V&V Reference Report
L2 ASCDS Version : 7.6.10

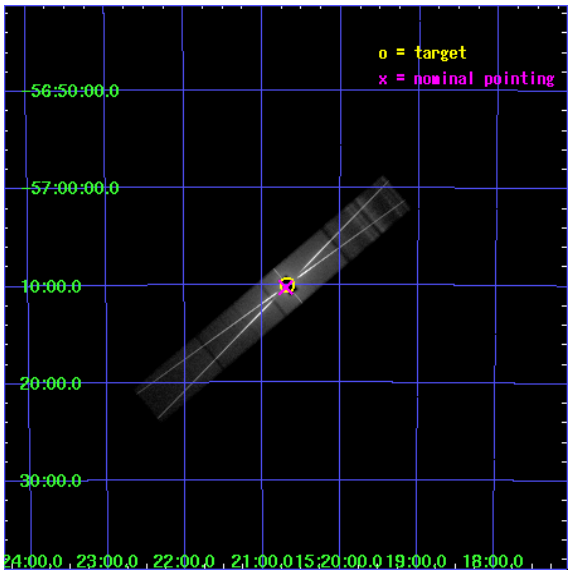
Observation 1700 - L2 Version 6
Chandra X-Ray Center

L2 Processing Date : Jul 23 2007

Contents

1 Front

seq_num	400073
obs_id	1700
title	HETG ZERO PHASE SPECTROSCOPY OF CIRCINUS X-1
observer	Prof. William Brandt
object	CIR X-1
dtycycle	0
cycle	P
ra_targ	230.170833
dec_targ	-57.166667
ra_nom	230.17479370692
dec_nom	-57.170814806839
roll_nom	319.79078376746
revision	6
ontime	15322.100026861
livetime	14960.92567986
ontime5	15322.100026861
ontime6	15322.100026861
ontime7	15322.100026861
ontime8	15322.100026861
l2events	1360512

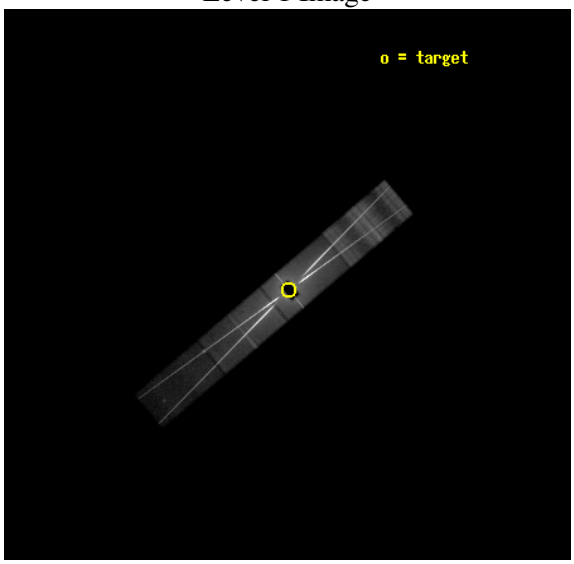


2 OBI

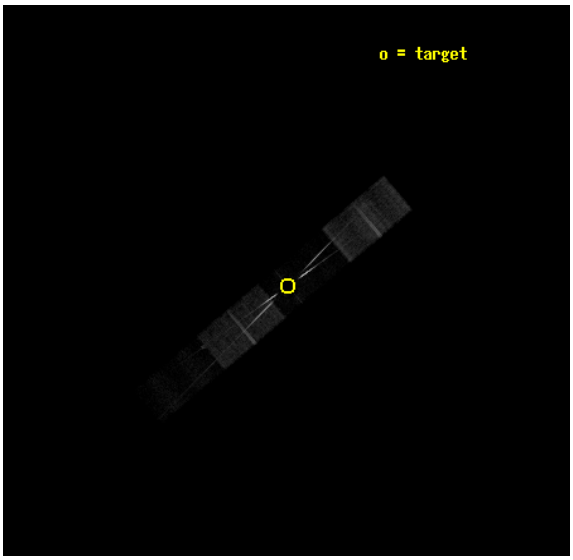
2.1 OBI

2.1.1 Images

Level 1 Image



Level 1 Bad Events



2.1.2 Parameters

obi_num	0
ascdsver	7.6.10
caldbver	3.4.0
date	2007-05-25T09:53:39
revision	4

sched_exp_time	14885.000000
ontime	15322.100026861
ontime5	15322.100026861
ontime6	15322.100026861
ontime7	15322.100026861
ontime8	15322.100026861
l1events	1685316

2.1.3 Events

	ccd 5	**ccd 6**	**ccd 7**	**ccd 8**
level 1 events	77807	552891	766828	287790
rejected events	13803	76736	48331	75031
rejected %	17%	13%	6%	26%

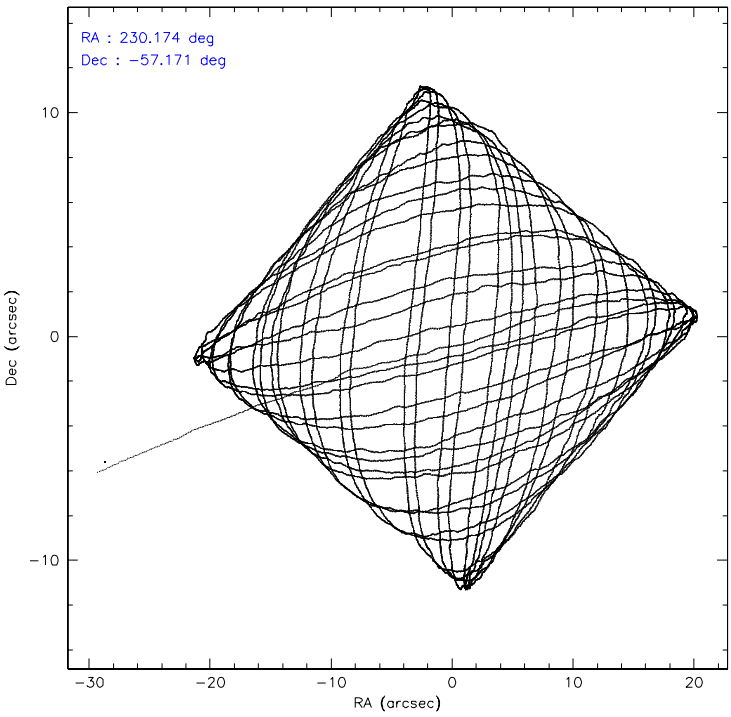
	ccd 5	**ccd 6**	**ccd 7**	**ccd 8**
grade 0 events	12569	317362	127206	105667
	16%	57%	16%	36%
grade 1 events	224	7113	3048	516
	0%	1%	0%	0%
grade 2 events	23548	72446	186452	28569
	30%	13%	24%	9%
grade 3 events	4793	24592	69230	24776
	6%	4%	9%	8%
grade 4 events	5145	24335	68223	21890
	6%	4%	8%	7%
grade 5 events	2292	6222	16560	2510
	2%	1%	2%	0%
grade 6 events	18058	38139	268408	32191
	23%	6%	35%	11%
grade 7 events	11178	62682	27701	71671
	14%	11%	3%	24%

