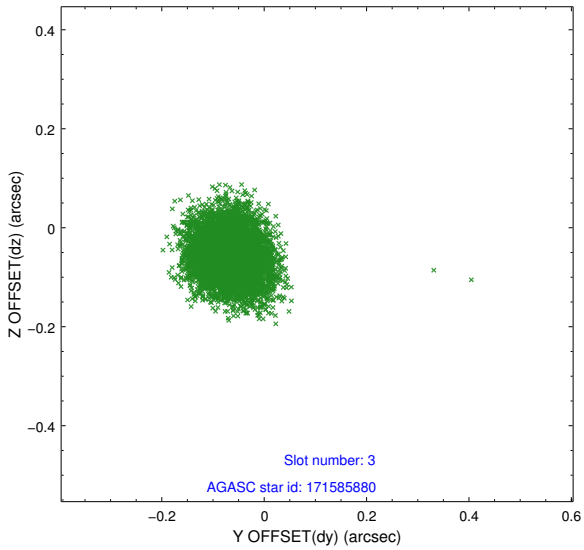

Time (s)
2.4415e+08
2.4415e+08
2.4415e+08
2.4415e+08
2.4416e+08
2.4416e+08
Median: 7.641 arcsecs
dy (arcsec)
Median: 10.171 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

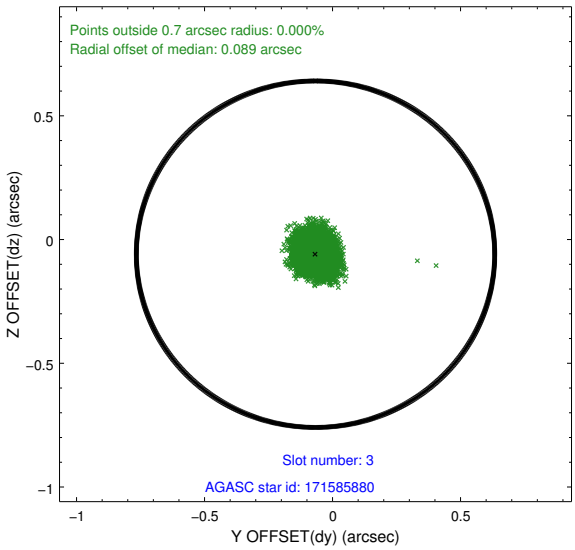
Slot Statistics

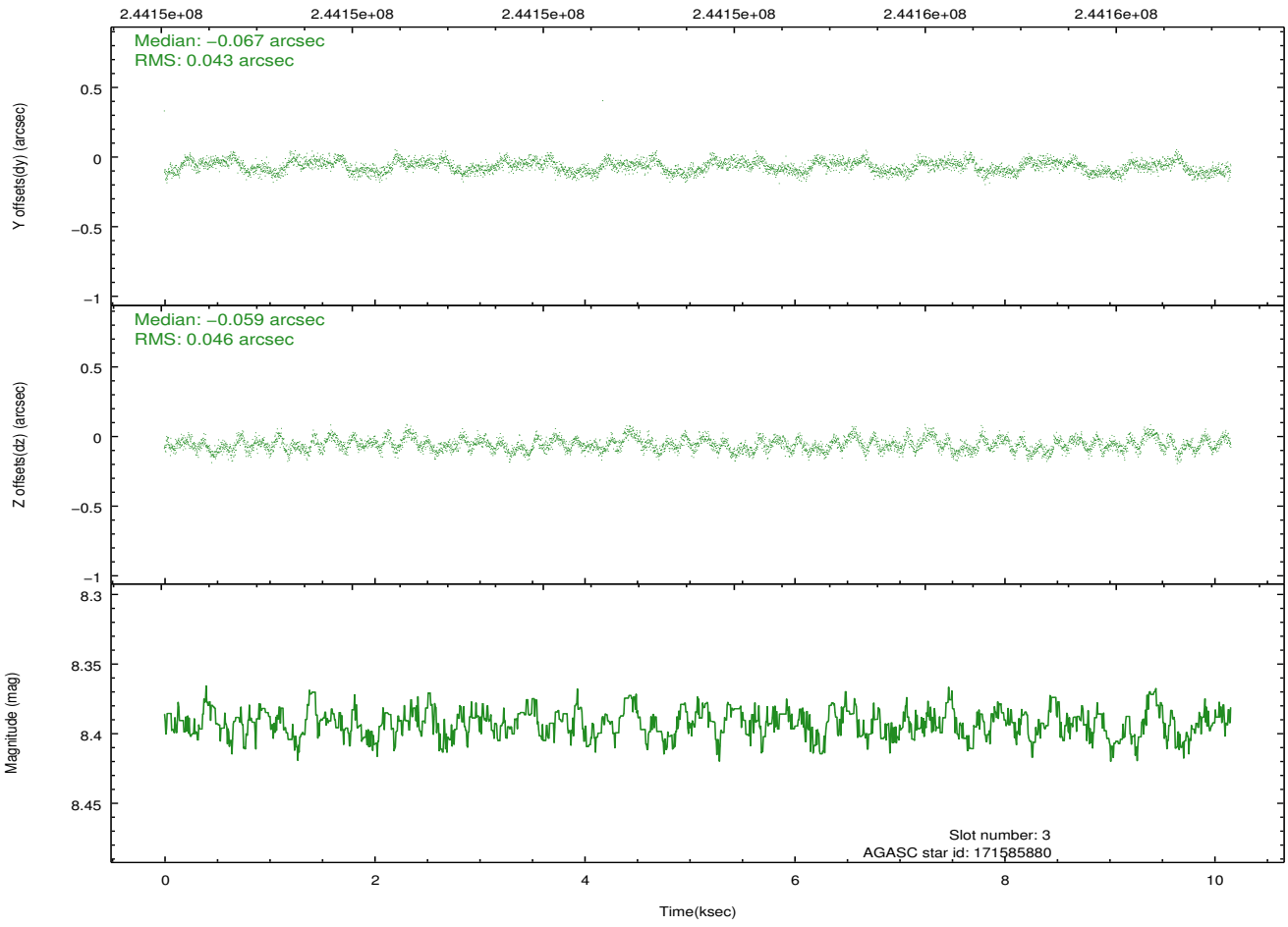
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	2478	-0.071	-0.094	0.007	0.012	0.000000	0.000000	-759.90	-1896.16
1	FID	ACIS-S-4	7.19	2478	0.115	0.059	0.005	0.010	0.000000	0.000000	2153.32	11.87
2	FID	ACIS-S-5	7.23	2478	-0.075	0.042	0.006	0.011	0.000000	0.000000	-1812.08	6.09
3	GUIDE	171585880	8.39	4952	-0.067	-0.059	0.067	0.104	83.676260	22.176319	609.05	-113.35
4	GUIDE	171586032	8.94	4953	-0.082	0.181	0.069	0.111	83.950197	22.083225	239.35	-1013.19
5	GUIDE	171721904	9.19	4955	-0.045	0.074	0.107	0.158	84.272676	22.116922	321.53	-2092.80
6	GUIDE	243941560	8.30	4956	-0.127	0.063	0.058	0.094	83.733264	22.568598	2012.71	-358.20
7	GUIDE	171597832	9.14	4949	0.317	-0.262	0.074	0.121	83.183230	21.366702	-2235.28	1652.04

