V&V Reference Report
L2 ASCDS Version : 8.5.1.1

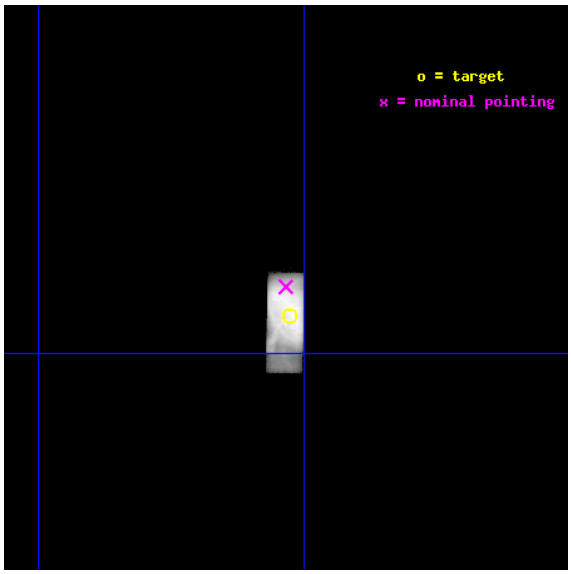
Observation 5558 - L2 Version 4
Chandra X-Ray Center

L2 Processing Date : Dec 31 2012

Contents

1 Front

seq_num	500547	Sequence number
obs_id	5558	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	83.633679571267	Nominal RA [deg]
dec_nom	22.028873616743	Nominal Dec [deg]
roll_nom	91.044915973505	Nominal Roll [deg]
revision	4	Processing version of data
ontime	10173.600404263	Sum of GTIs [s]
livetime	8949.3318123351	Livetime [s]
ontime7	10173.600404263	Sum of GTIs [s]
l2events	2482694	Number of level 2 events

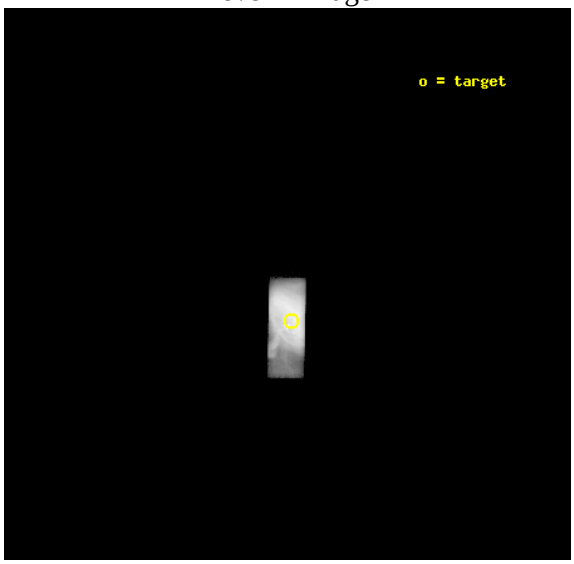


2 OBI

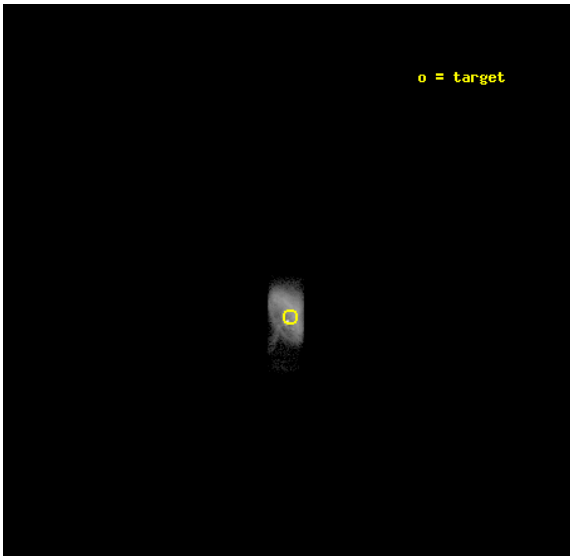
2.1 OBI

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	4.5.5	
date	2012-12-31T11:23:59	Date and time of file creation
revision	4	Processing version of data

sched_exp_time	10000.000000	[s] Scheduled observation exposure time
ontime	10173.600404263	Sum of GTIs [s]
ontime7	10173.600404263	Sum of GTIs [s]
l1events	2648392	Number of level 1 events

2.1.3 Events

	ccd 7
level 1 events	2648392
rejected events	126887
rejected %	4%

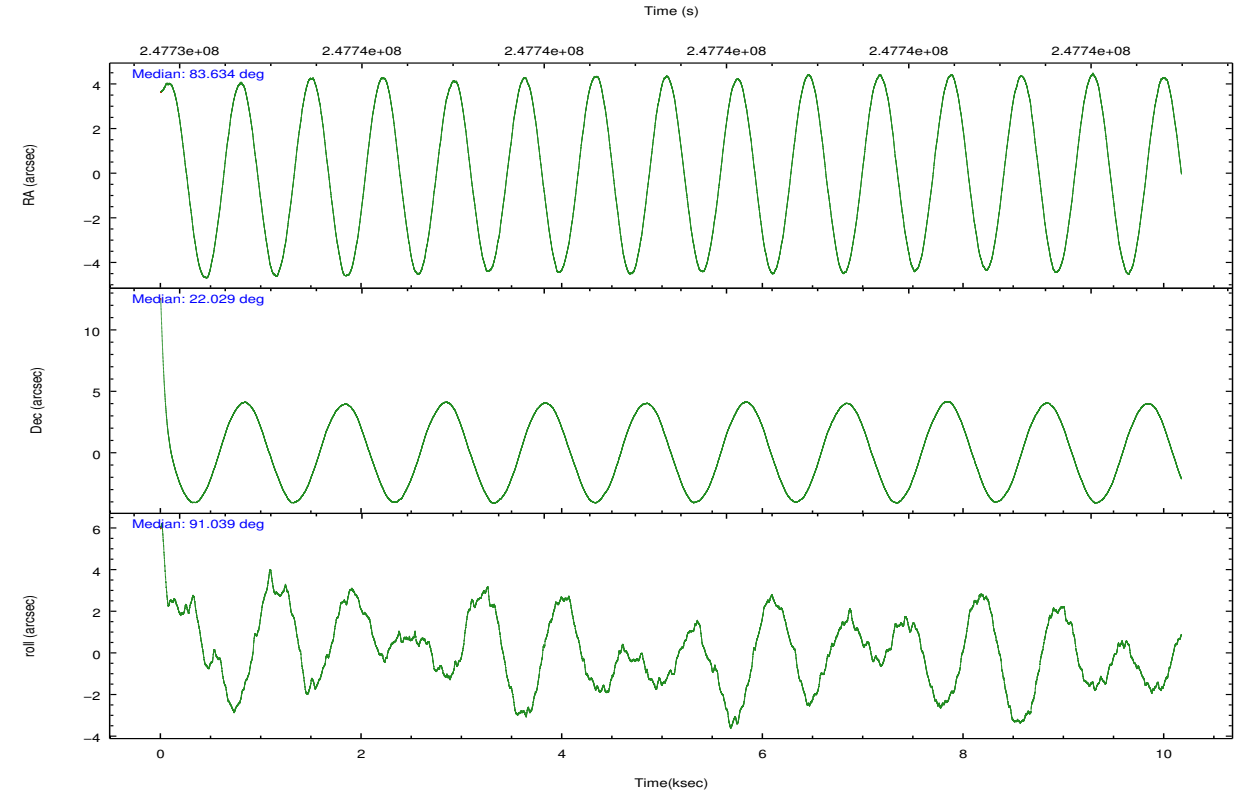
	ccd 7
grade 0 events	504721
	19%
grade 1 events	9646
	0%
grade 2 events	649715
	24%
grade 3 events	287069
	10%
grade 4 events	277099
	10%
grade 5 events	39560
	1%
grade 6 events	832319
	31%
grade 7 events	48263
	1%