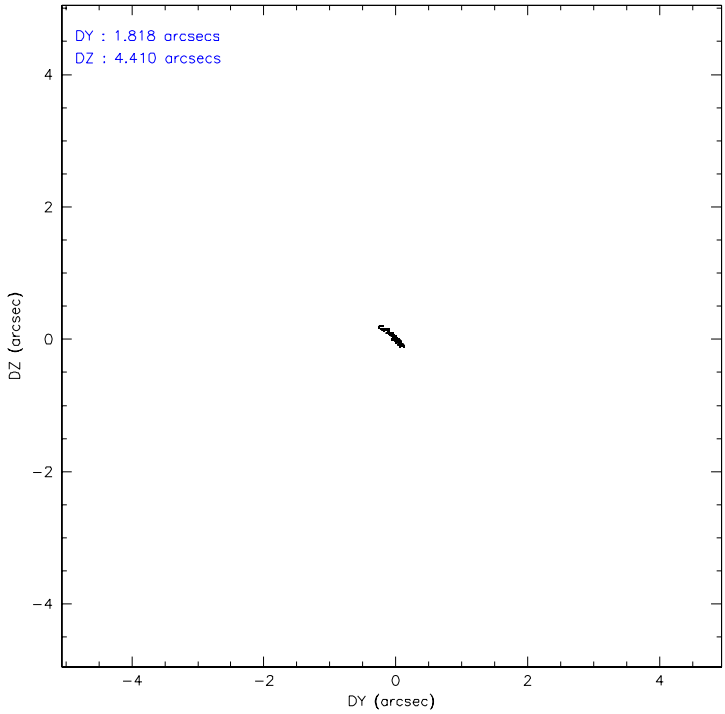
2.2 Compared Parameters

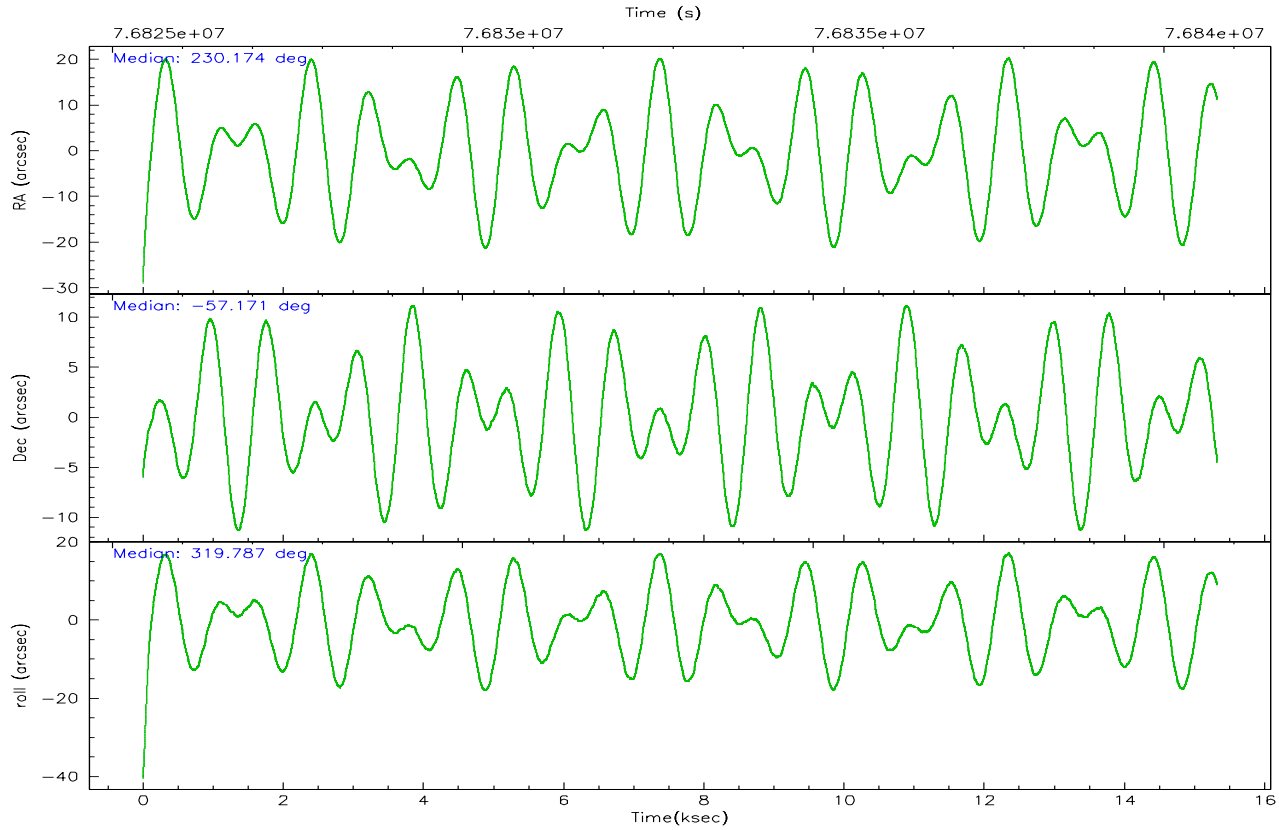
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-5678	ACIS-5678
Grating	HETG	HETG
Data mode	GRADED	GRADED
Observation mode	POINTING	POINTING
Pointing RA	230.124955	230.1747937069242
Pointing Dec	-57.166080	-57.17081480683873
Pointing Roll	319.592284	319.7907837674628
SIM focus pos (mm)	-0.684267	-0.6828225247311905
SIM defocus (mm)	0	0.001444936568705701
SIM translation stage pos (mm)	-184.532523	-184.5306286120915
SIM translation stage offset (mm)	-5.6	-5.601893970916279
Phase constraints	Y	Y
Phase period	16.540100	16.540100
Phase epoch	51355.944980	51355.944980
Phase start	0.950000	0.950000
Phase end	0.050000	0.050000
Phase start error	0.000000	0.000000
Phase end error	0.000000	0.000000
Observation start time	76825879.184000	76824781.704579
Observation start date	2000-06-08T04:30:15	2000-06-08T04:13:01
Observation end time	76840764.184000	76841388.755191
Observation end date	2000-06-08T08:38:20	2000-06-08T08:49:48
Read mode	TIMED	TIMED