2.4 Star Slots

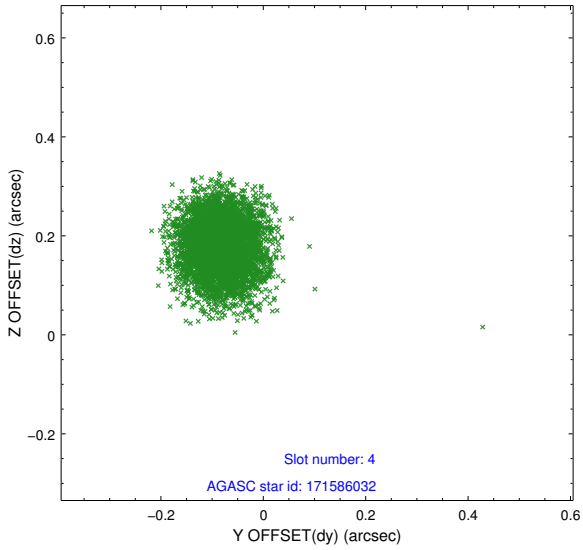
2.4.1 Slot 3

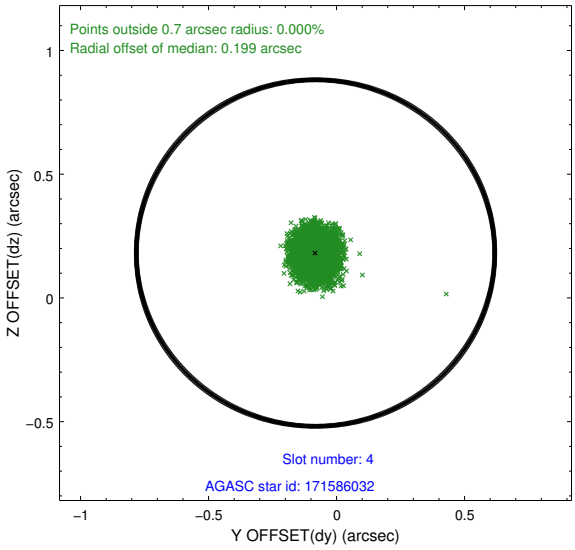


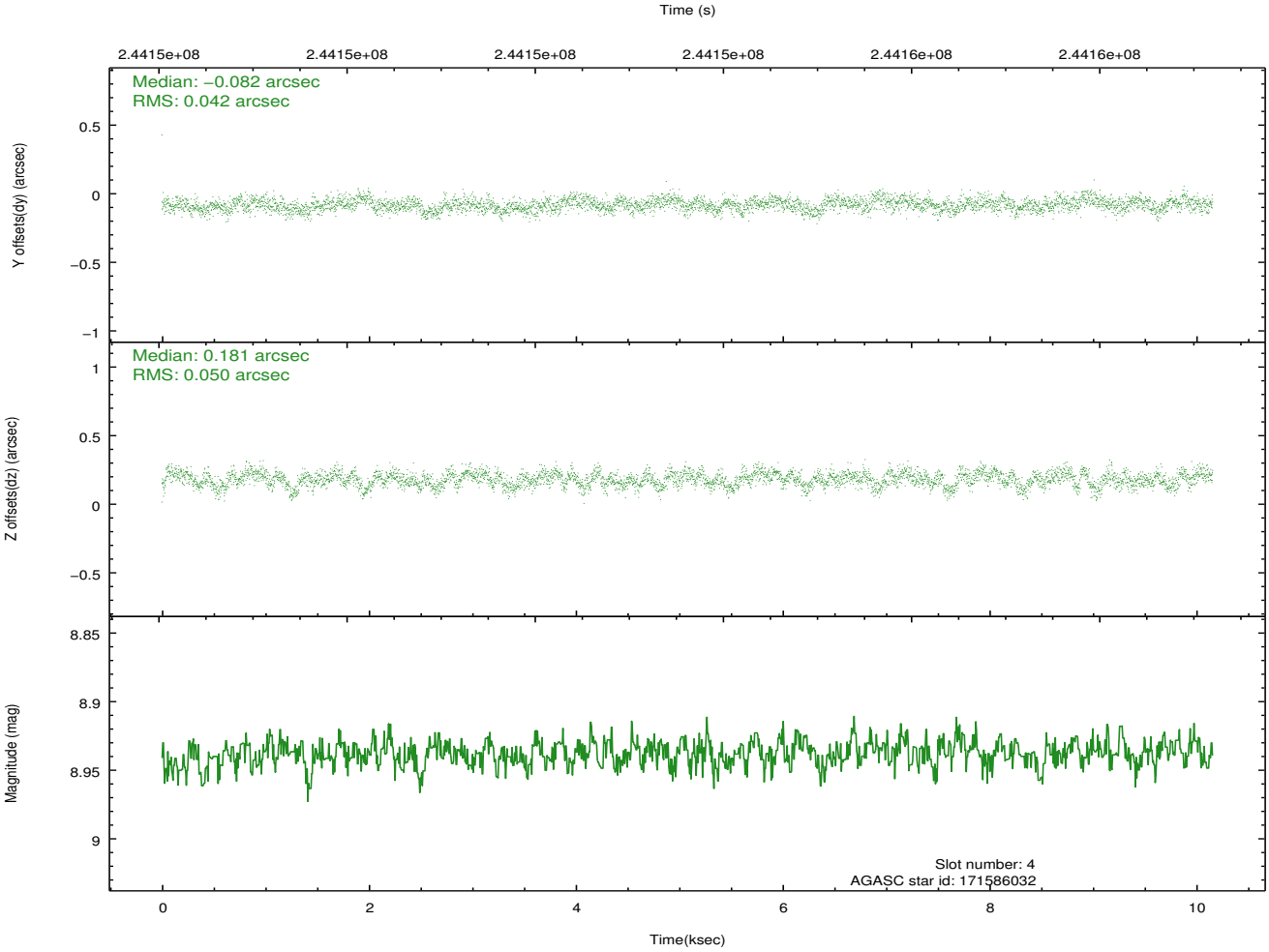




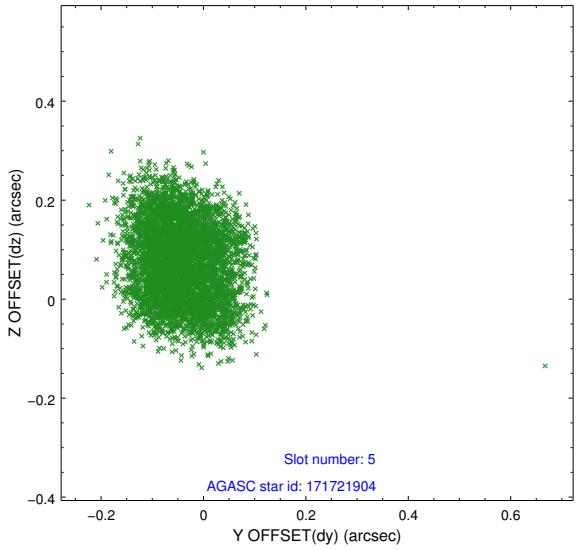
2.4.2 Slot 4

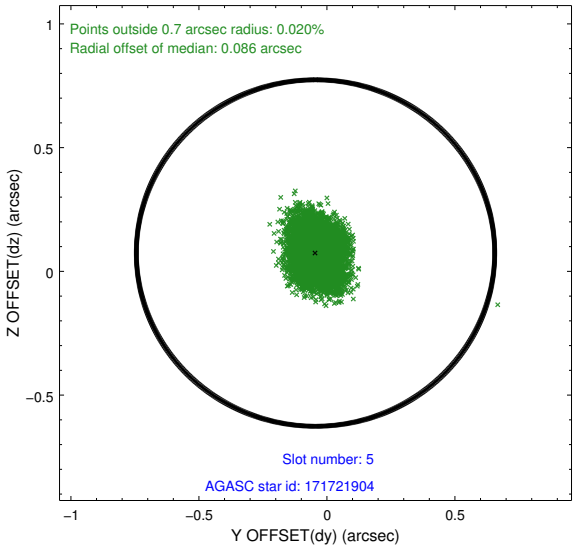

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032

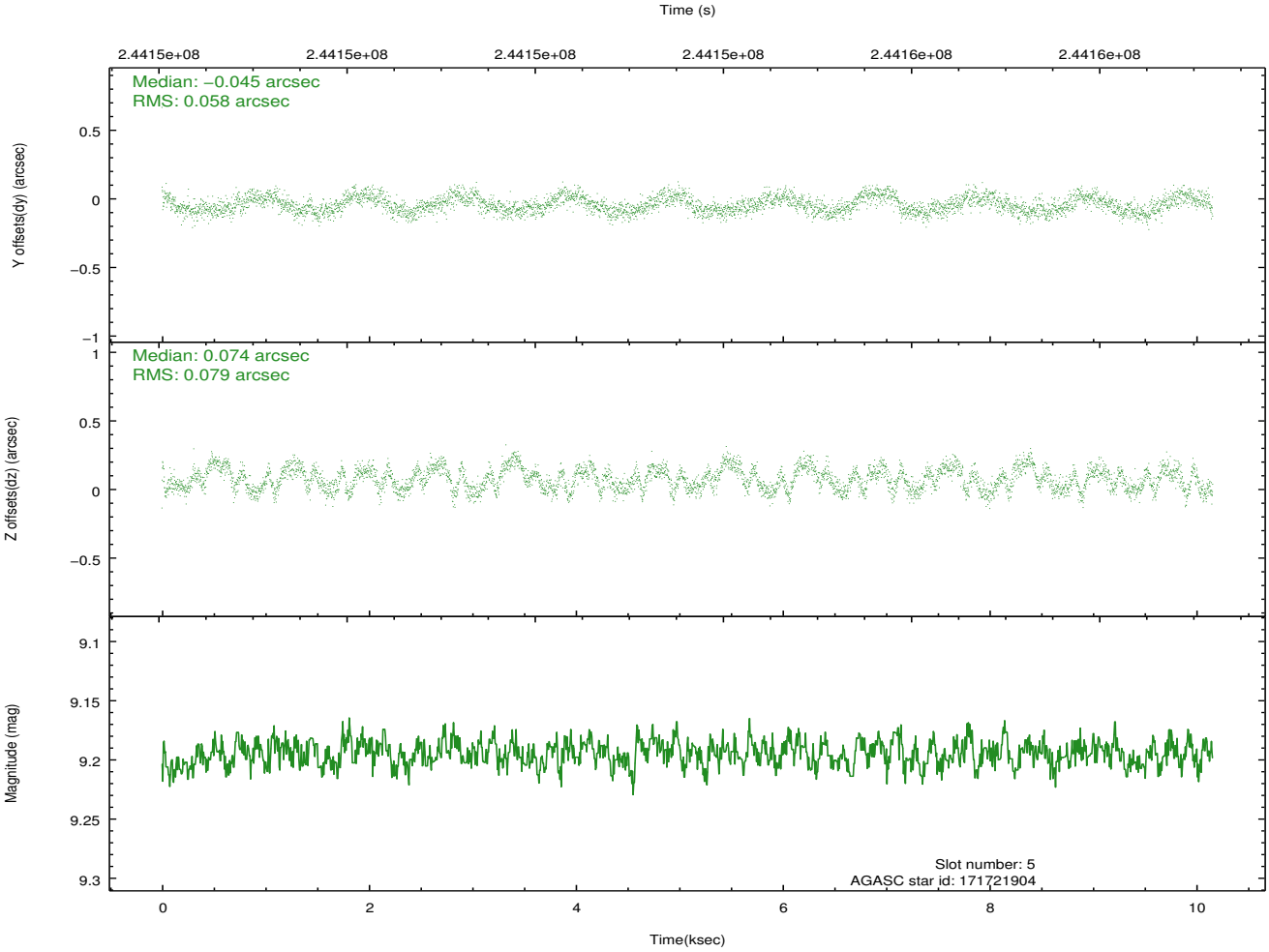

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.199 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032