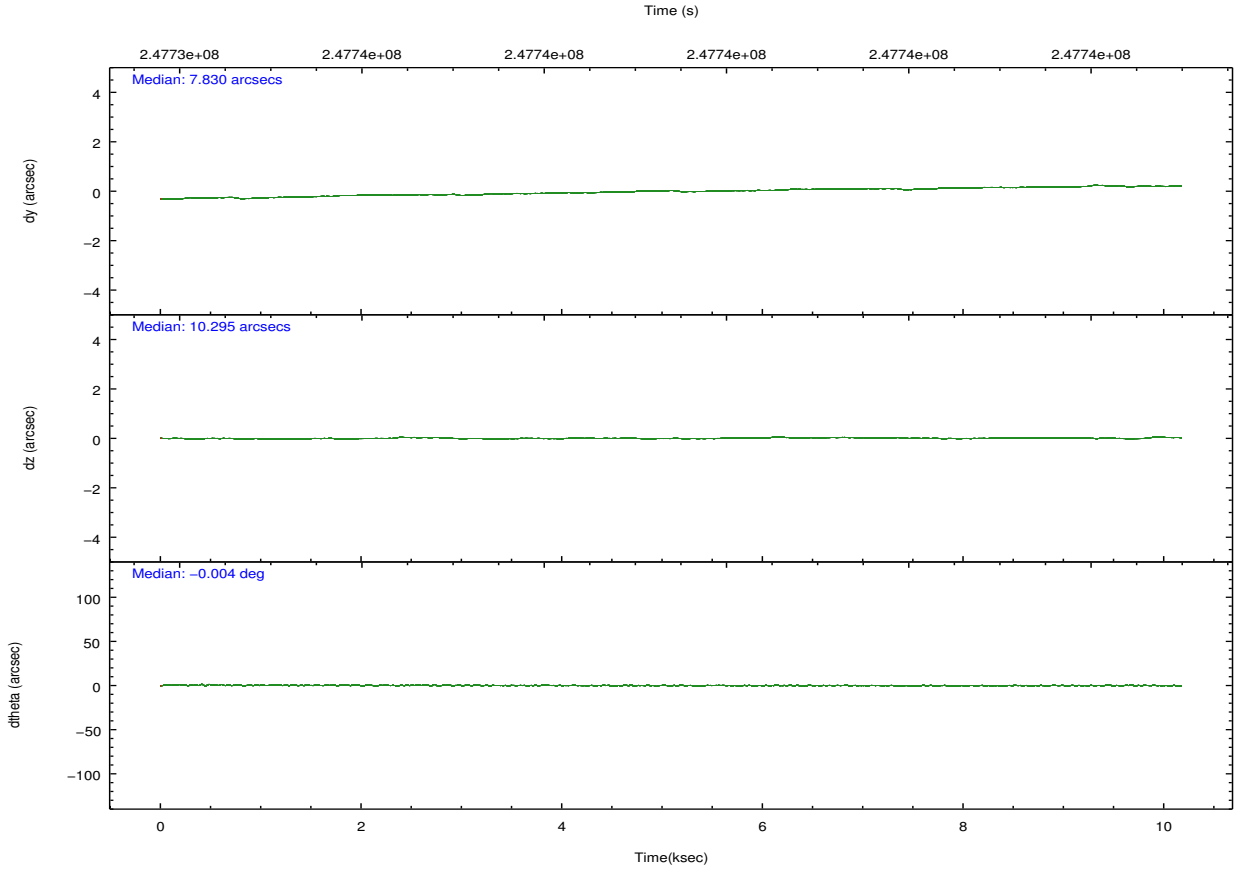
2.2 Compared Parameters

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	83.649160	83.63367957126704
[deg] Pointing Dec	22.005720	22.02887361674345
[deg] Pointing Roll	90.882482	91.0449159735055
[s] Window start time (MET)	247708864.184000	247708864.184000
[s] Window stop time (MET)	248313664.184000	248313664.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-182.132523	-182.1370004450064
[mm] SIM translation stage offset	-8	-7.995522138001405
[s] Observation start time (MET)	247734482.184000	247732870.67238
Observation start date	2005-11-07T07:06:58	2005-11-07T06:41:10
[s] Observation end time (MET)	247744482.184000	247745078.42294
Observation end date	2005-11-07T09:53:38	2005-11-07T10:04:38
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)
2.4773e+08
2.4774e+08
2.4774e+08
2.4774e+08
2.4774e+08
2.4774e+08
Median: 83.634 deg
RA (arcsec)
Median: 22.029 deg
Dec (arcsec)
Median: 91.039 deg
roll (arcsec)
Time(ksec)

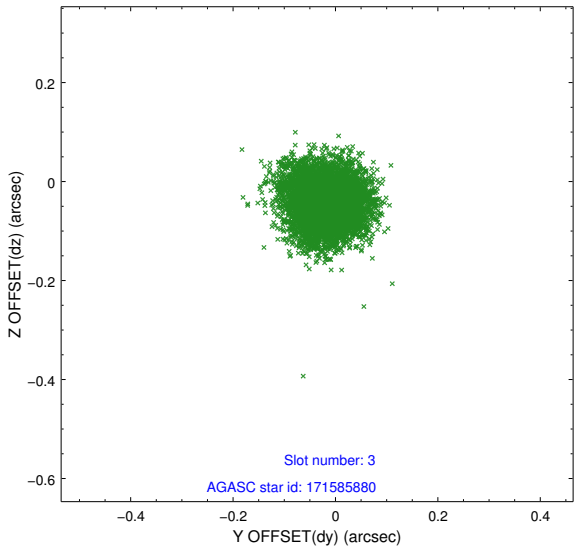

Time (s)
2.4773e+08
2.4774e+08
2.4774e+08
2.4774e+08
2.4774e+08
2.4774e+08
Median: 7.830 arcsecs
dy (arcsec)
Median: 10.295 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

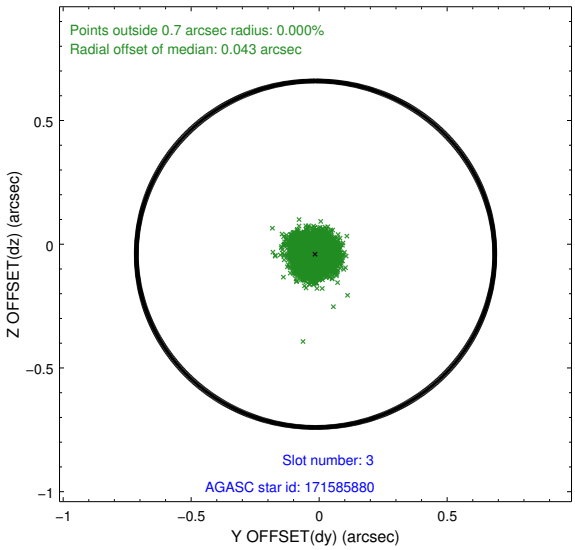
Slot Statistics

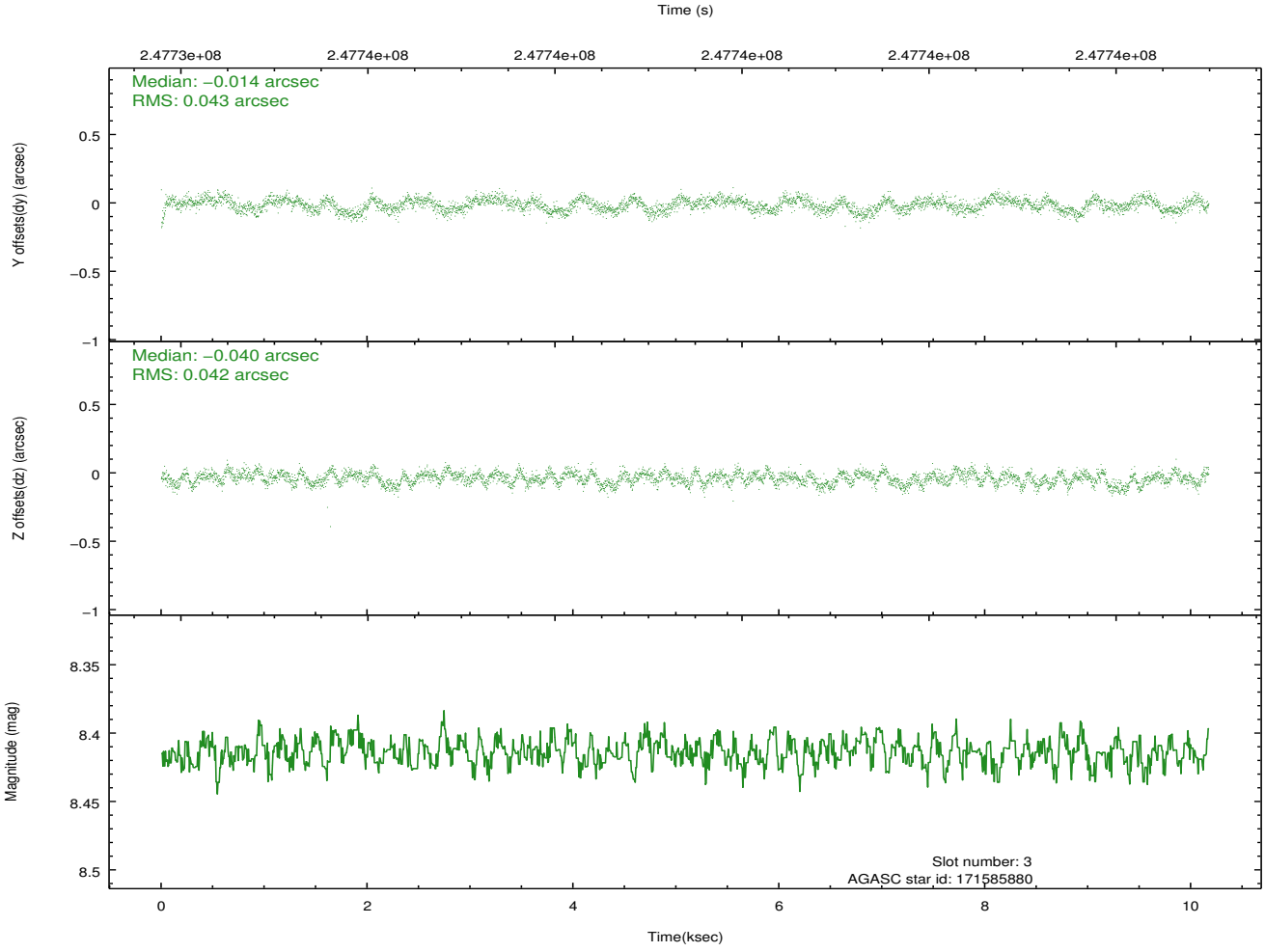
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	2482	-0.067	-0.095	0.007	0.012	0.000000	0.000000	-760.06	-1896.37
1	FID	ACIS-S-4	7.18	2482	0.114	0.058	0.006	0.010	0.000000	0.000000	2153.15	11.68
2	FID	ACIS-S-5	7.23	2482	-0.078	0.045	0.008	0.014	0.000000	0.000000	-1812.26	5.90
3	GUIDE	171585880	8.41	4964	-0.014	-0.040	0.065	0.100	83.676260	22.176319	612.99	-99.67
4	GUIDE	171586032	8.95	4963	-0.091	0.227	0.090	0.151	83.950197	22.083225	264.95	-1008.09
5	GUIDE	171721904	9.16	4961	-0.091	-0.028	0.128	0.195	84.272676	22.116922	372.98	-2085.56
6	GUIDE	243941560	8.32	4963	-0.061	0.066	0.074	0.111	83.733264	22.568598	2022.14	-310.75
7	GUIDE	171597832	9.15	4960	0.248	-0.224	0.086	0.137	83.183230	21.366702	-2273.02	1596.96