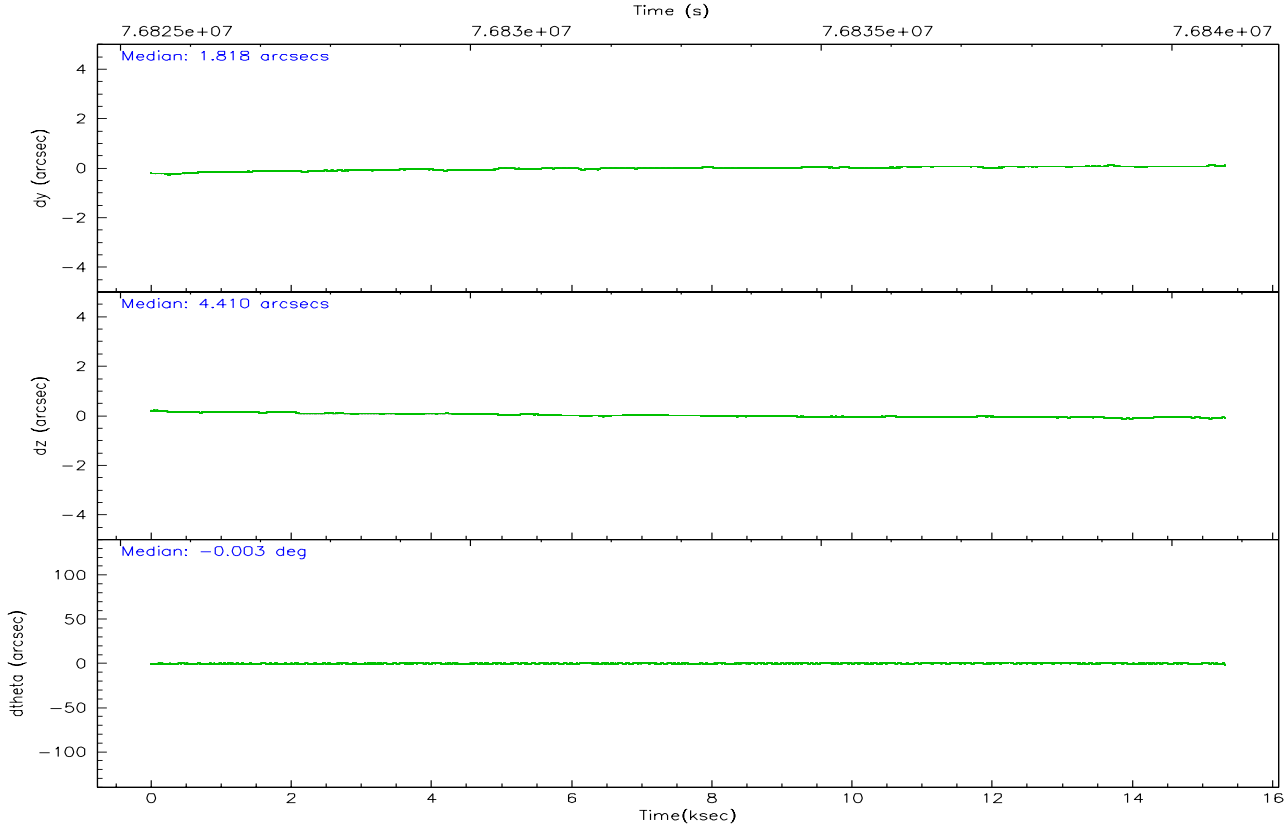
Parameter	Planned	Actual
Obspar format version number	6	6
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	CUSTOM
Subarray start row	15	15
Subarray row count	542	542
Alternating exposures requested	N	N
Primary exposure time	3.200000	1.7

2.3 Aspect


RA : 230.174 deg
Dec : −57.171 deg
10
0
−10
Dec (arcsec)
−30
−20
−10
0
10
20
RA (arcsec)


DY : 1.818 arcsecs
DZ : 4.410 arcsecs
4
2
0
−2
−4
DZ (arcsec)
−4
−2
0
2
4
DY (arcsec)


Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: 230.174 deg
RA (arcsec)
Median: −57.171 deg
Dec (arcsec)
Median: 319.787 deg
roll (arcsec)
Time(ksec)

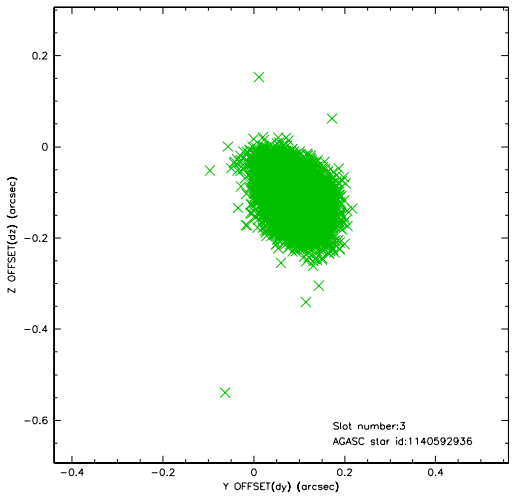

Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: 1.818 arcsecs
dy (arcsec)
Median: 4.410 arcsecs
dz (arcsec)
Median: −0.003 deg
dtheta (arcsec)
Time(ksec)