Time (s)
Median: −0.082 arcsec
RMS: 0.042 arcsec
Y offsets(dy) (arcsec)
Median: 0.181 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 171586032
Time(ksec)

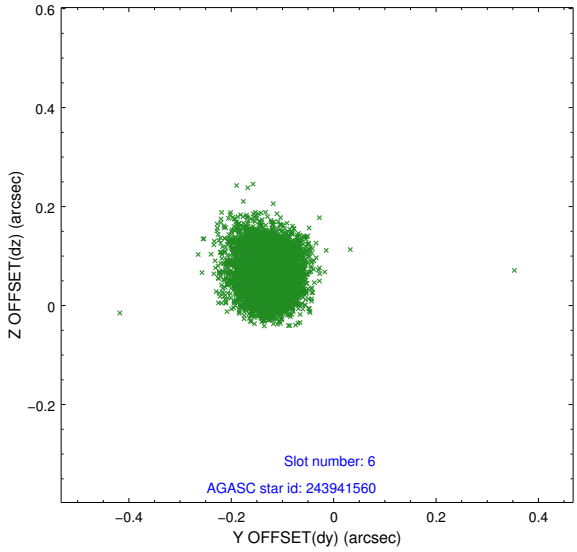
2.4.3 Slot 5

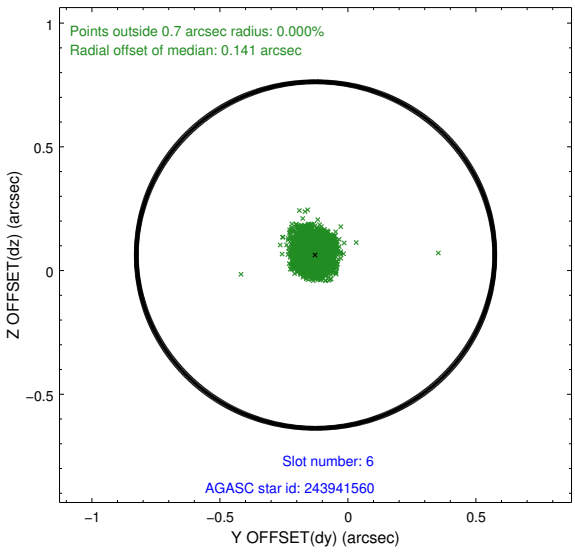

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171721904

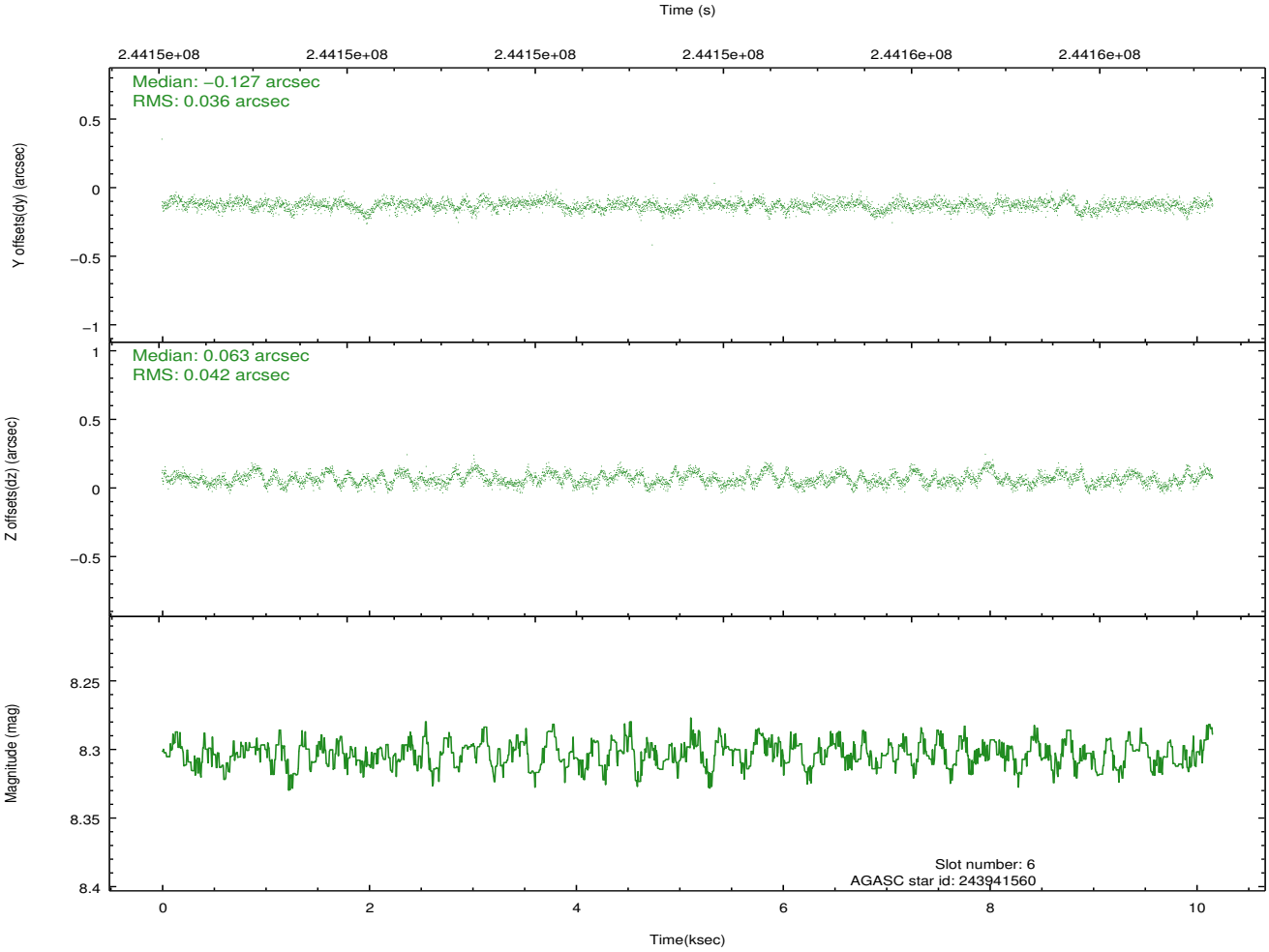

Points outside 0.7 arcsec radius: 0.020%
Radial offset of median: 0.086 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171721904


Time (s)
Median: −0.045 arcsec
RMS: 0.058 arcsec
Y offsets(dy) (arcsec)
Median: 0.074 arcsec
RMS: 0.079 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 171721904
Time(ksec)