2.4 Star Slots

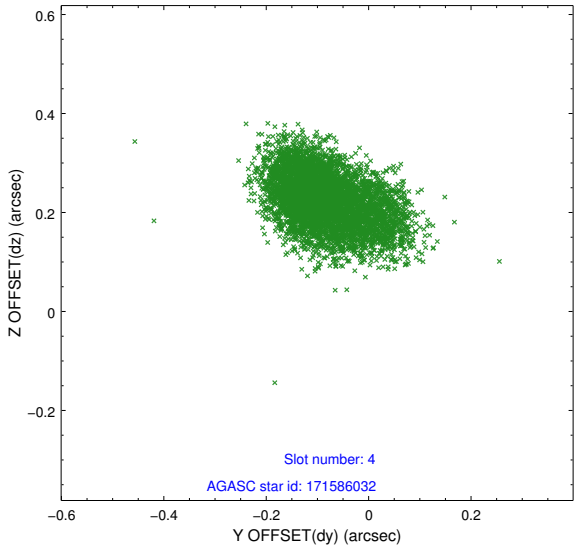
2.4.1 Slot 3

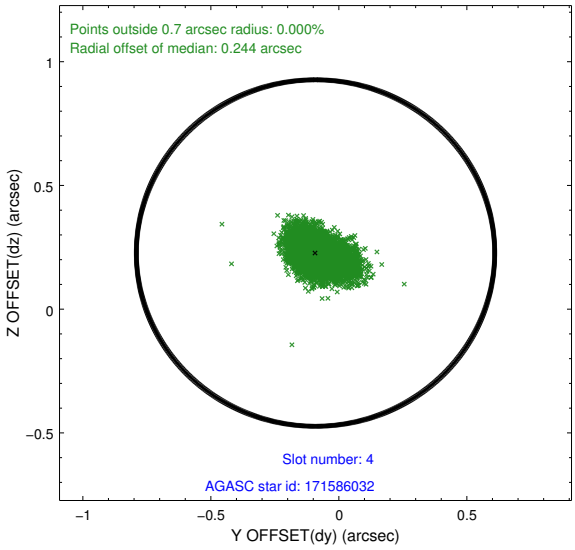


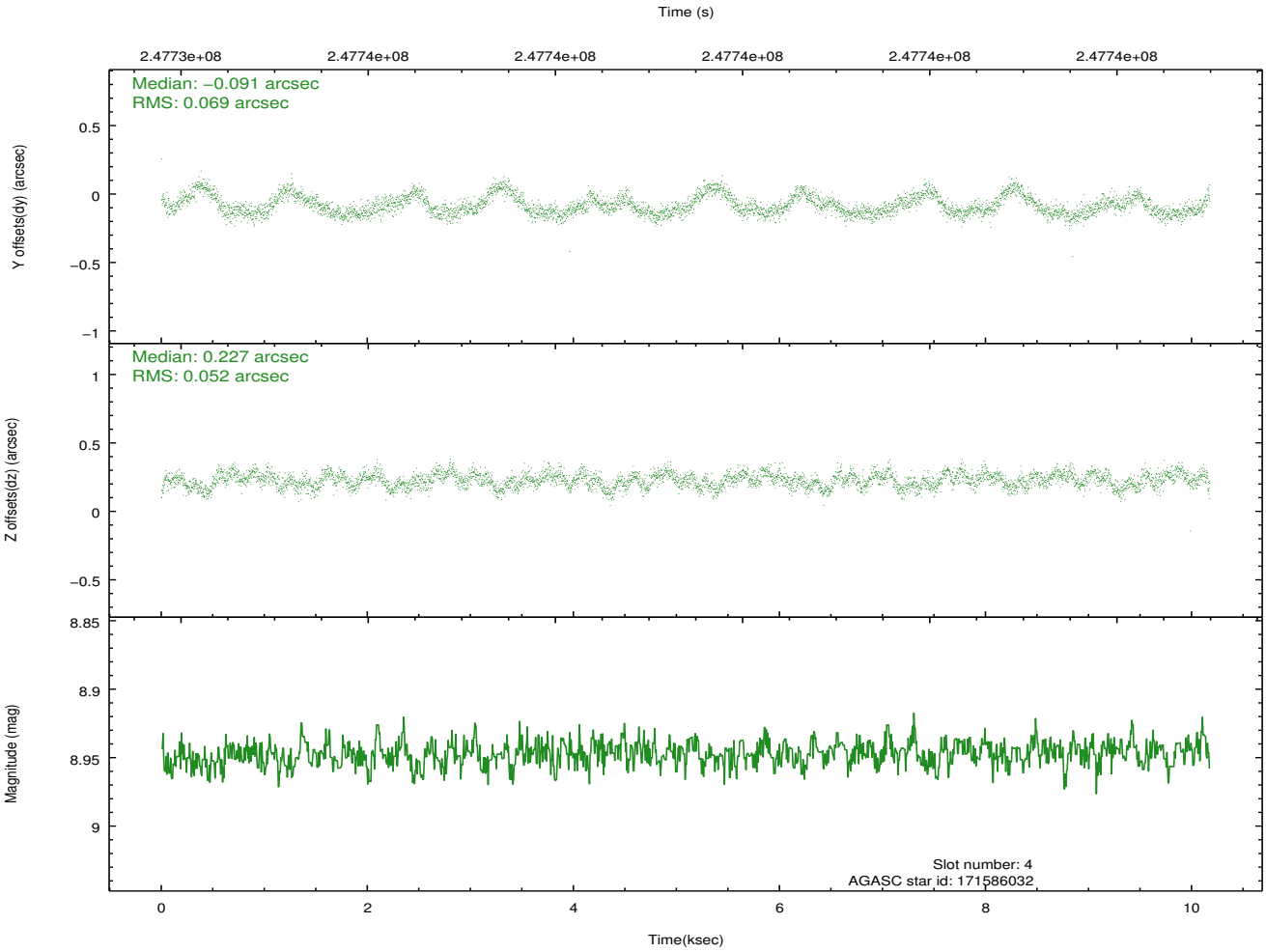




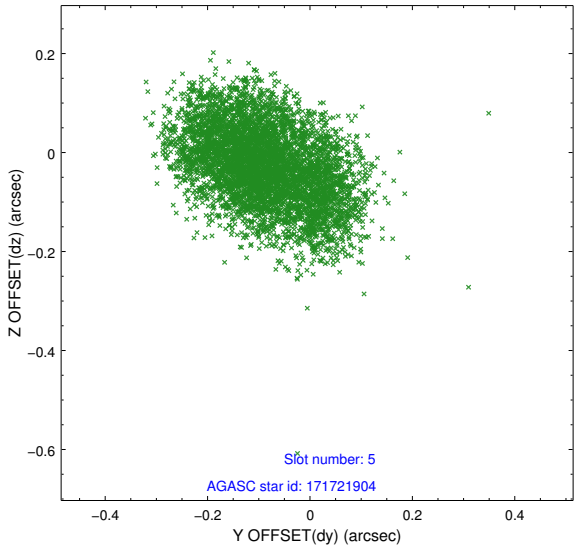
2.4.2 Slot 4

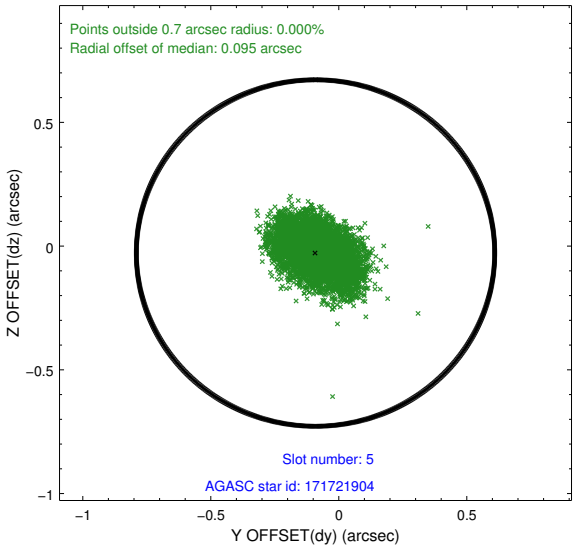

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032

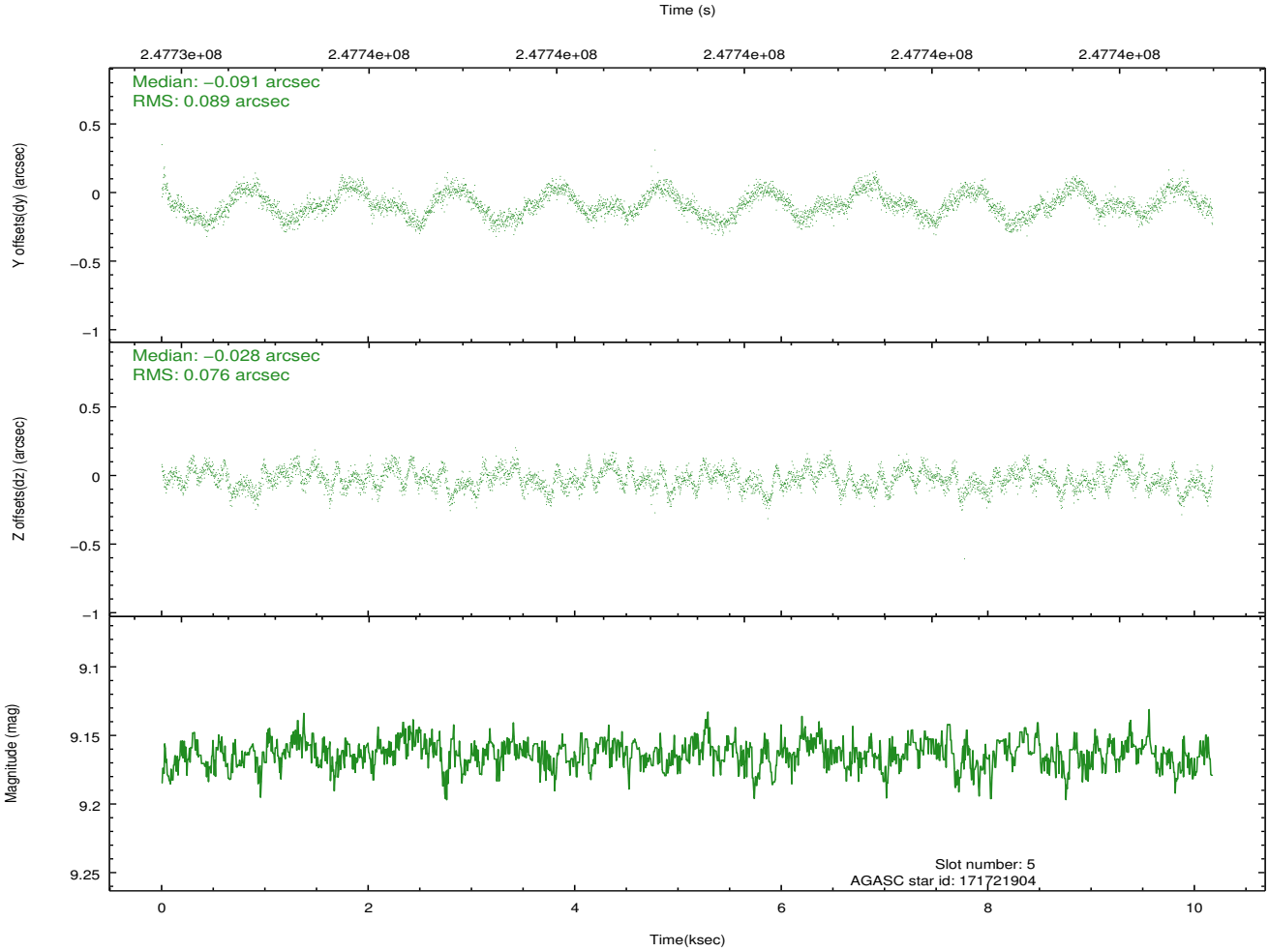

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.244 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 171586032


Time (s)
Median: −0.091 arcsec
RMS: 0.069 arcsec
Y offsets(dy) (arcsec)
Median: 0.227 arcsec
RMS: 0.052 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 171586032
Time(ksec)