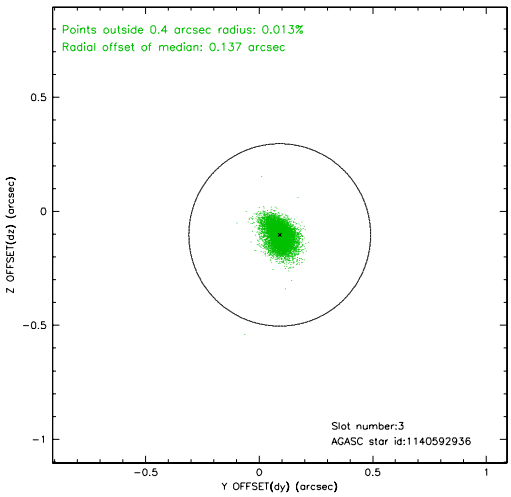
Slot Statistics

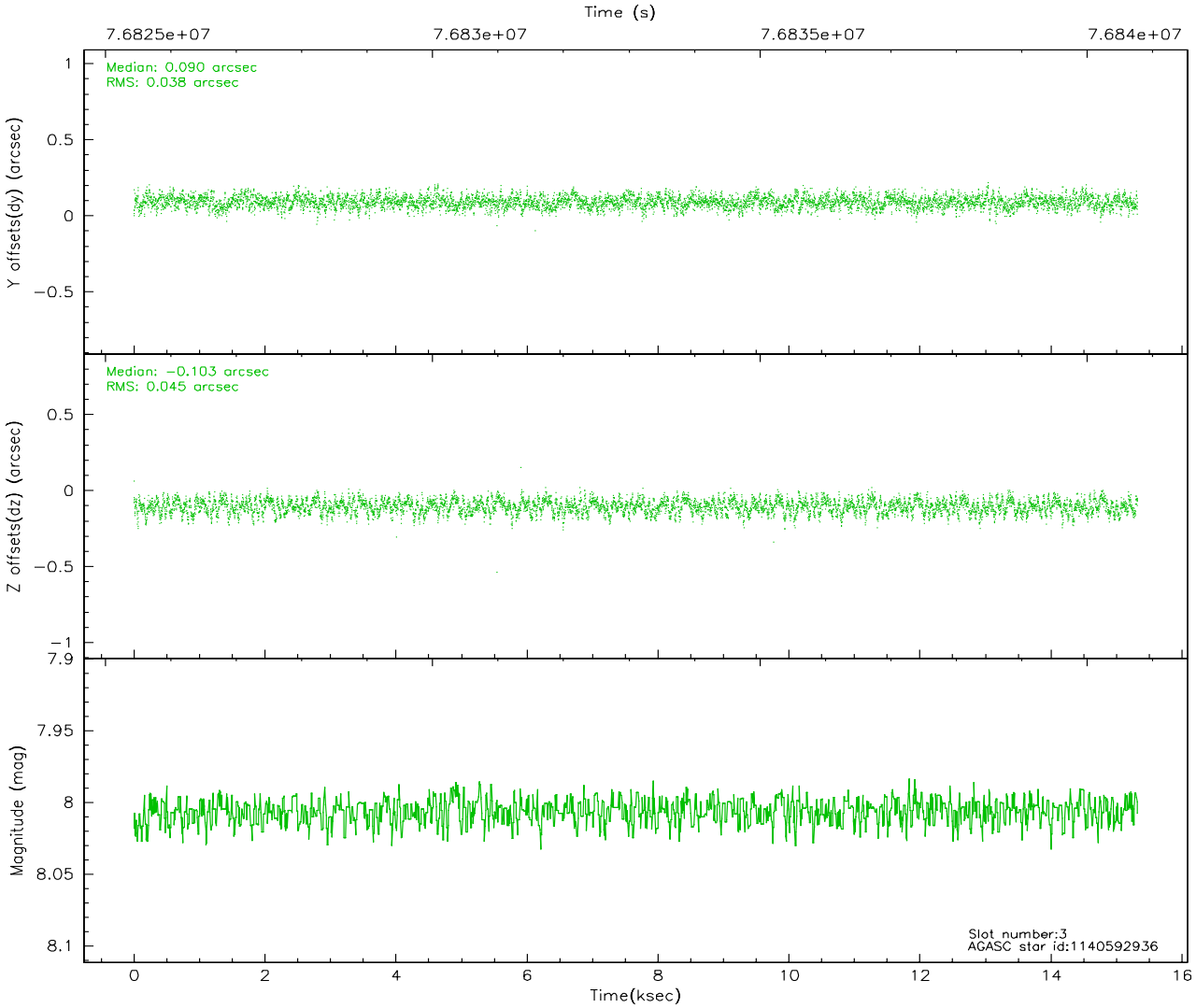
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-3	7.36	3737	-0.069	-0.013	0.007	0.012	0.000000	0.000000	59.09	-1970.08
1	FID	ACIS-S-4	7.19	3737	-0.003	0.043	0.006	0.009	0.000000	0.000000	2159.34	67.11
2	FID	ACIS-S-5	7.23	3738	0.044	-0.021	0.006	0.010	0.000000	0.000000	-1806.44	61.14
3	GUIDE	1140592936	8.01	7476	0.090	-0.103	0.062	0.101	228.953111	-57.013969	-2090.29	-1086.19
4	GUIDE	1140722888	8.11	7476	-0.126	0.063	0.057	0.097	230.457489	-57.599243	1500.49	-771.88
5	GUIDE	1140591736	8.62	7474	-0.167	0.004	0.078	0.122	228.676984	-57.228571	-1982.43	-2022.39
6	GUIDE	1140723280	8.82	7474	0.289	0.108	0.072	0.121	231.440595	-57.293670	2262.85	1291.18
7	GUIDE	1140729040	9.13	7471	-0.086	-0.073	0.095	0.151	231.193986	-56.778170	711.60	2418.58