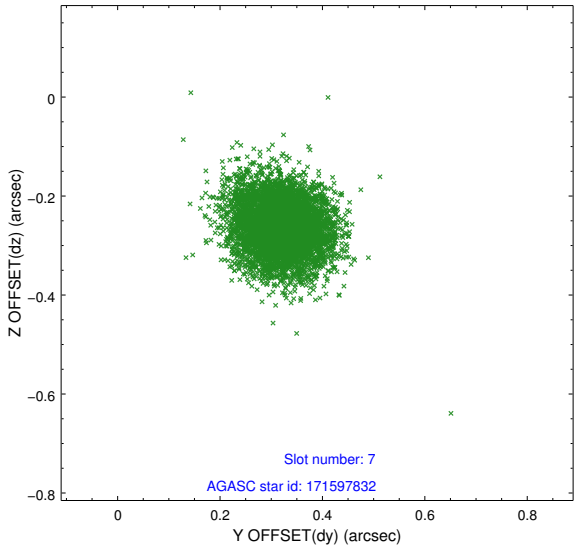
2.4.4 Slot 6

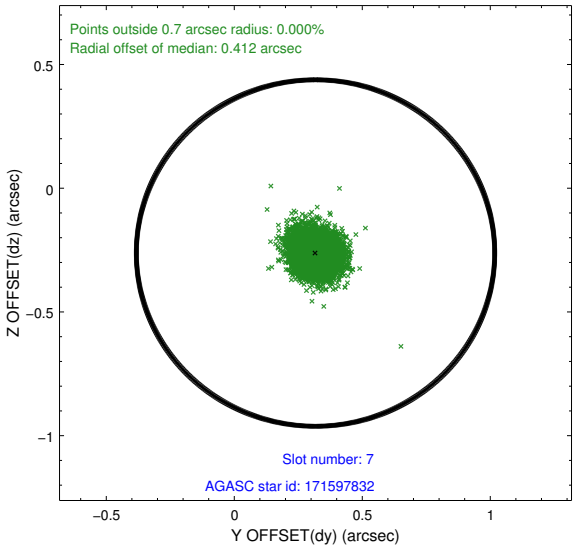

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 243941560

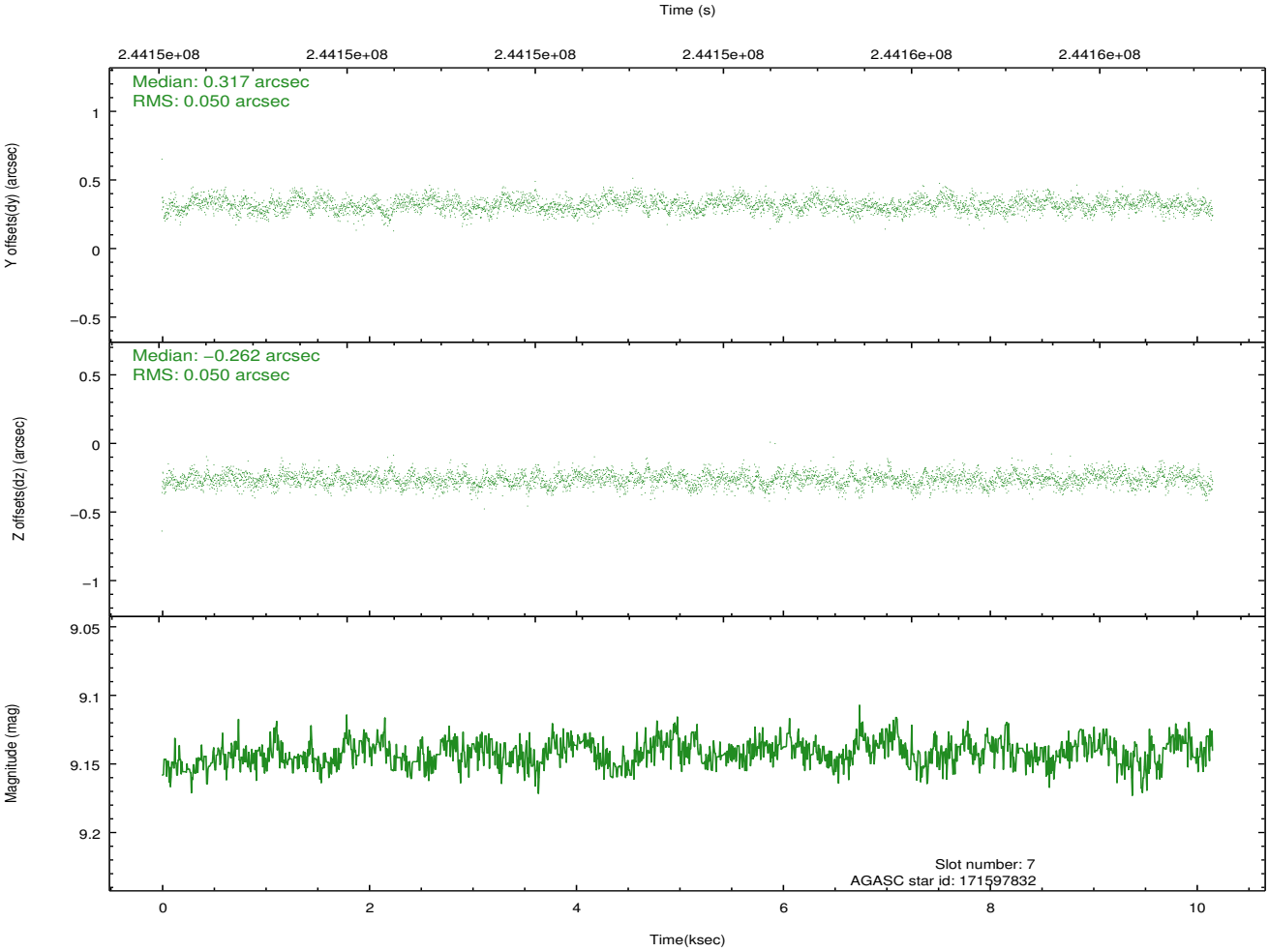

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.141 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 243941560


Time (s)
Median: −0.127 arcsec
RMS: 0.036 arcsec
Y offsets(dy) (arcsec)
Median: 0.063 arcsec
RMS: 0.042 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 243941560
Time(ksec)

2.4.5 Slot 7

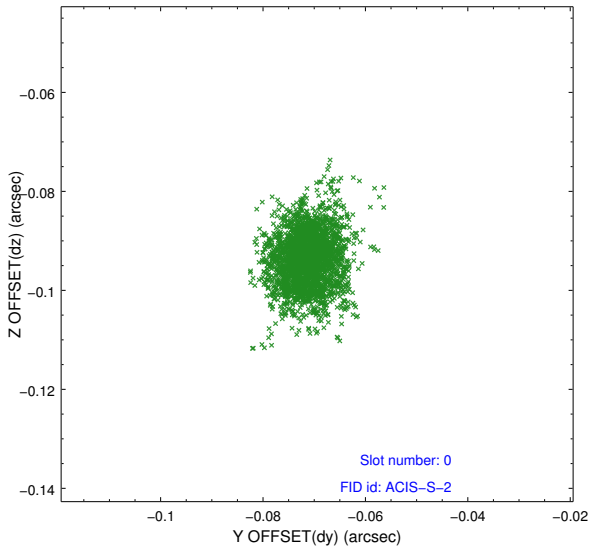

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 171597832

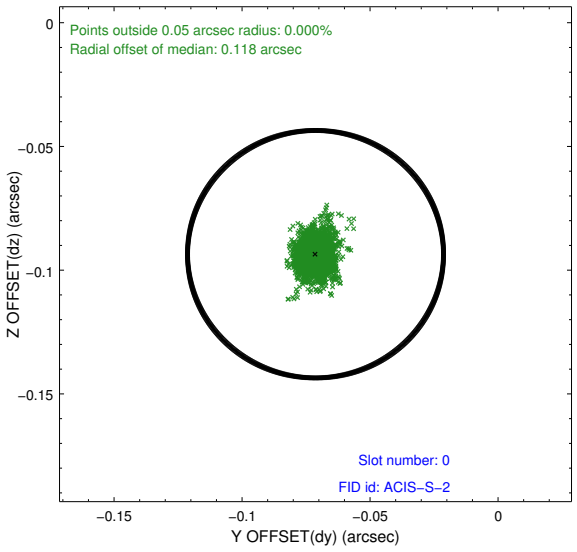

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.412 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 171597832

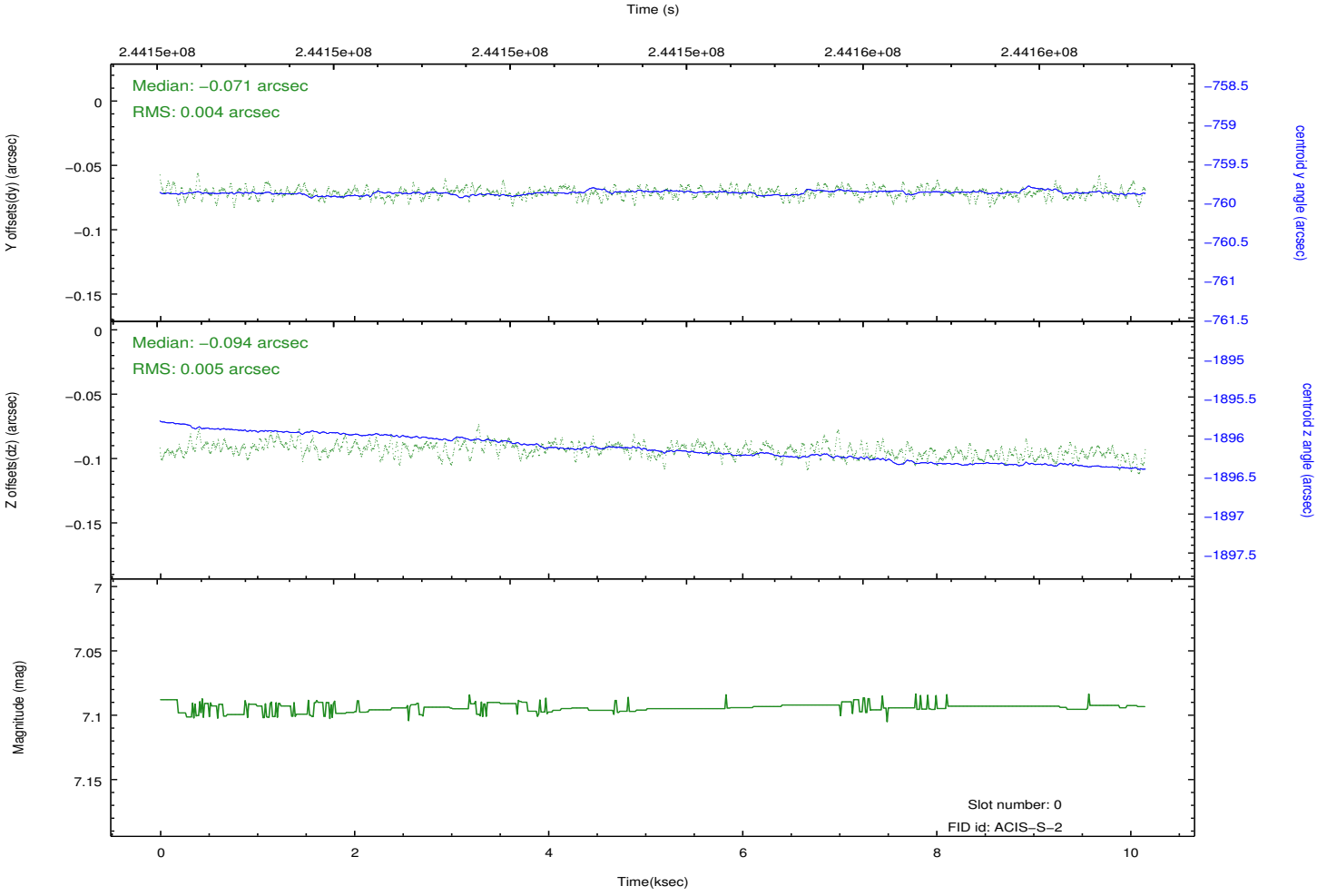

Time (s)
Median: 0.317 arcsec
RMS: 0.050 arcsec
Y offsets(dy) (arcsec)
Median: −0.262 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 171597832
Time(ksec)