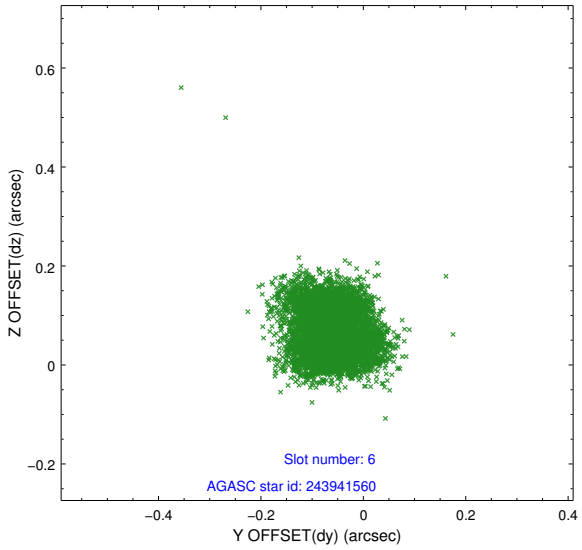
2.4.3 Slot 5

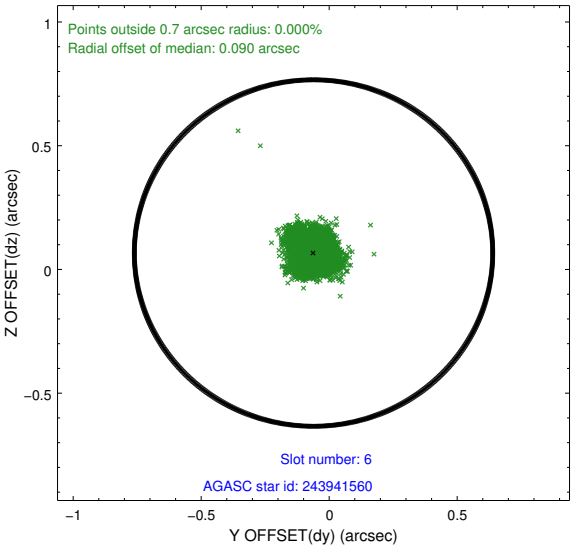

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171721904

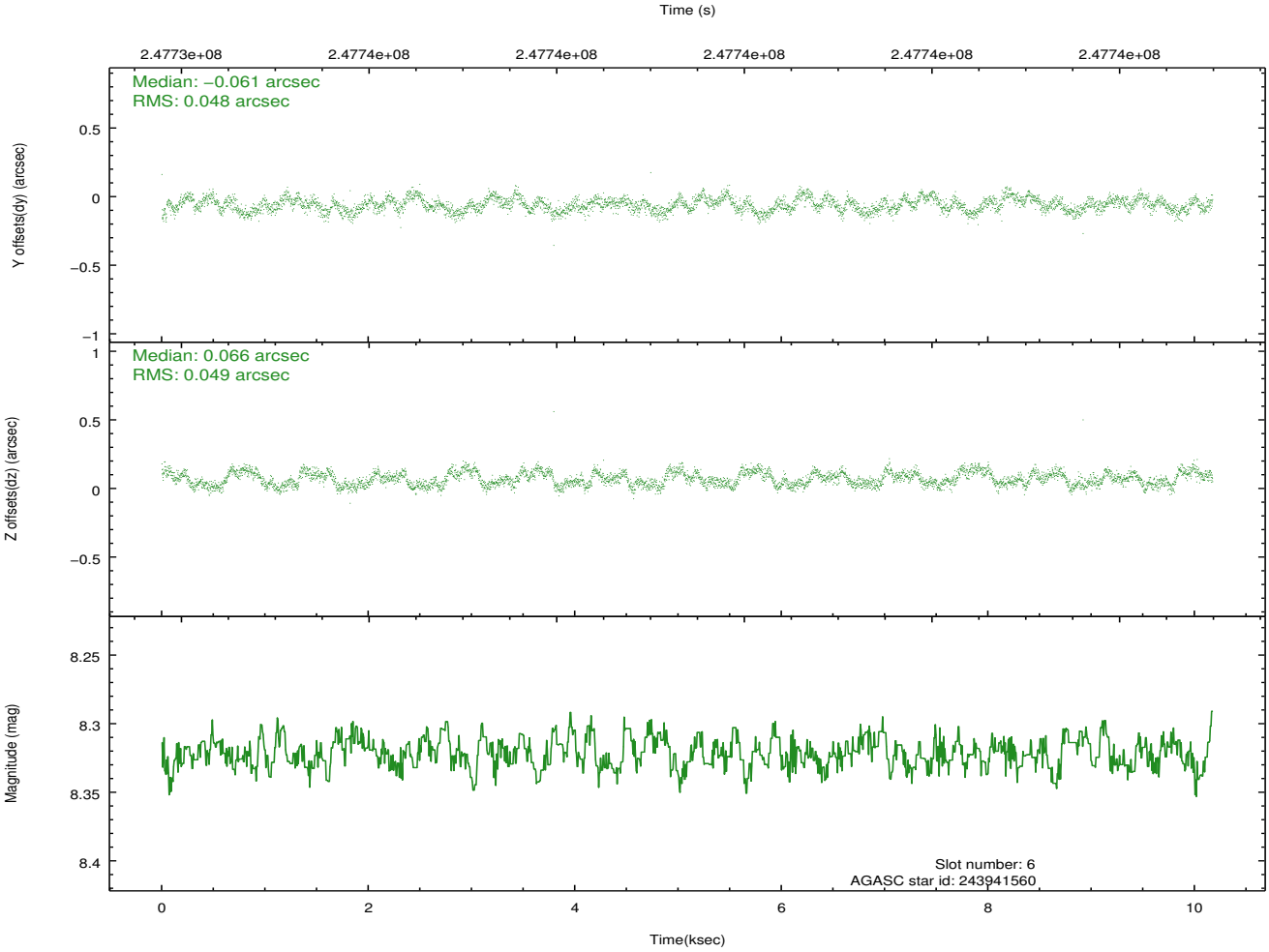

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.095 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 171721904


Time (s)
Median: −0.091 arcsec
RMS: 0.089 arcsec
Y offsets(dy) (arcsec)
Median: −0.028 arcsec
RMS: 0.076 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 171721904
Time(ksec)