2.4 Star Slots

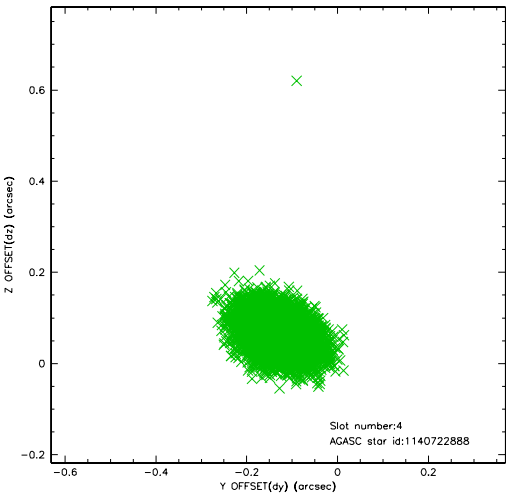
2.4.1 Slot 3

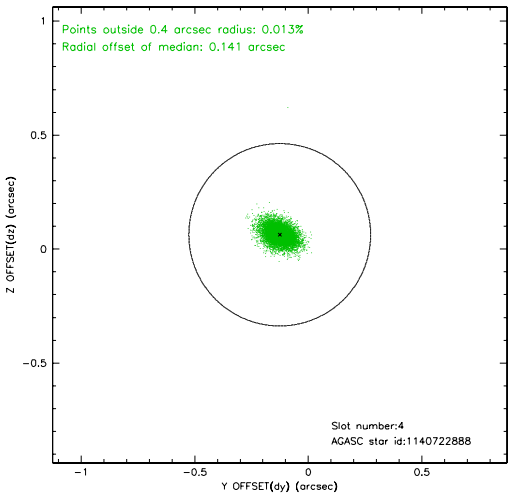


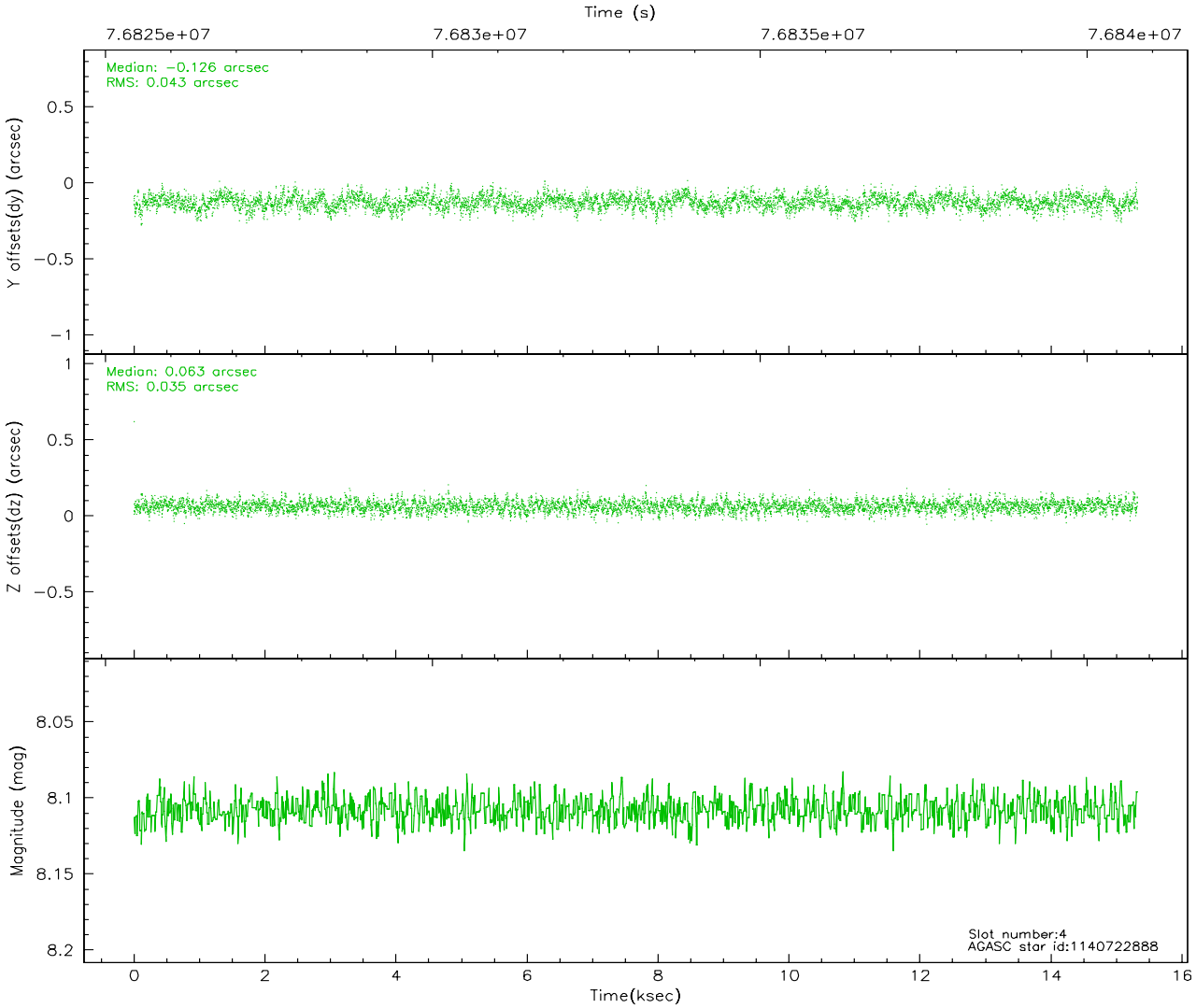




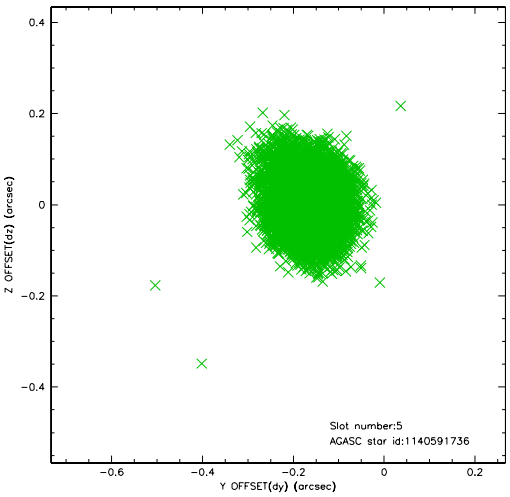
2.4.2 Slot 4

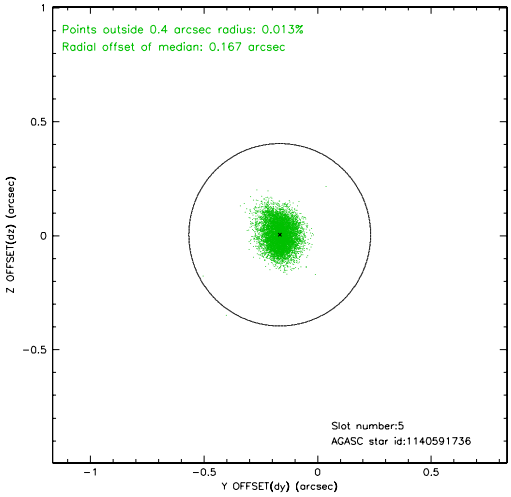

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1140722888

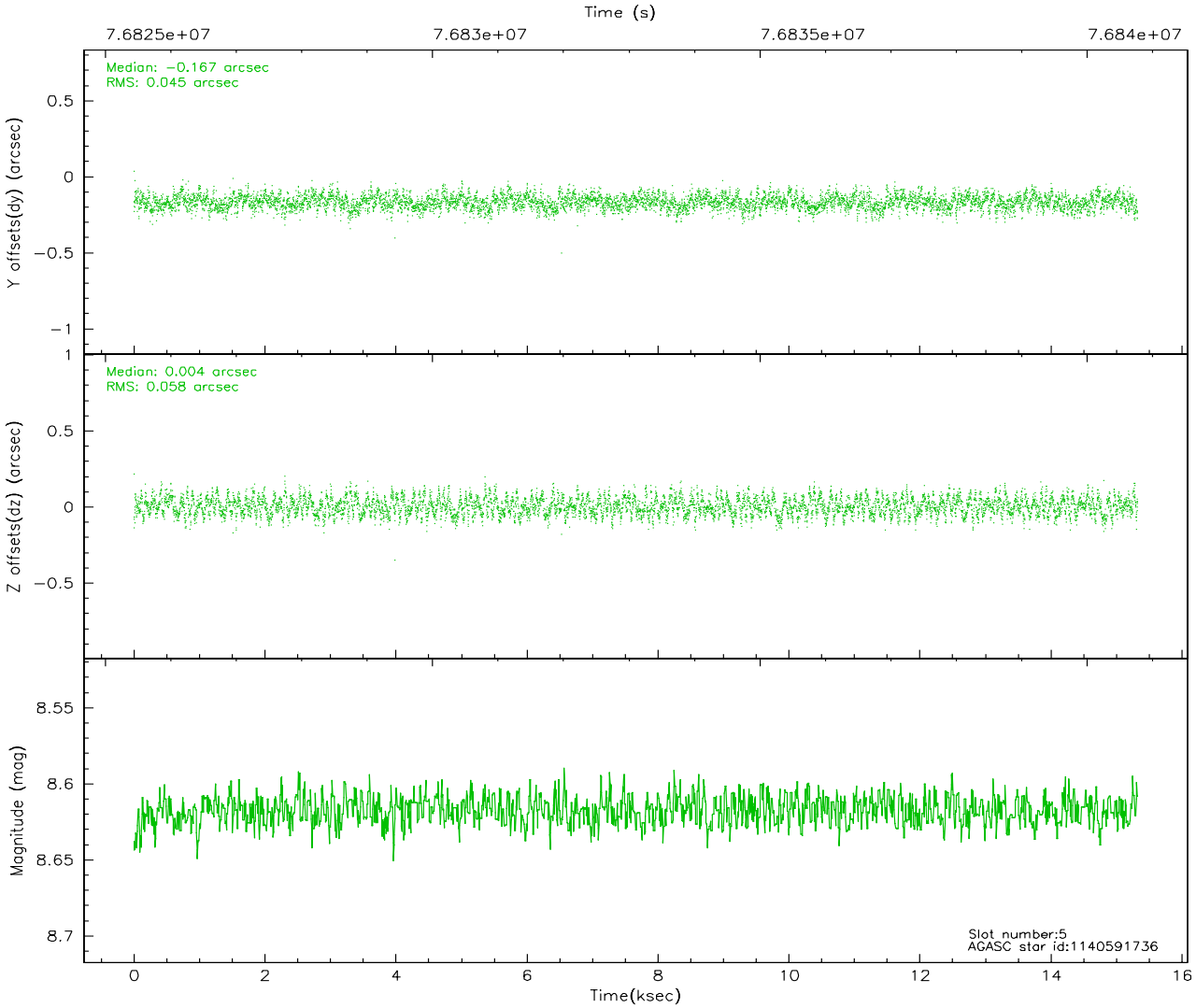

Points outside 0.4 arcsec radius: 0.013%
Radial offset of median: 0.141 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1140722888


Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: −0.126 arcsec