2.5 FID Slots

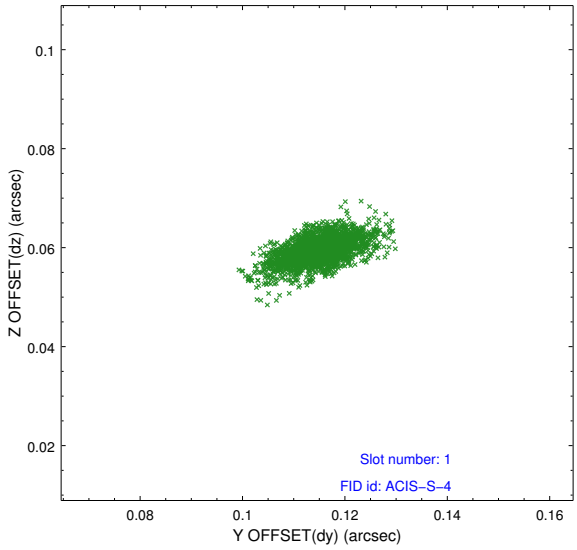
2.5.1 Slot 0

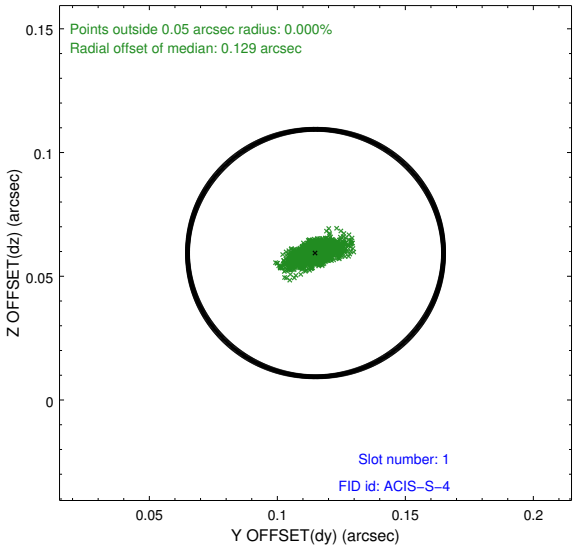


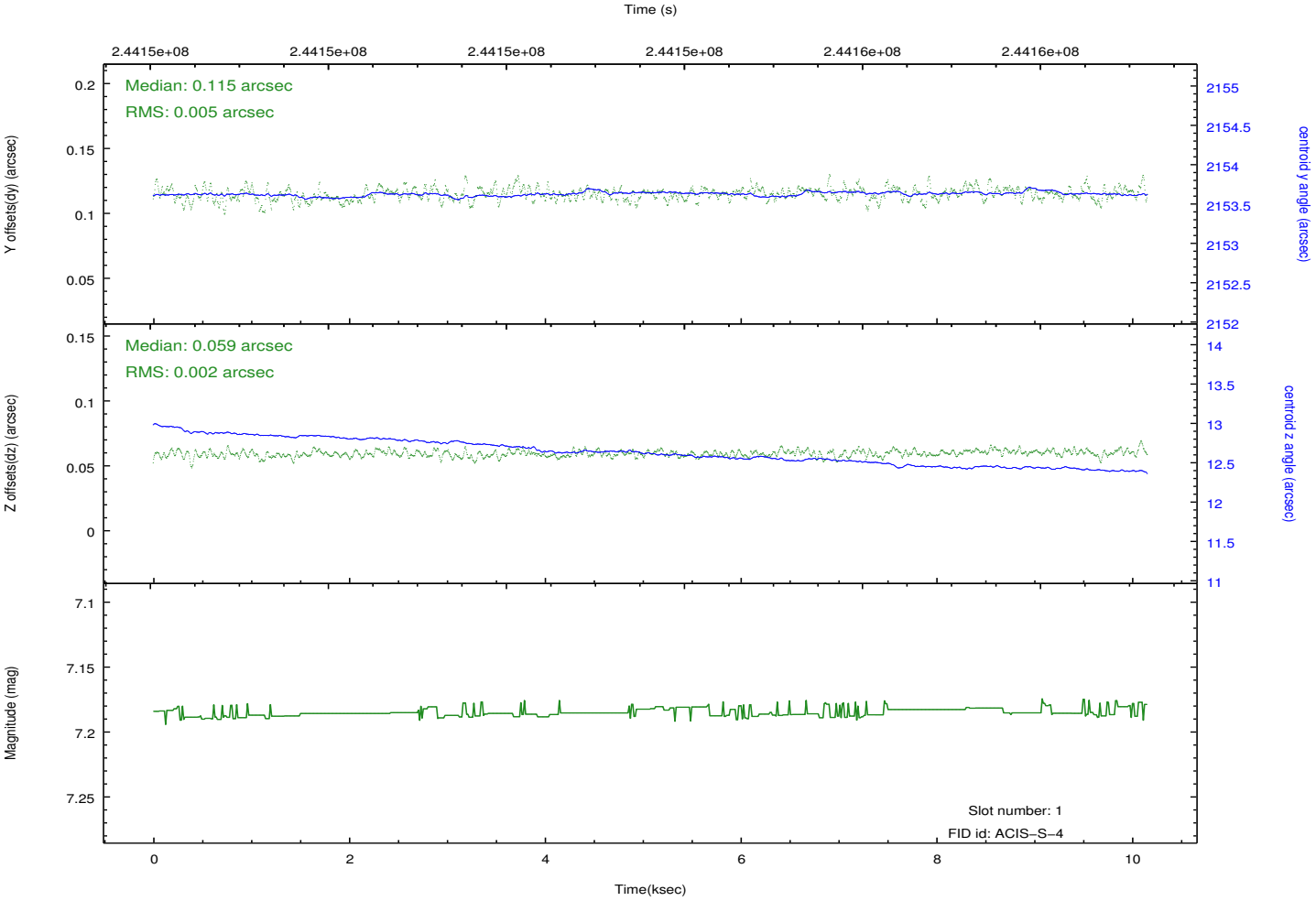




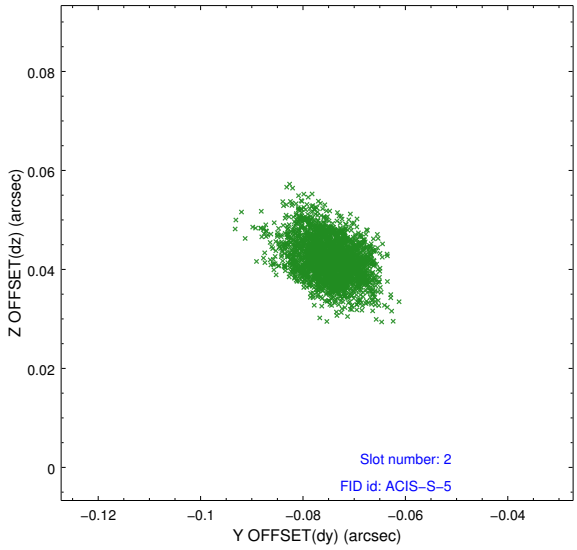
2.5.2 Slot 1

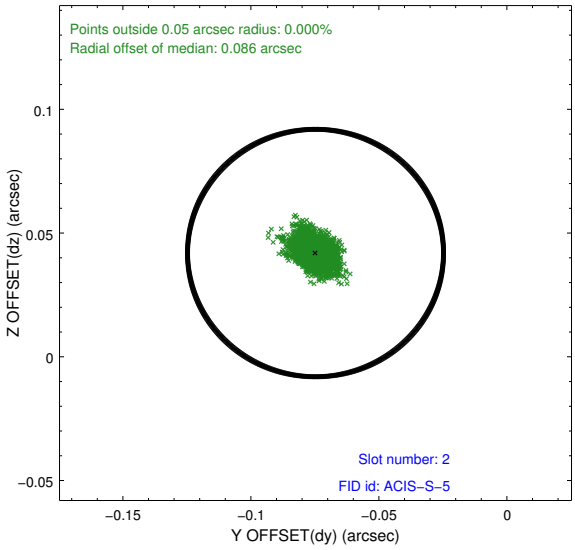

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

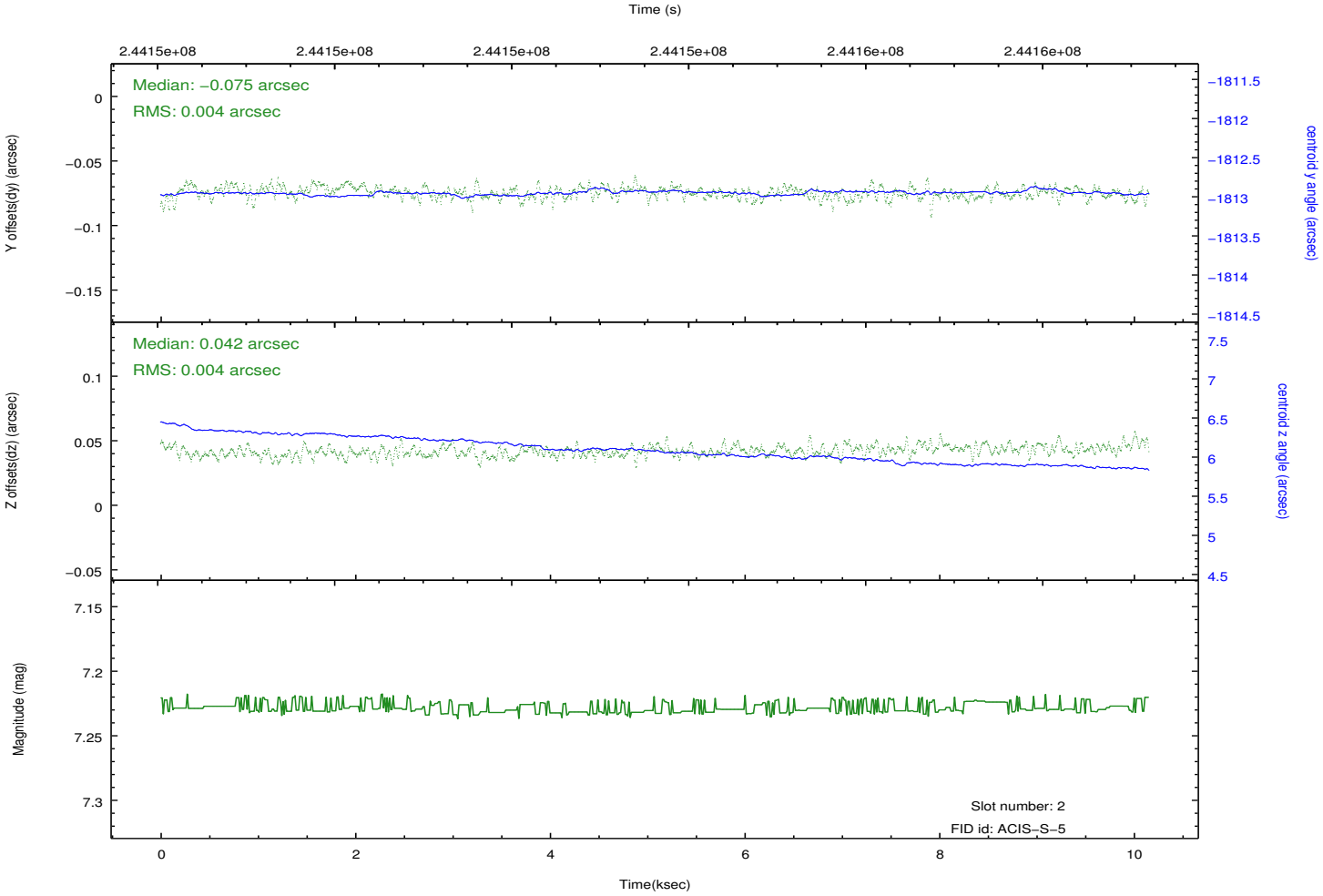

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.129 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.115 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.059 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

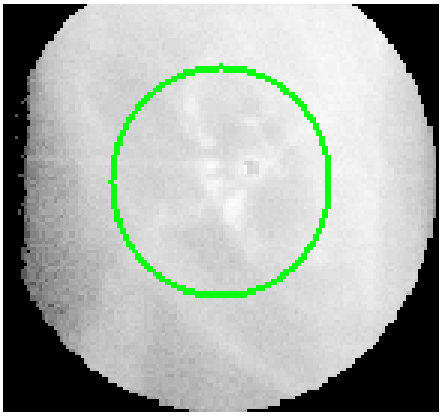

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.086 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.075 arcsec
RMS: 0.004 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.042 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)