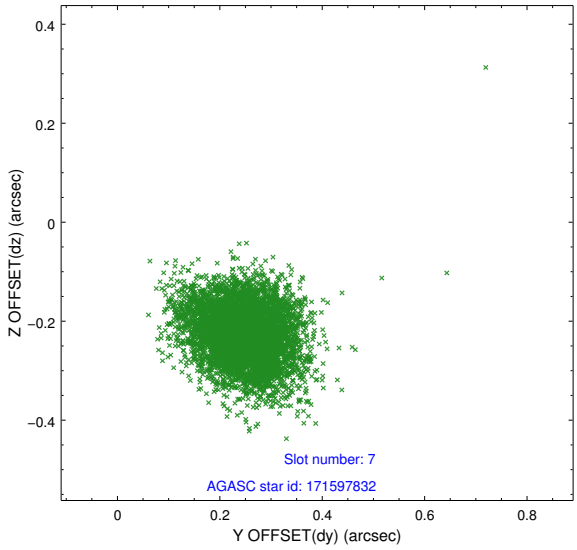
2.4.4 Slot 6

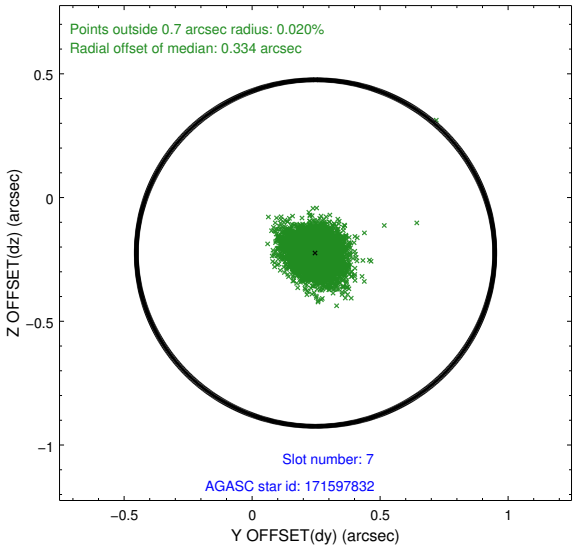

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 243941560

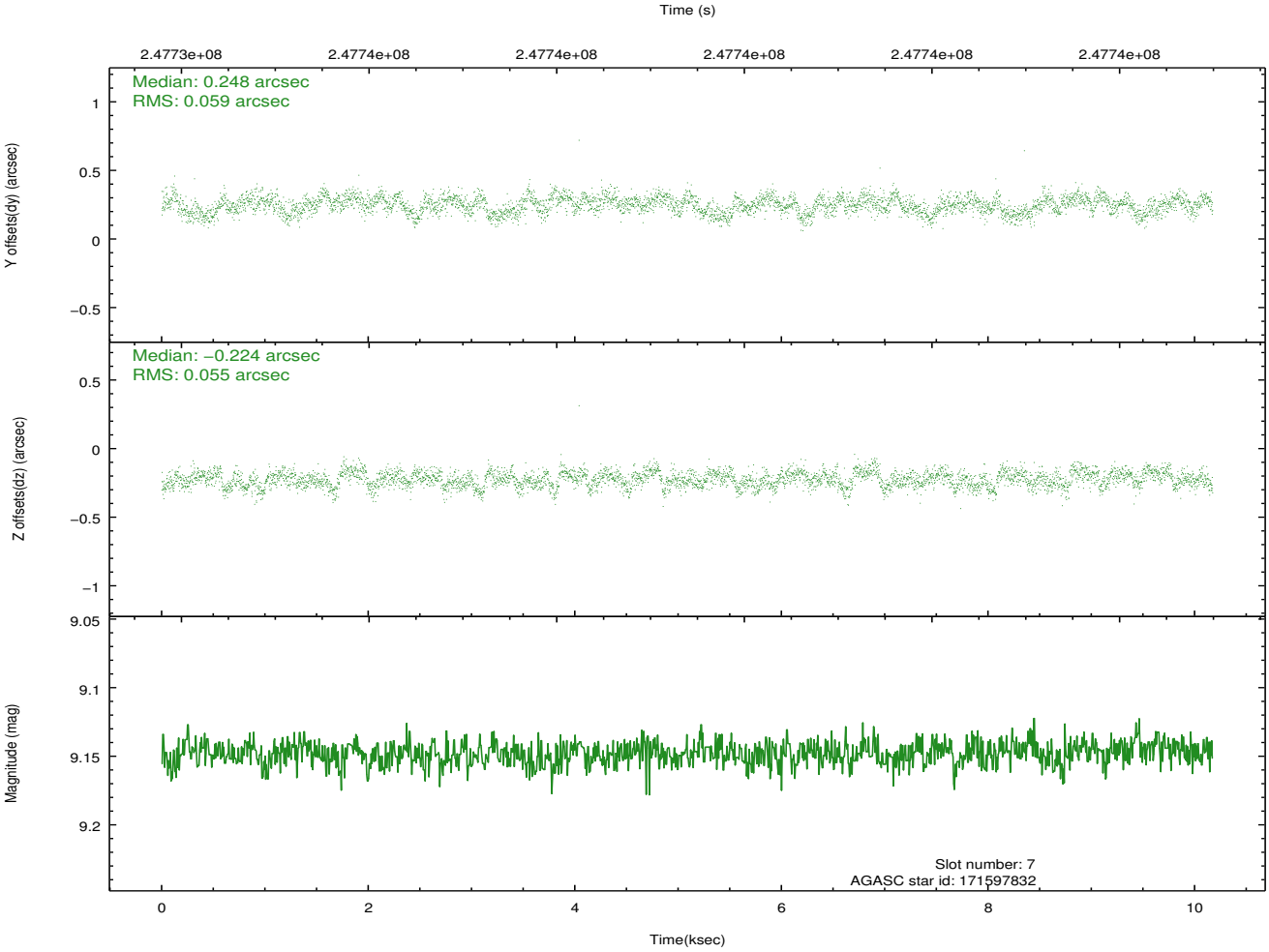

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.090 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 243941560


Time (s)
Median: −0.061 arcsec
RMS: 0.048 arcsec
Y offsets(dy) (arcsec)
Median: 0.066 arcsec
RMS: 0.049 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 243941560
Time(ksec)

2.4.5 Slot 7

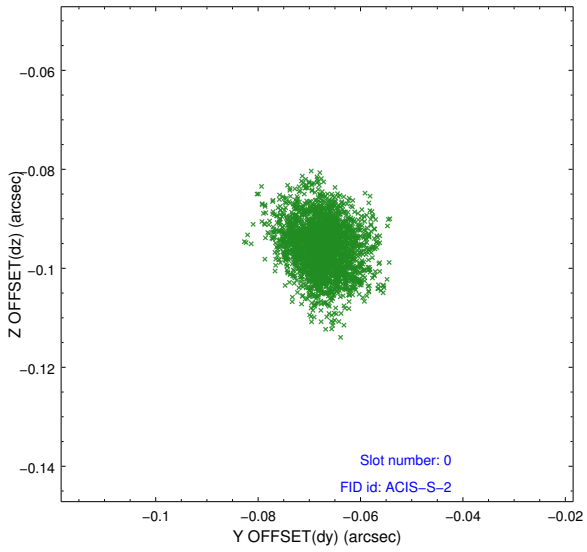

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 171597832

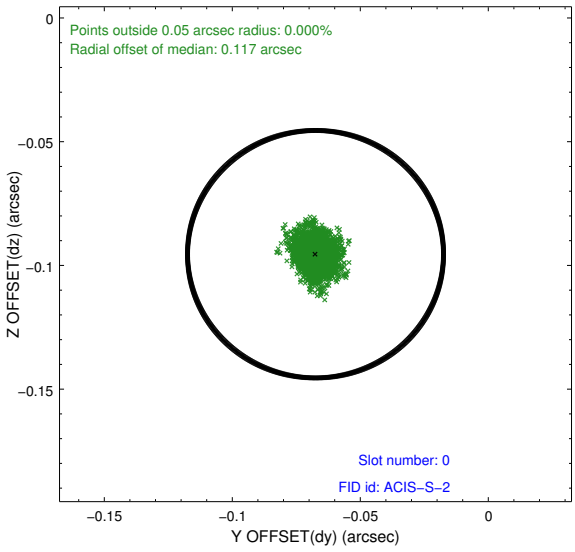

Points outside 0.7 arcsec radius: 0.020%
Radial offset of median: 0.334 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 171597832

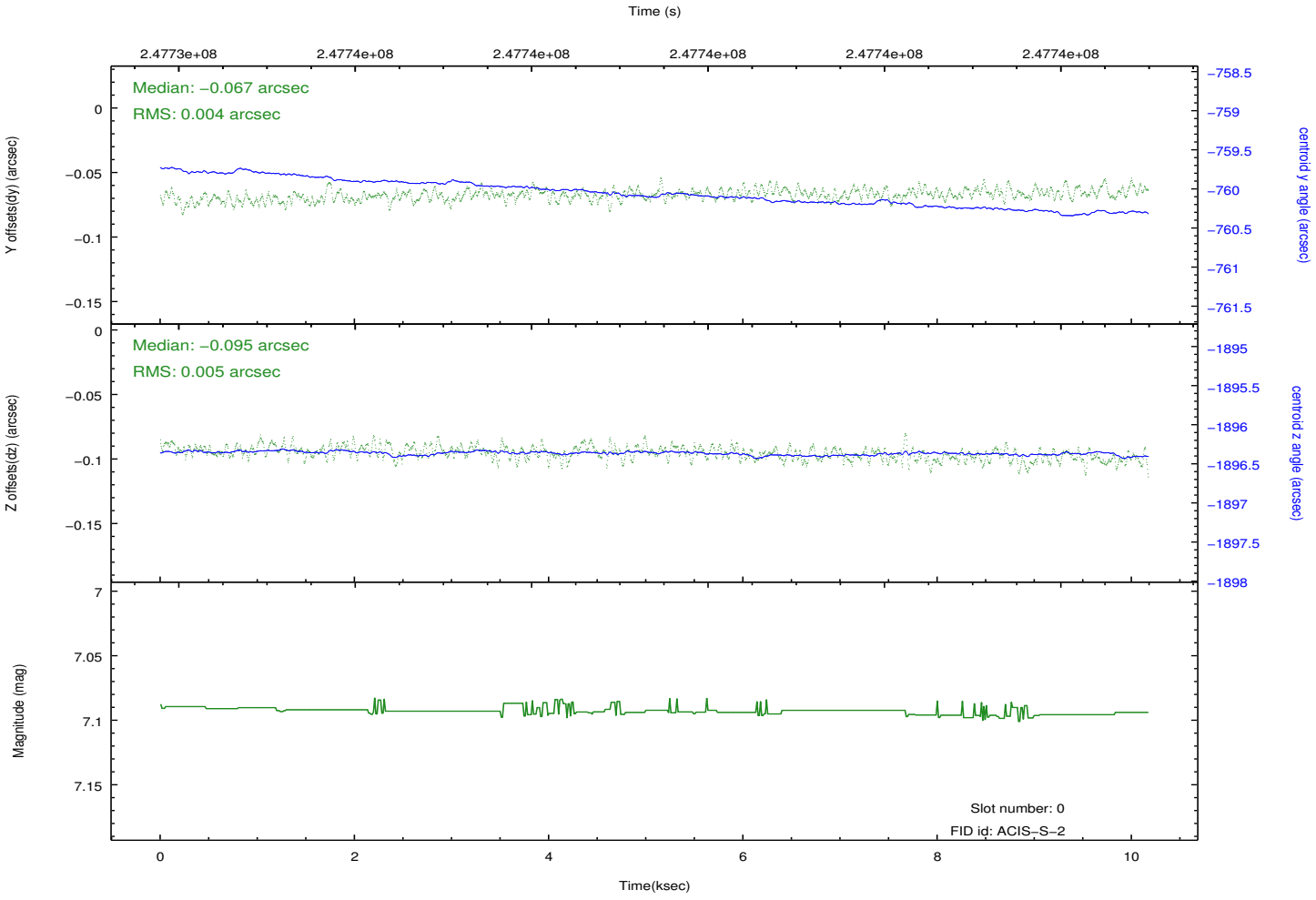

Time (s)
Median: 0.248 arcsec
RMS: 0.059 arcsec
Y offsets(dy) (arcsec)
Median: −0.224 arcsec
RMS: 0.055 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 171597832
Time(ksec)