RMS: 0.043 arcsec
Y offsets(dy) (arcsec)
Median: 0.063 arcsec
RMS: 0.035 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:4
AGASC star id:1140722888
Time(ksec)

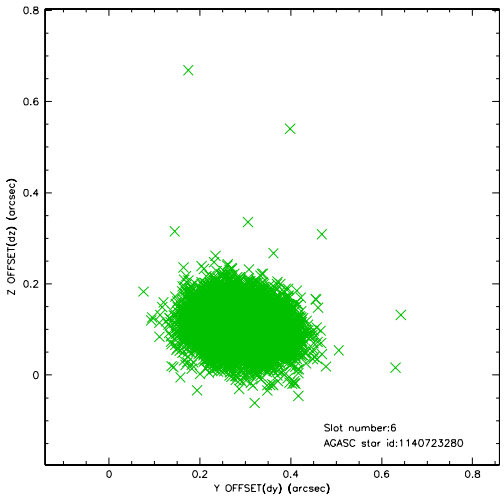
2.4.3 Slot 5

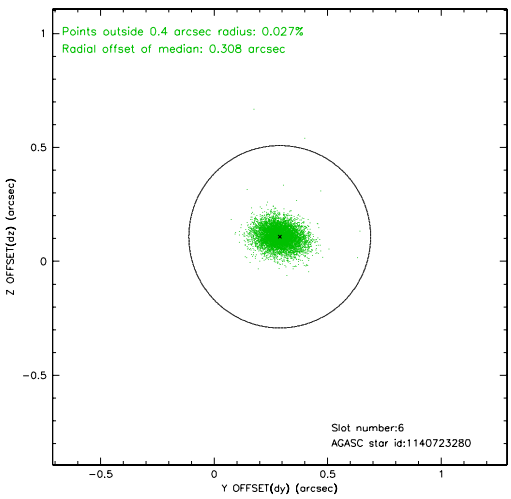

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1140591736

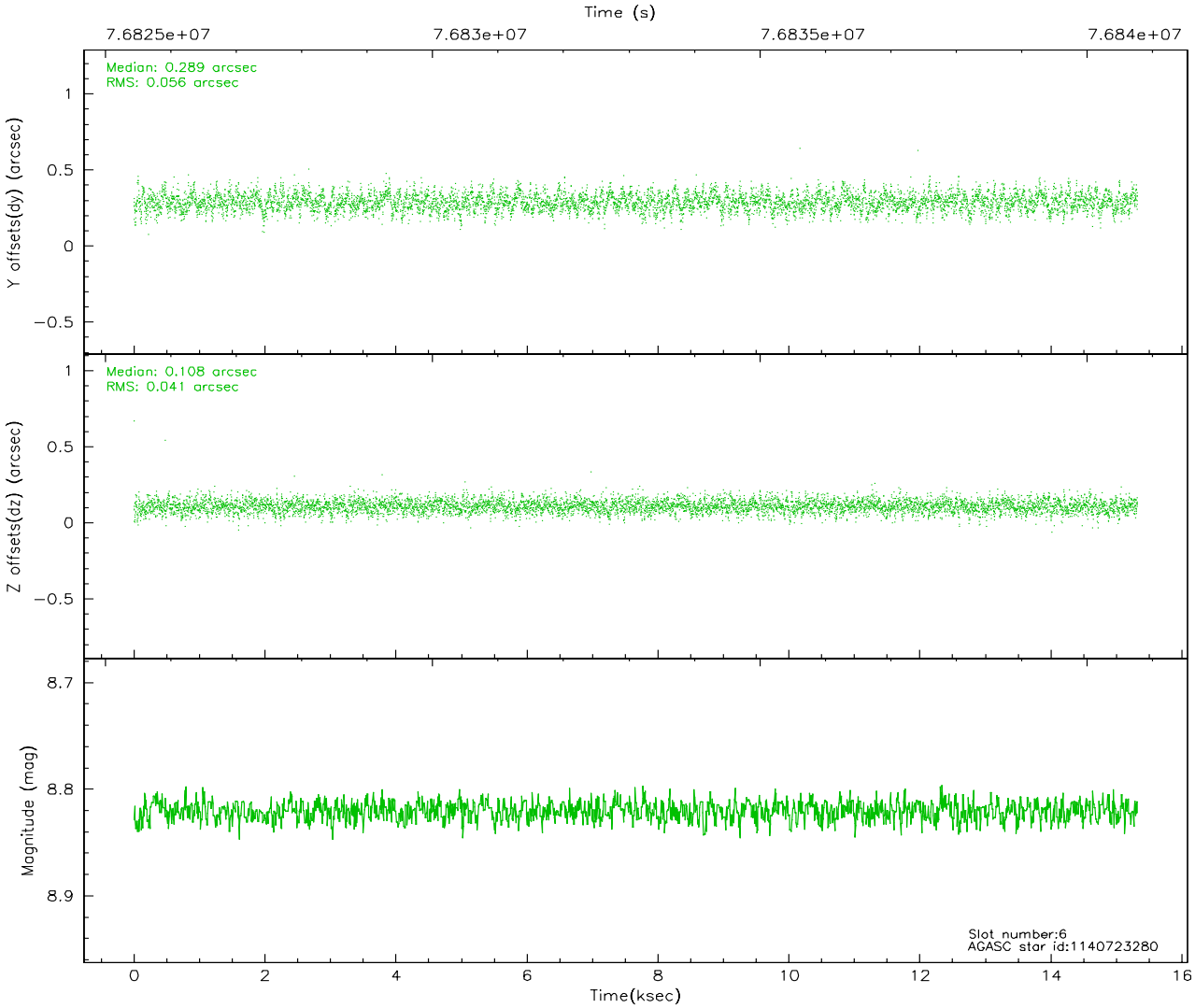

Points outside 0.4 arcsec radius: 0.013%
Radial offset of median: 0.167 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1140591736


Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: −0.167 arcsec
RMS: 0.045 arcsec
Y offsets(dy) (arcsec)
Median: 0.004 arcsec
RMS: 0.058 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:5
AGASC star id:1140591736
Time(ksec)

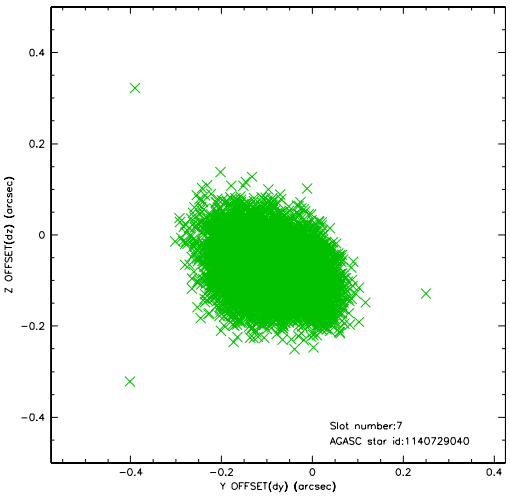
2.4.4 Slot 6

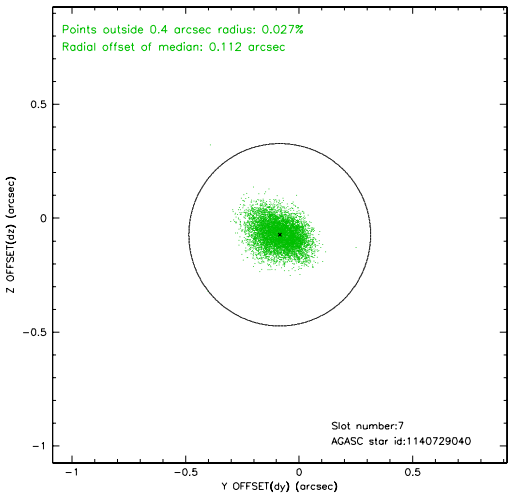

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1140723280

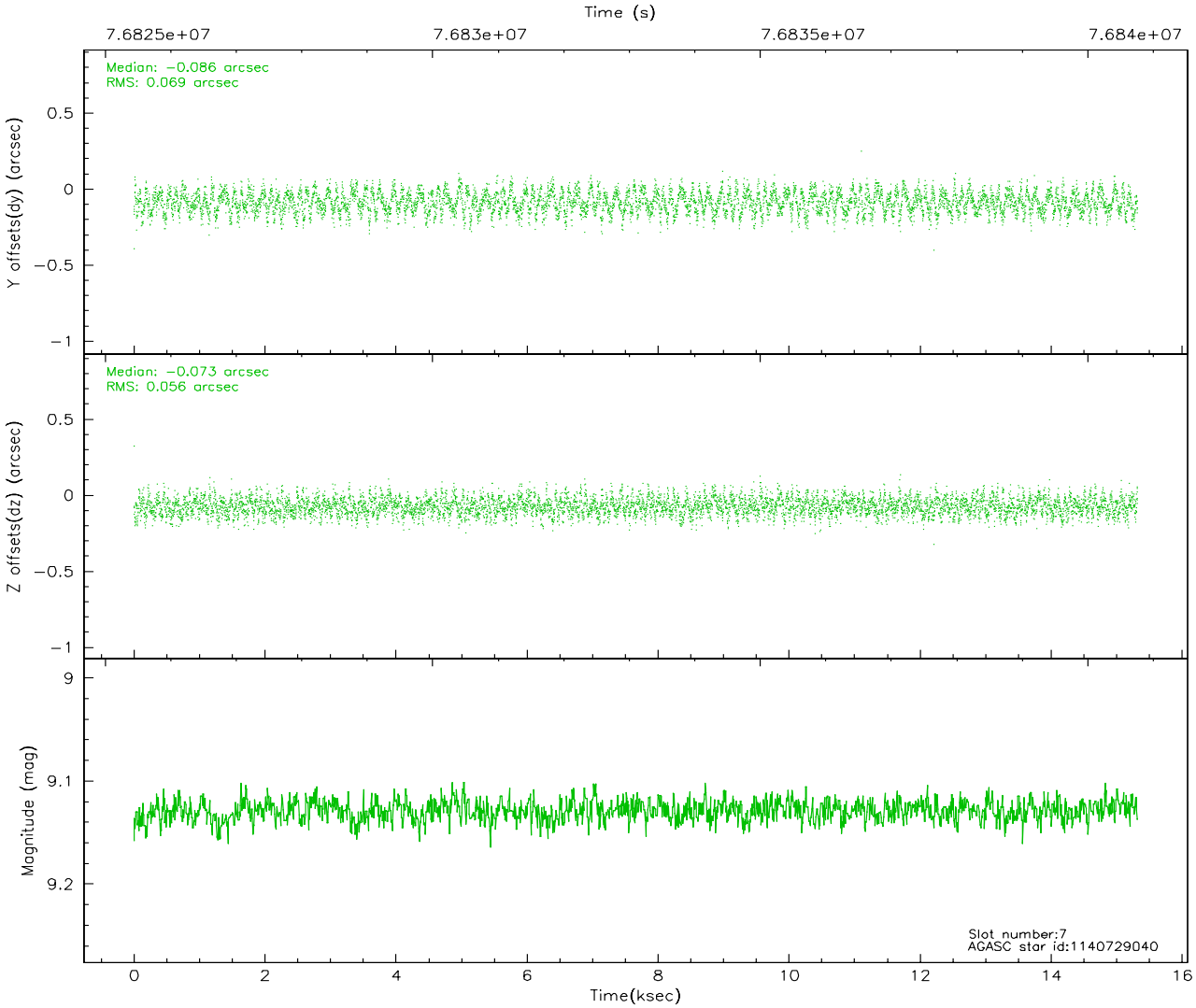

Points outside 0.4 arcsec radius: 0.027%
Radial offset of median: 0.308 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1140723280


Time (s)
Median: 0.289 arcsec
RMS: 0.056 arcsec
Y offsets(dy) (arcsec)
Median: 0.108 arcsec
RMS: 0.041 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:6
AGASC star id:1140723280
Time(ksec)