3 Gratings

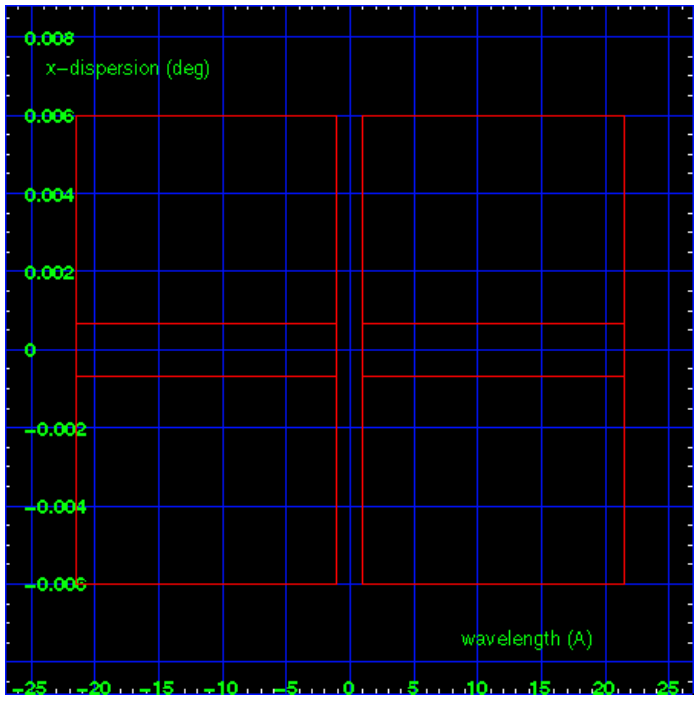
3.1 HEG Arm

HEG Order Sort 123

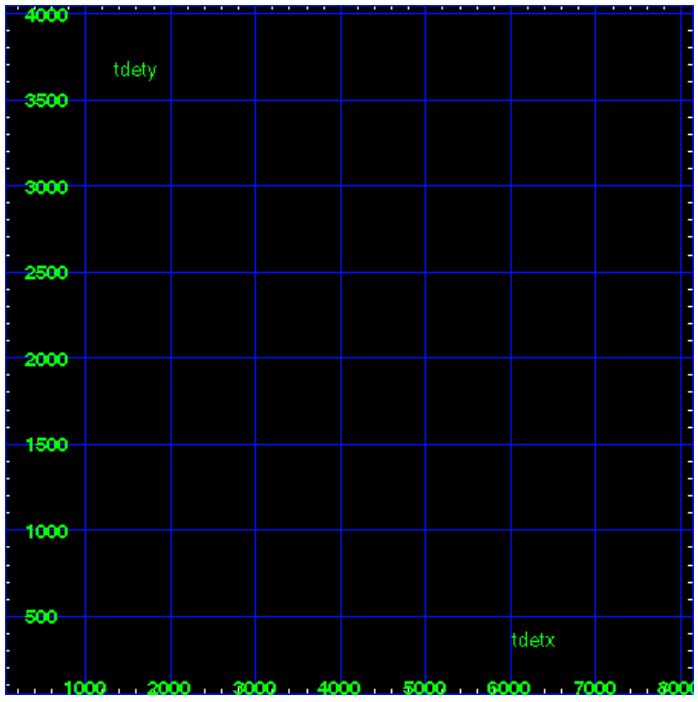


HEG Zero Order

HEG Order Sort ALL

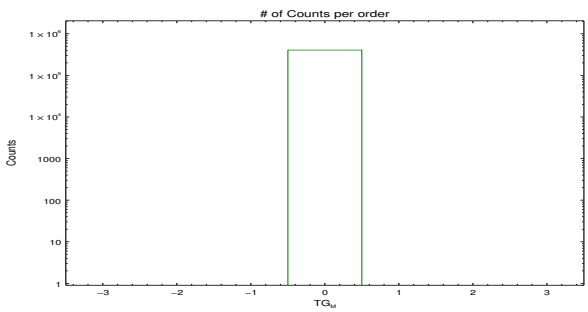


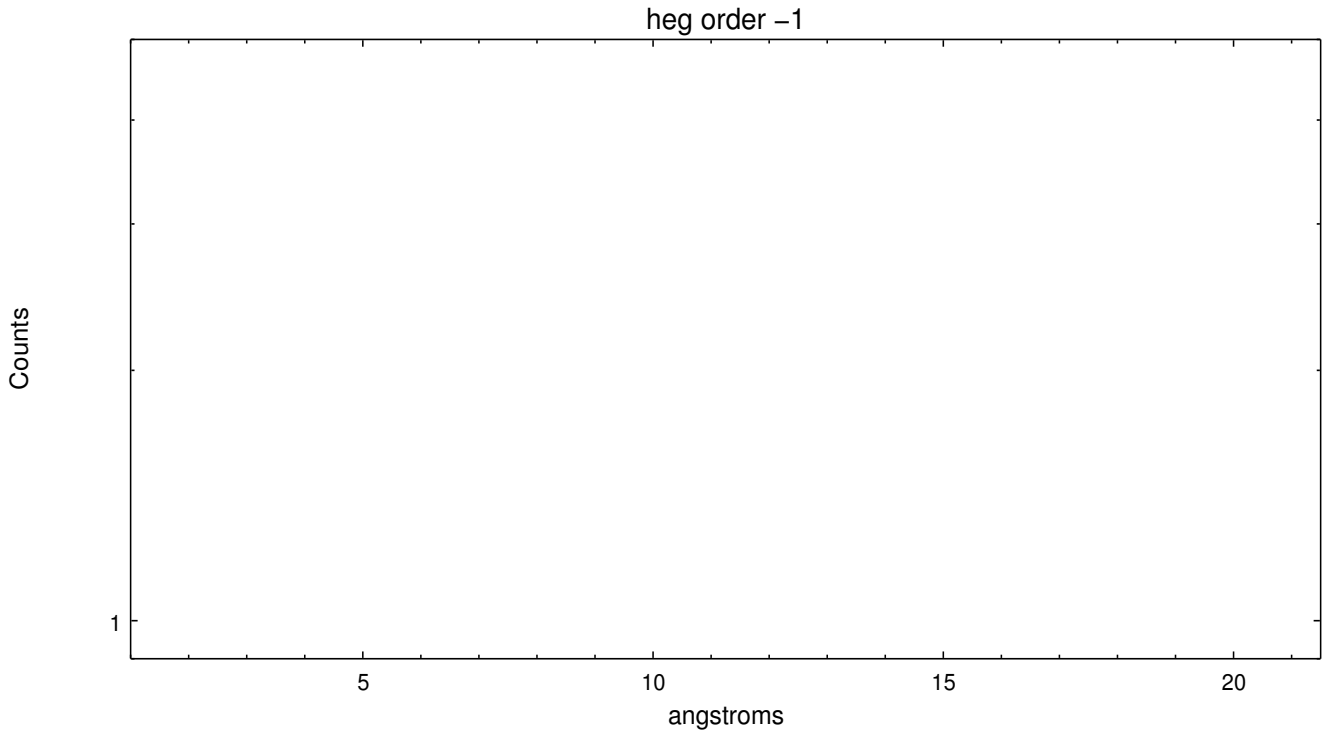
Spot Image HEG

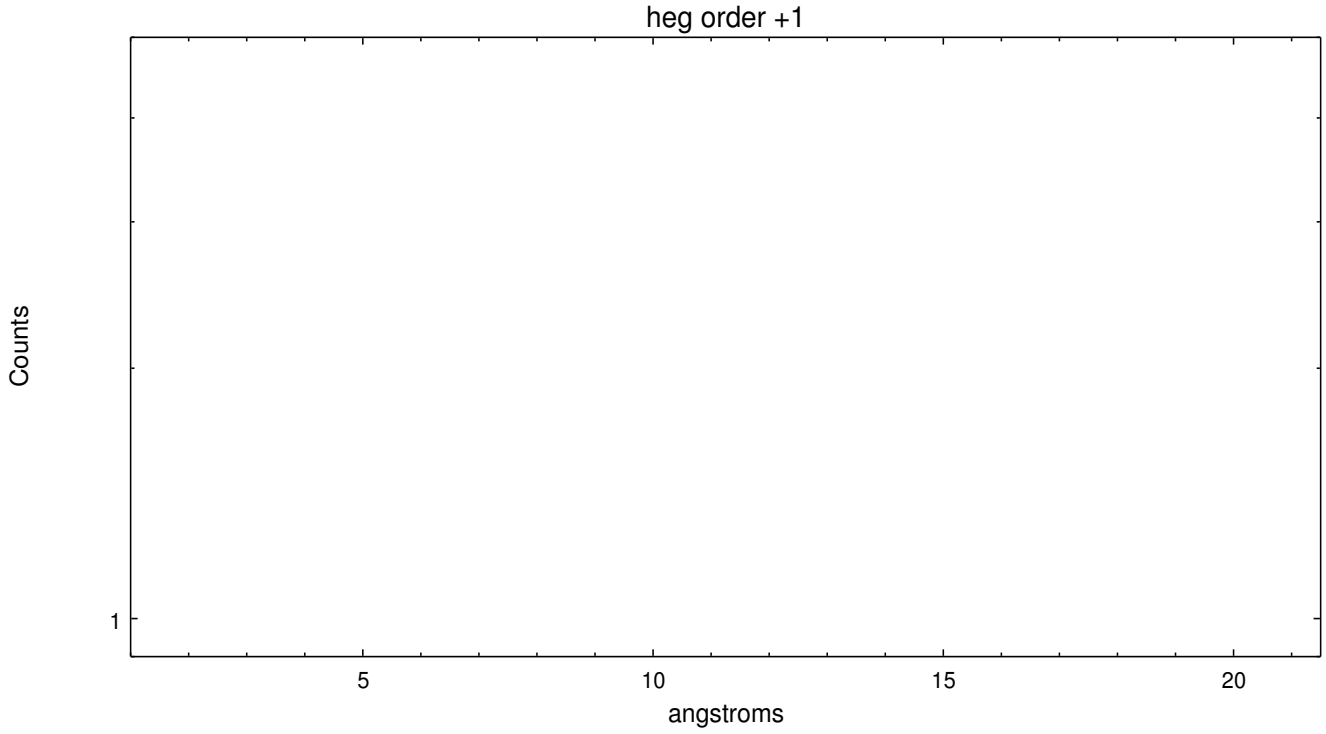


Full Detector HEG

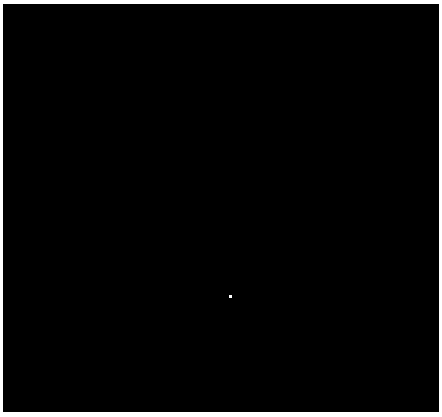
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	0	409503	0	0	0