2.5 FID Slots

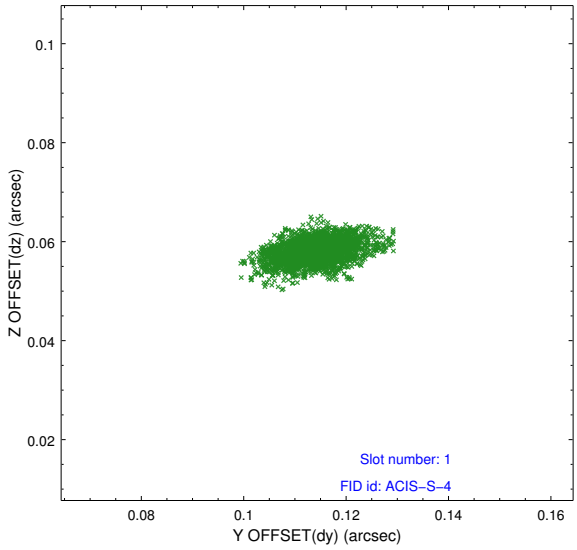
2.5.1 Slot 0

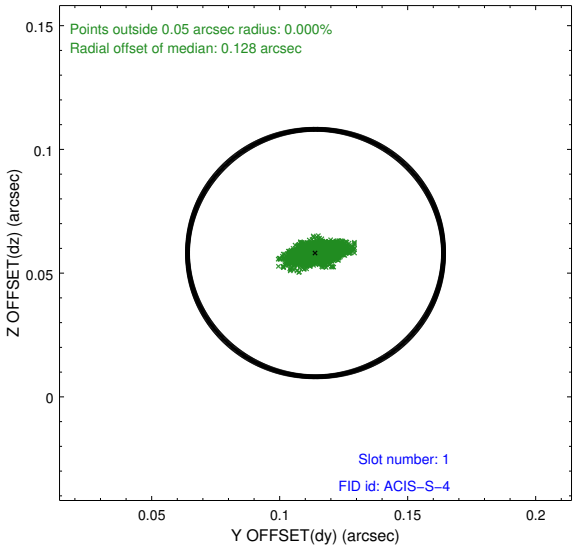


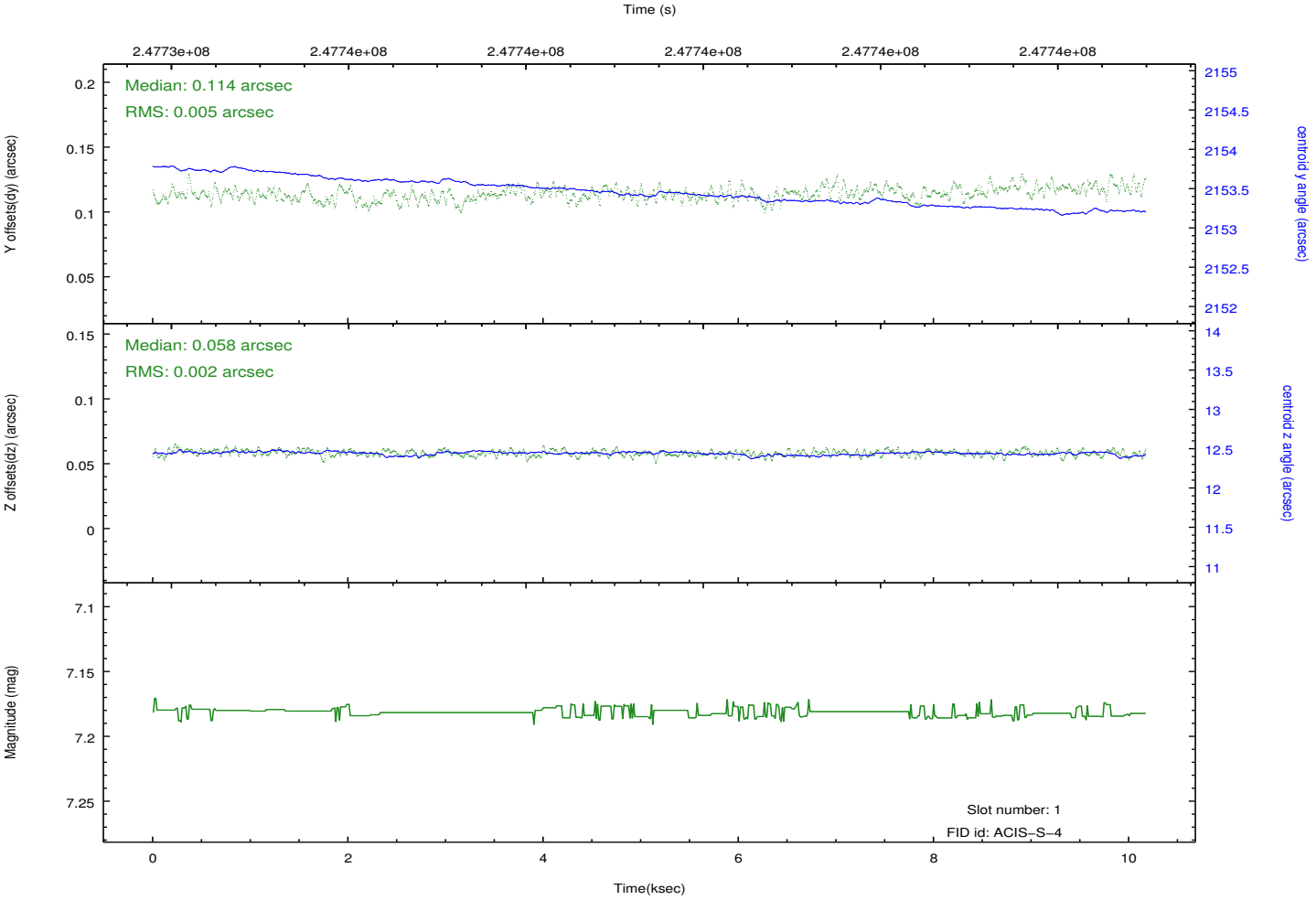




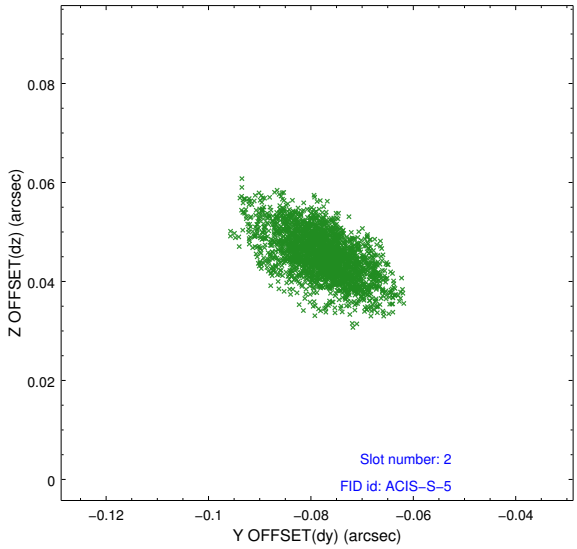
2.5.2 Slot 1

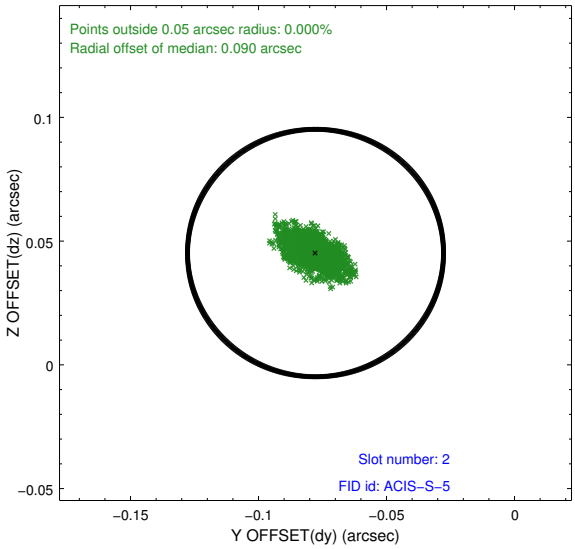

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

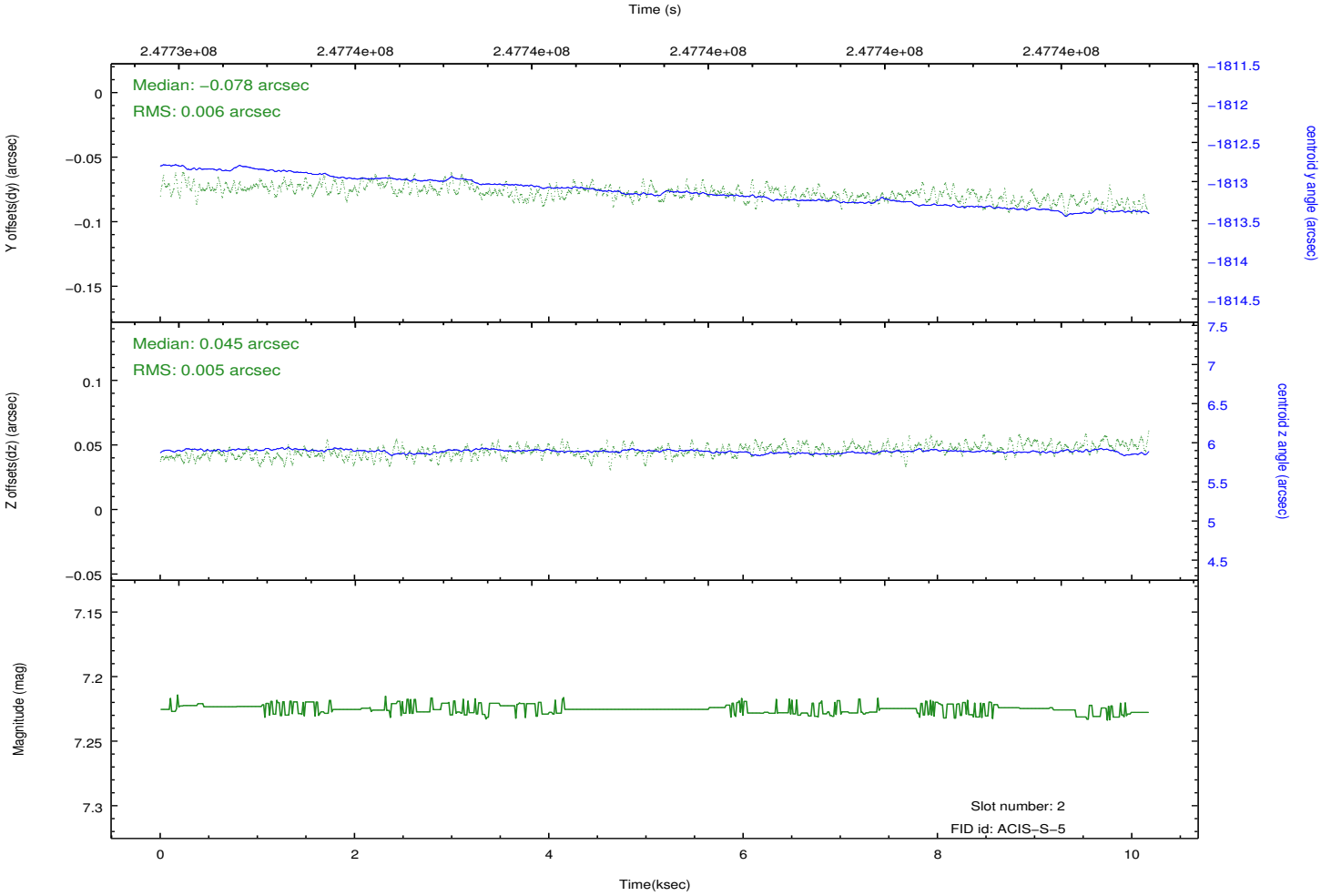

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.128 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.114 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.058 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

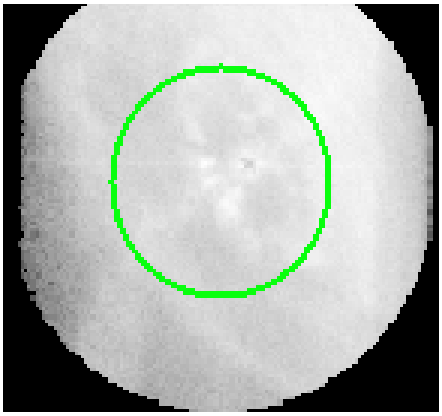

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.090 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Time (s)
Median: −0.078 arcsec
RMS: 0.006 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.045 arcsec
RMS: 0.005 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