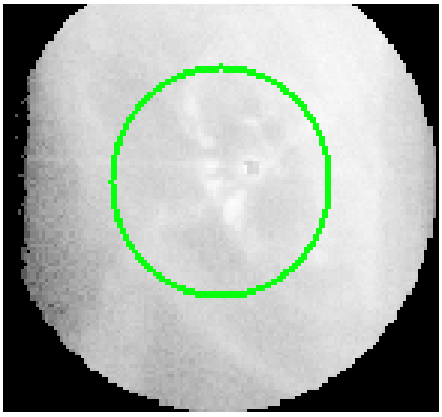

heg order −1
Counts
1
5
10
15
20
angstroms


heg order +1
Counts
1
5
10
15
20
angstroms

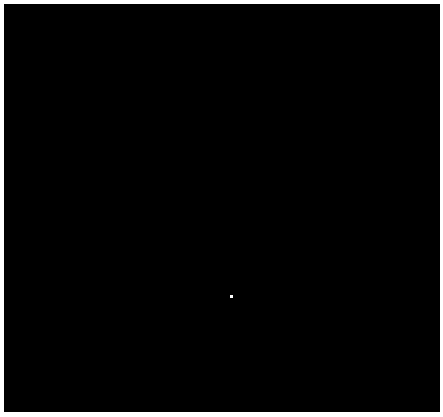
3.2 MEG Arm



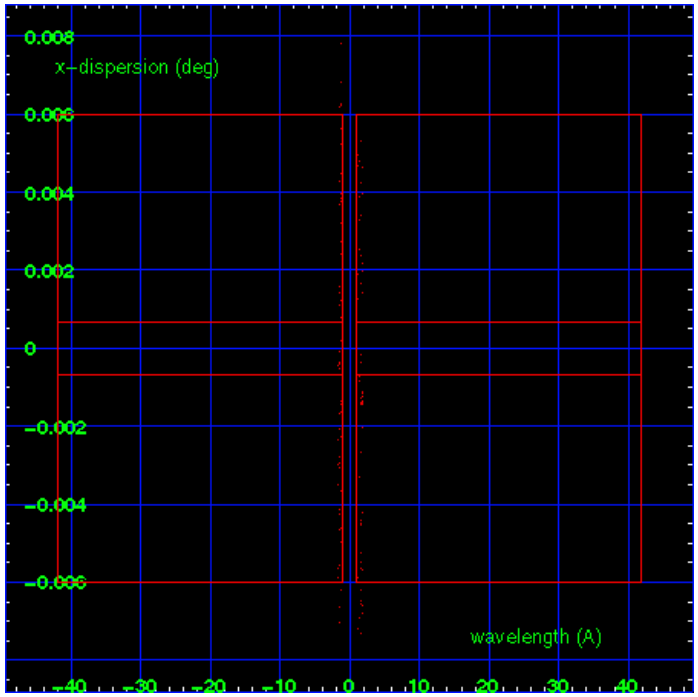
MEG Order Sort 123



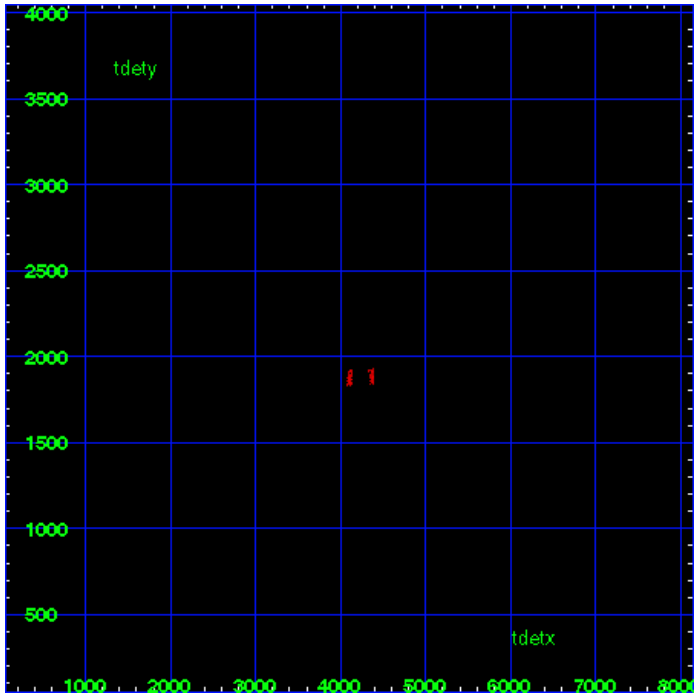
MEG Zero Order



MEG Order Sort ALL

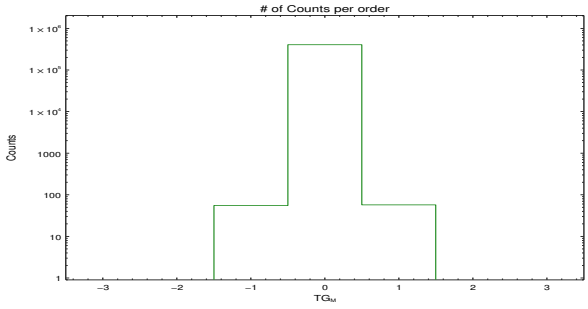


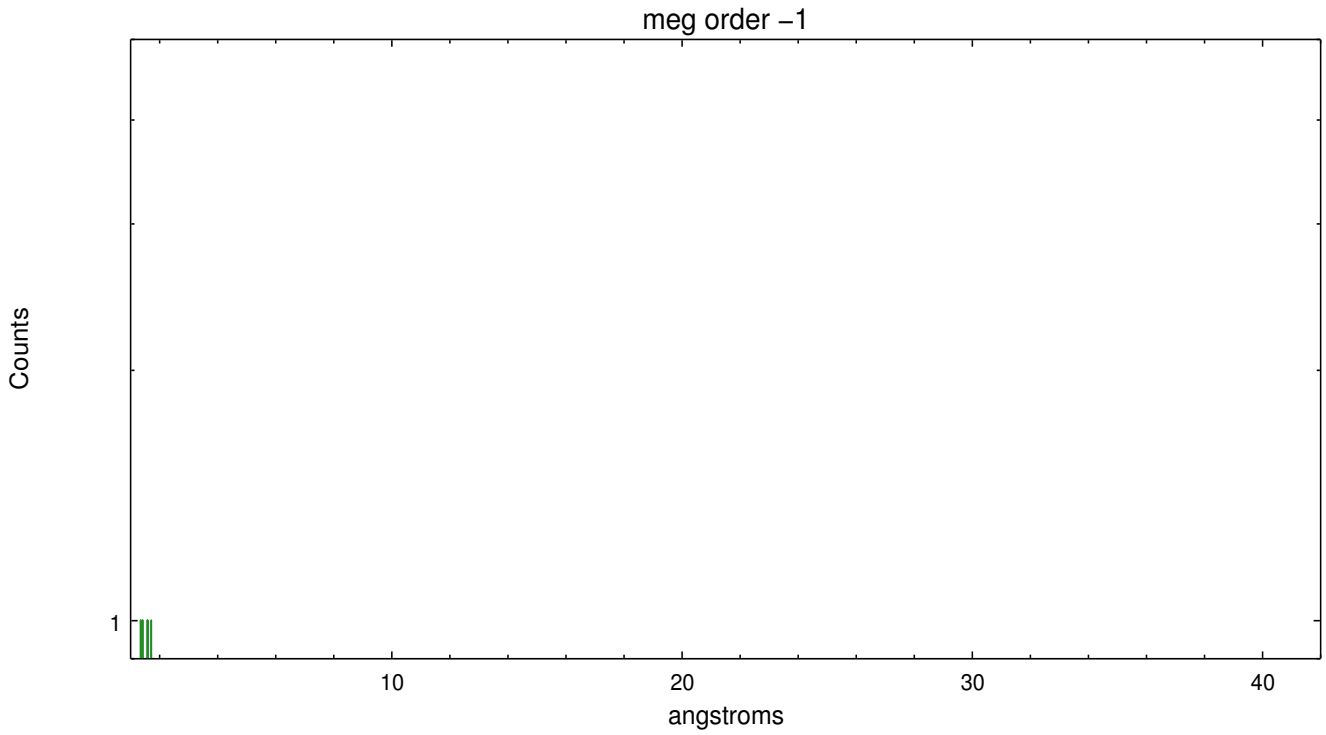
Spot Image MEG

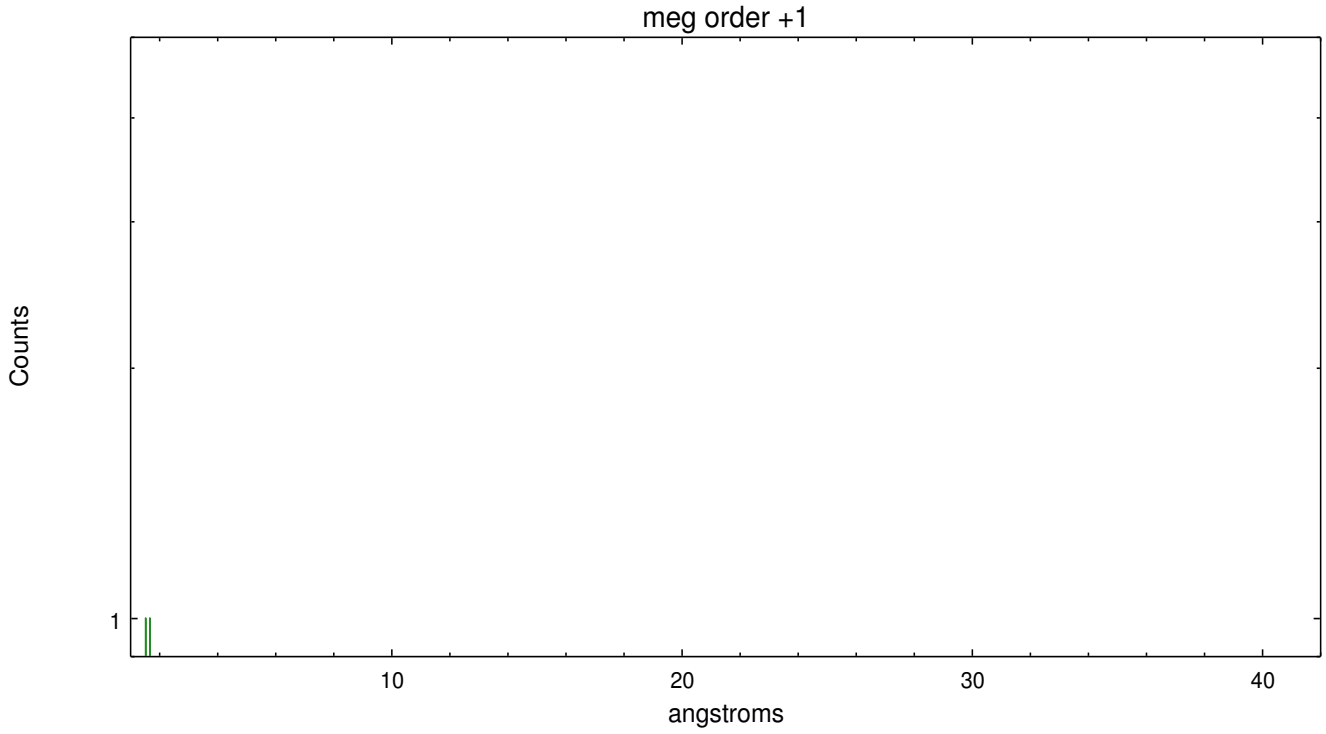


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	55	409503	57	0	0




meg order −1
Counts
1
10
20
30
40
angstroms


meg order +1
Counts
1
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2013.03.13
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	10.1562

A.2 Comments

Window preference met. HETG is inserted as a filter; there is very little useful gratings information in the observation. The zeroth order position used in the grating extraction is NOT at the position of the pulsar, but is near a bright emission knot to the SE. If the dispersed grating spectrum is to be analyzed, it should be re-extracted using the exact position of the pulsar as the zeroth order position. The dispersed spectrum only contains data for the meg +1 order between 1-2 A. Broad east/west streak in Level 2 data is instrumental, due to the fact that the spacecraft dither during this observation was only 1 arcsec.
===
As a consequence of the DEA-A shutdown anomaly on Sep 15th (DOY258), the reported value of the ACIS FP temperature was ~1.3 degrees warmer than the actual temperature. The value for FP temperature reported in the headers of the Level 2 event file and the Mission Timeline files are incorrect by this amount for this processing. However, the temperature is corrected in the processing in order to obtain the correct temperature for the CTI correction. So the calibrated data are correct. If using the FP temp values in the headers of data files (some CIAO tools require this information), investigators should subtract 1.3 degrees from the reported temperature to determine the true temperature.