3 Gratings

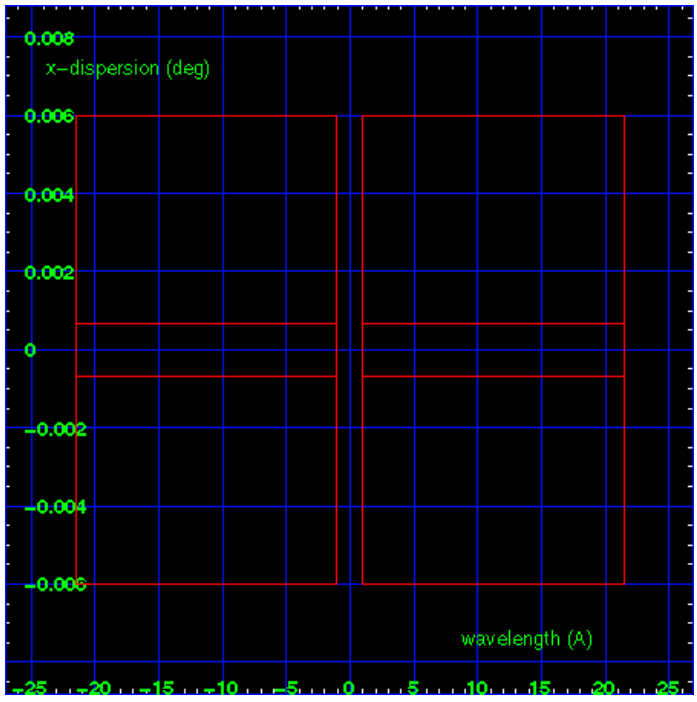
3.1 HEG Arm

HEG Order Sort 123

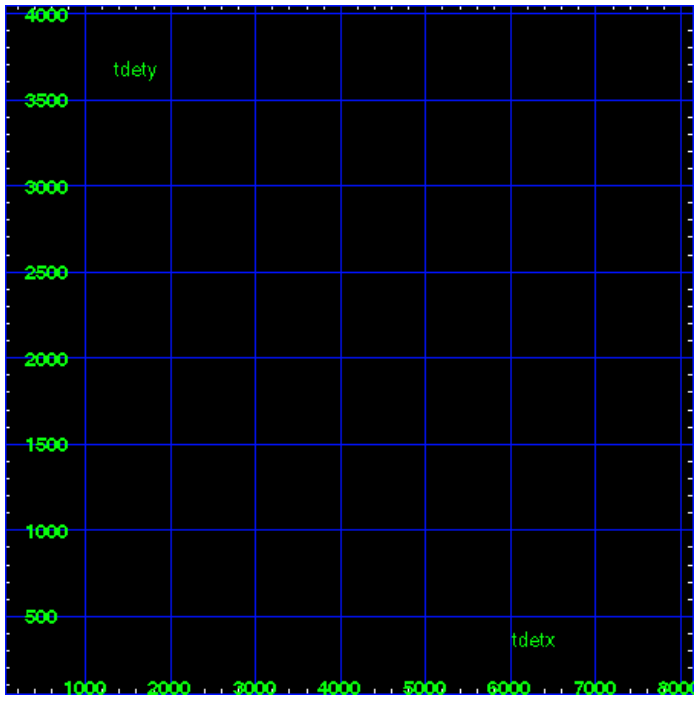


HEG Zero Order

HEG Order Sort ALL

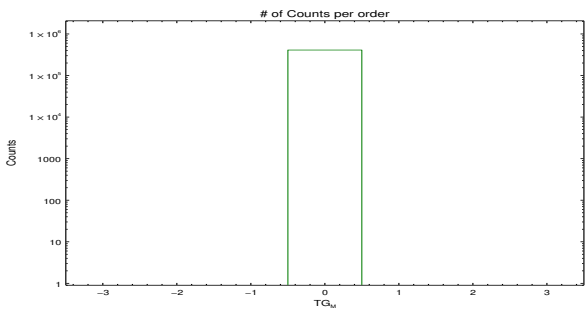


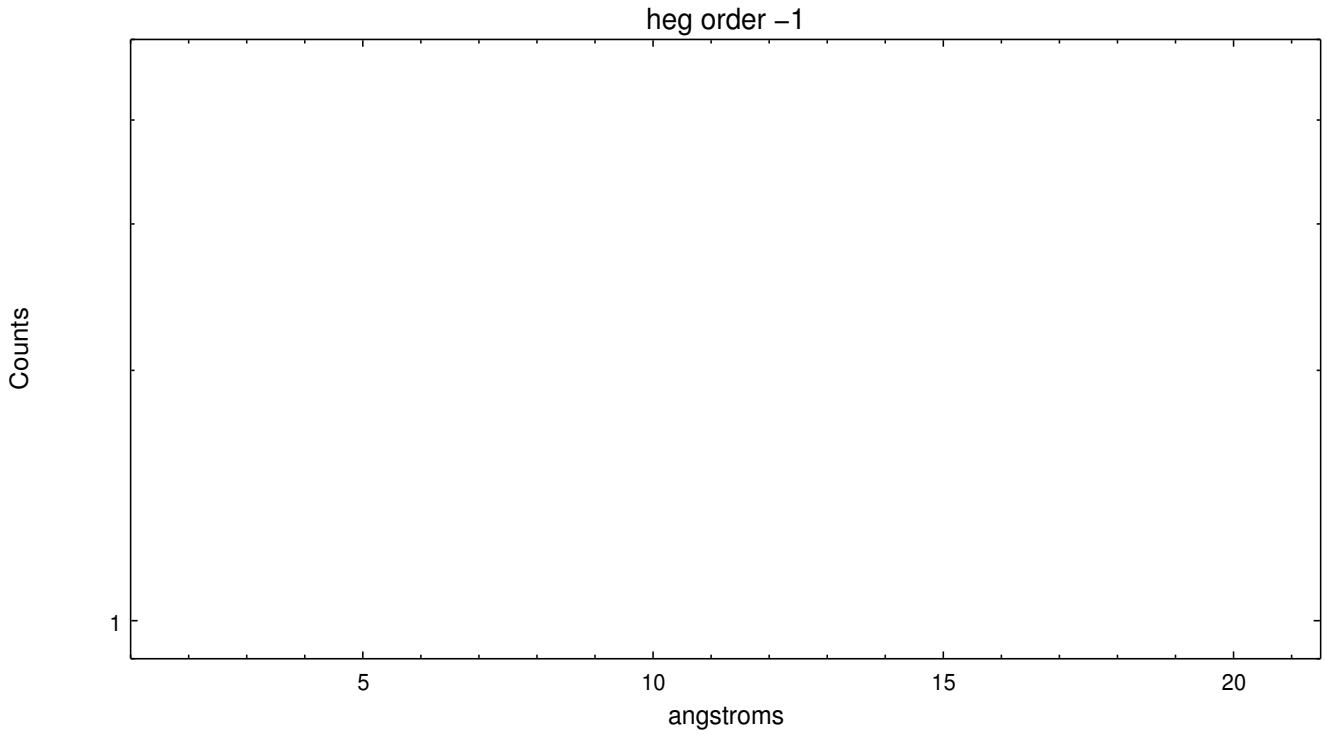
Spot Image HEG

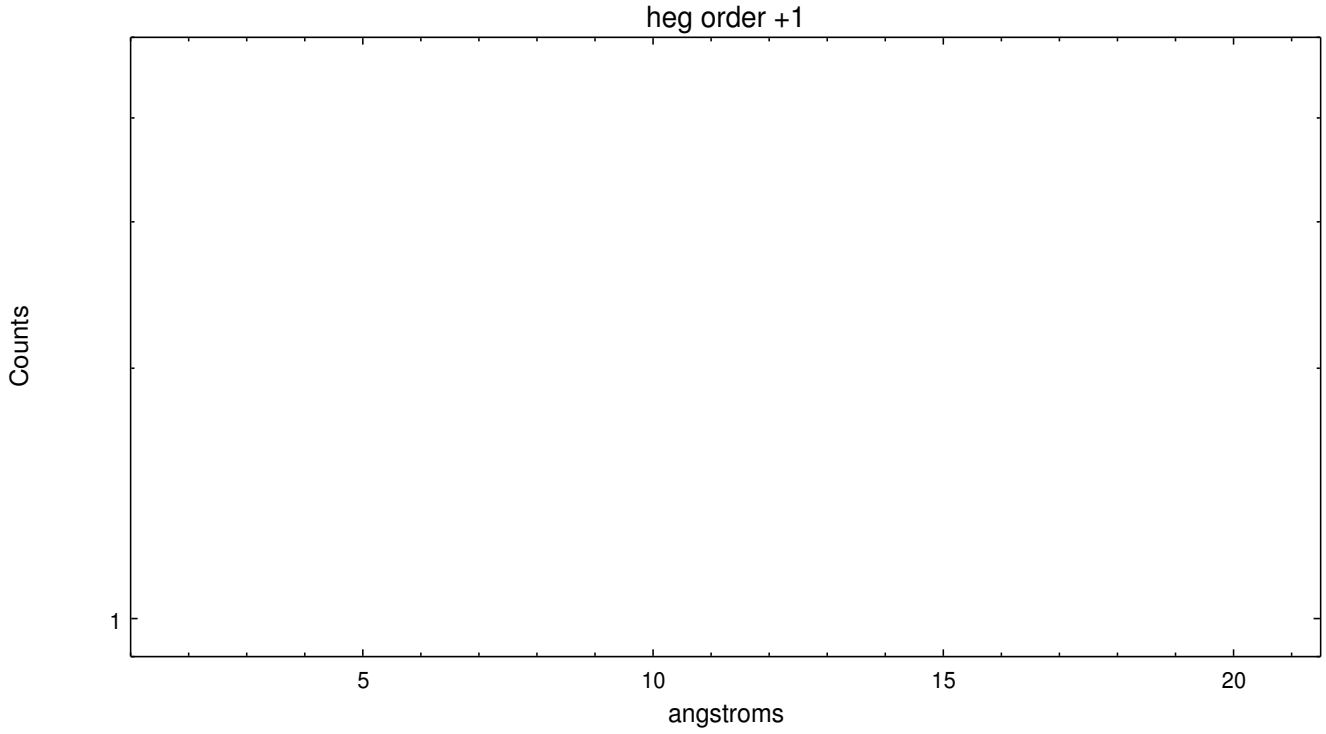


Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	0	414284	0	0	0

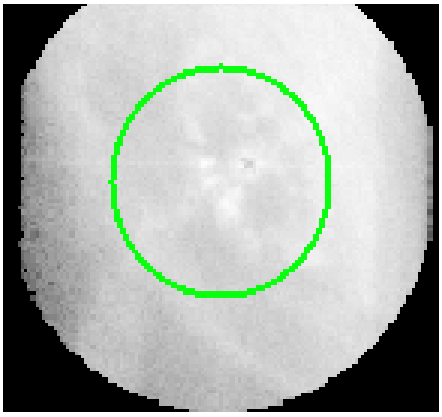



heg order −1
Counts
1
5
10
15
20
angstroms


heg order +1
Counts
1
5
10
15
20
angstroms

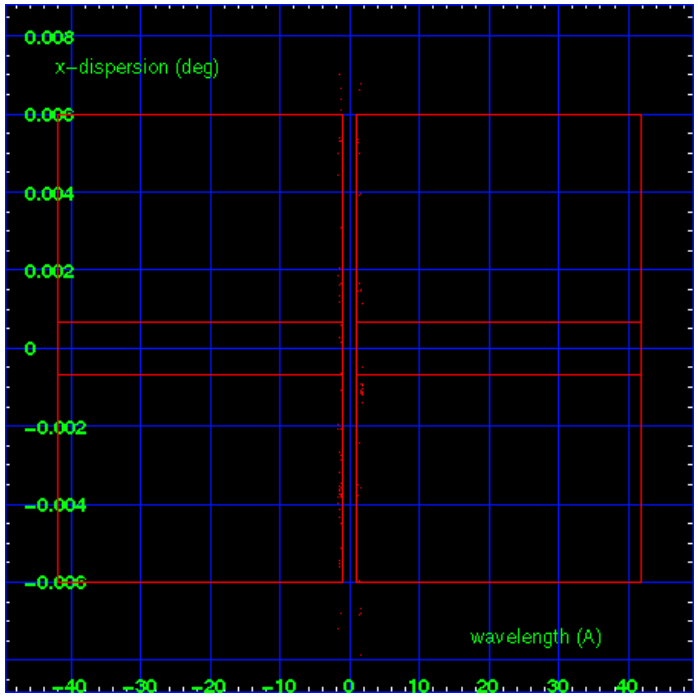
3.2 MEG Arm

MEG Order Sort 123

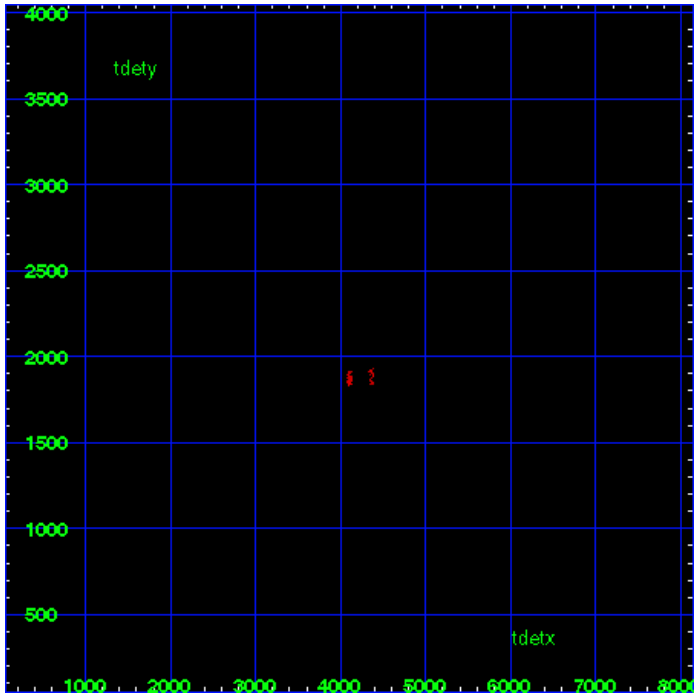


MEG Zero Order

MEG Order Sort ALL

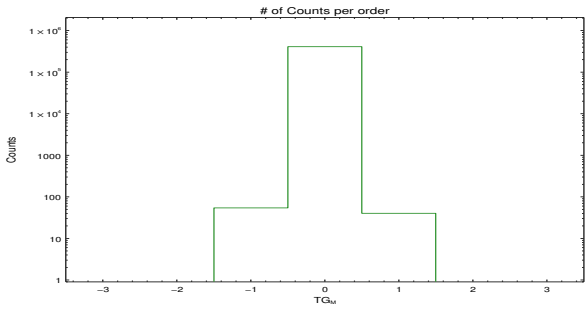


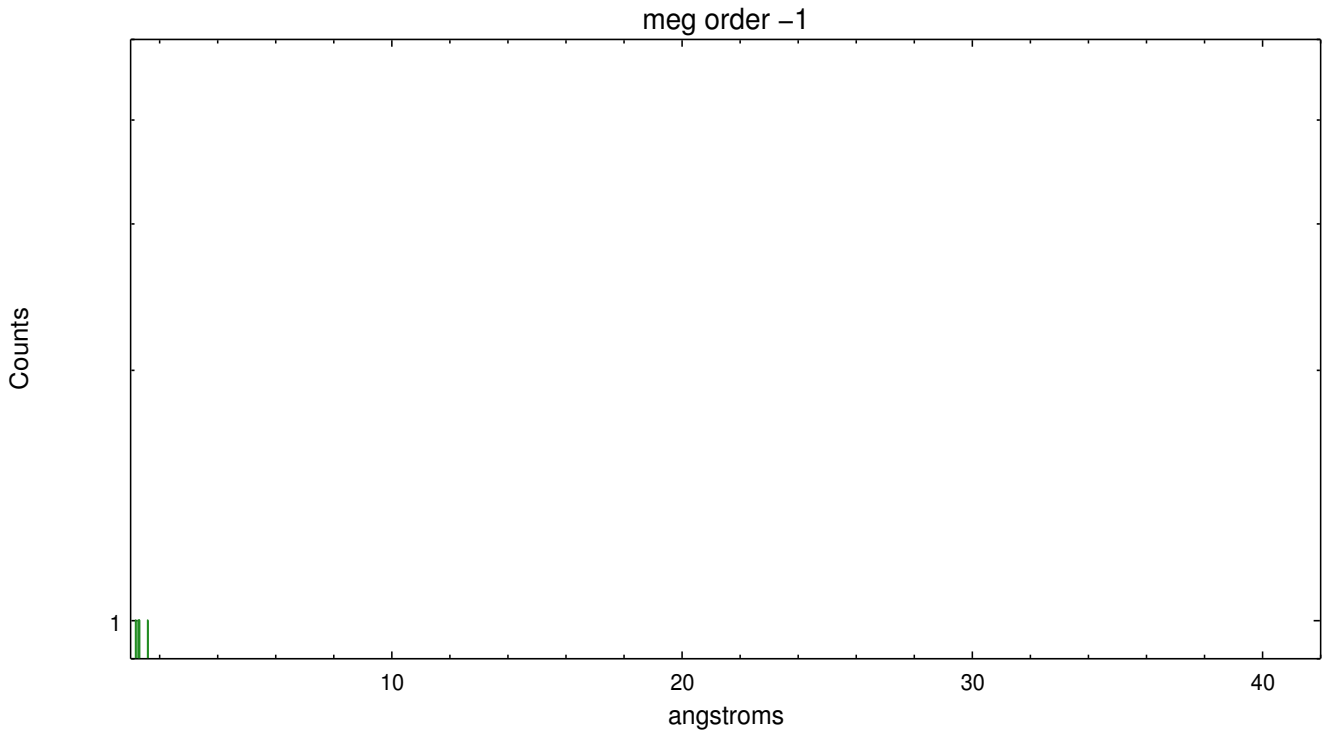
Spot Image MEG

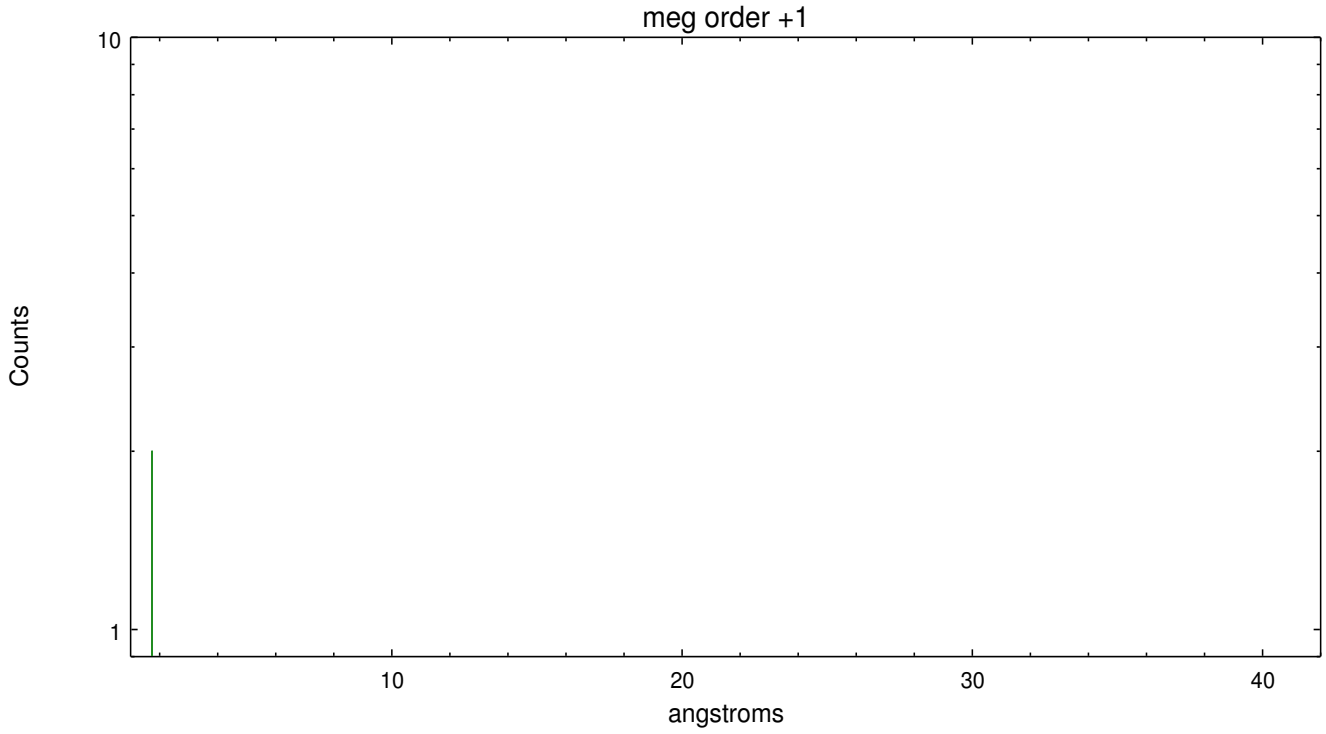


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	0	0	54	414284	40	0	0




meg order −1
Counts
1
10
20
30
40
angstroms


meg order +1
10
Counts
1
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2013.01.23
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	10.1736

A.2 Comments

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 some bright emission knots 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 orders 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.