2.4.5 Slot 7

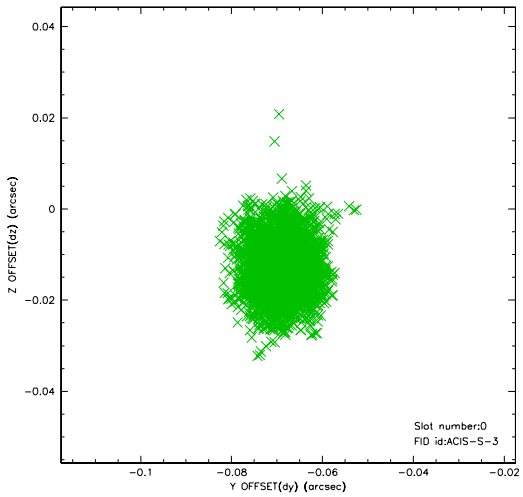

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1140729040

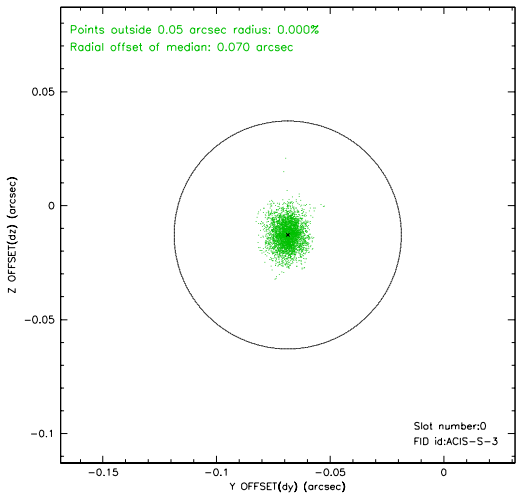

Points outside 0.4 arcsec radius: 0.027%
Radial offset of median: 0.112 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1140729040

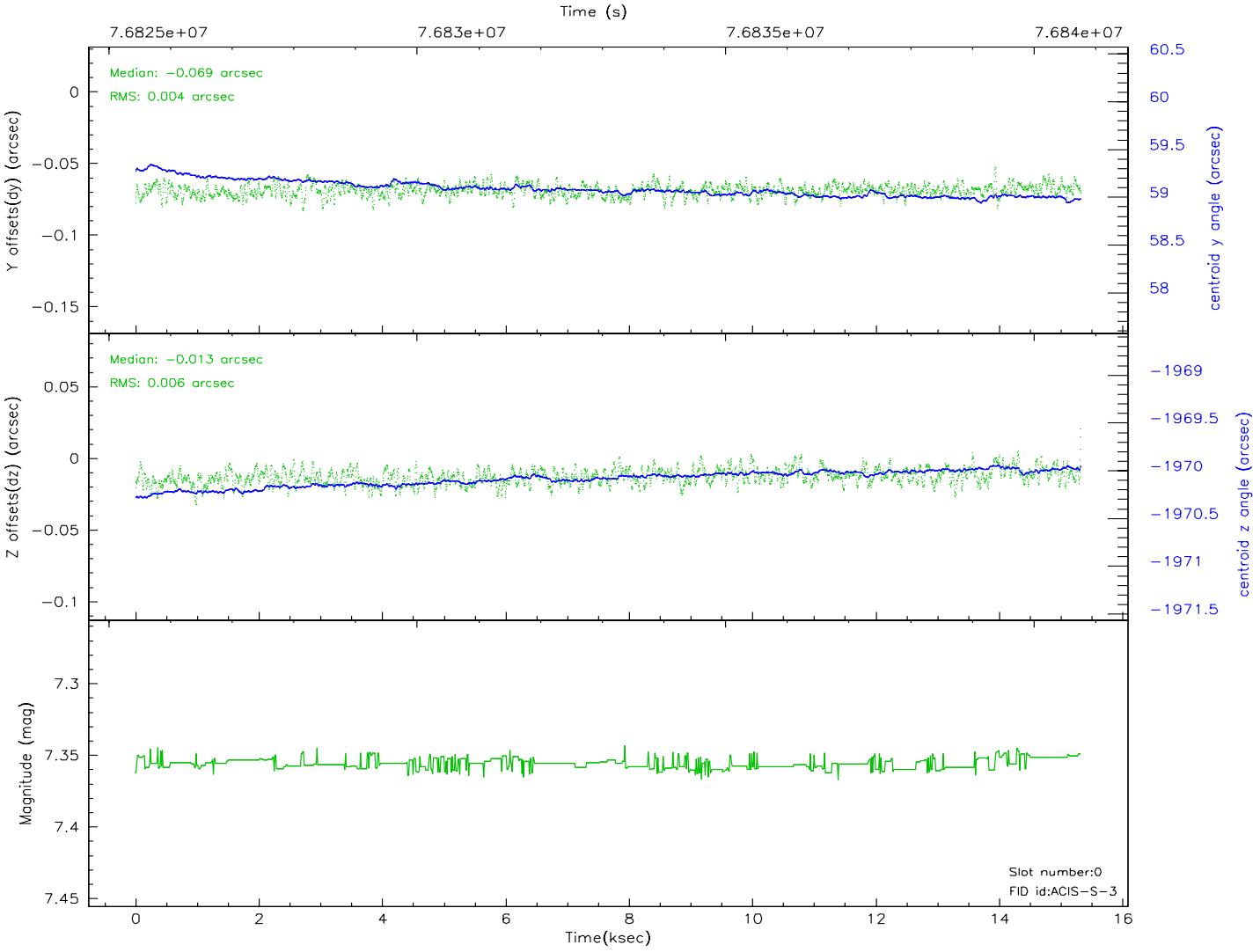

Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: −0.086 arcsec
RMS: 0.069 arcsec
Y offsets(dy) (arcsec)
Median: −0.073 arcsec
RMS: 0.056 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:7
AGASC star id:1140729040
Time(ksec)

2.5 FID Slots

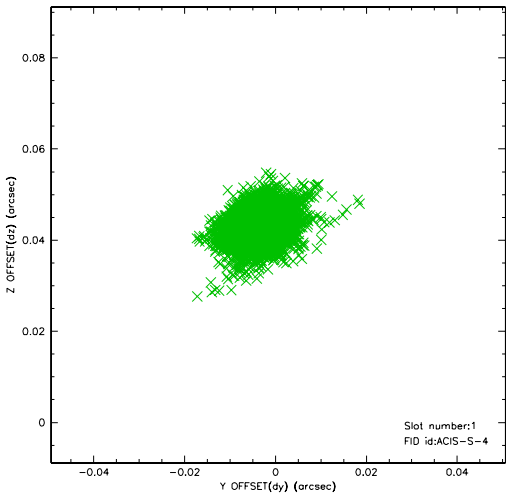
2.5.1 Slot 0

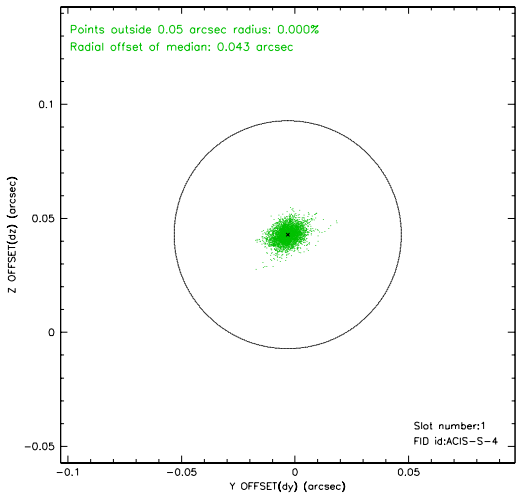


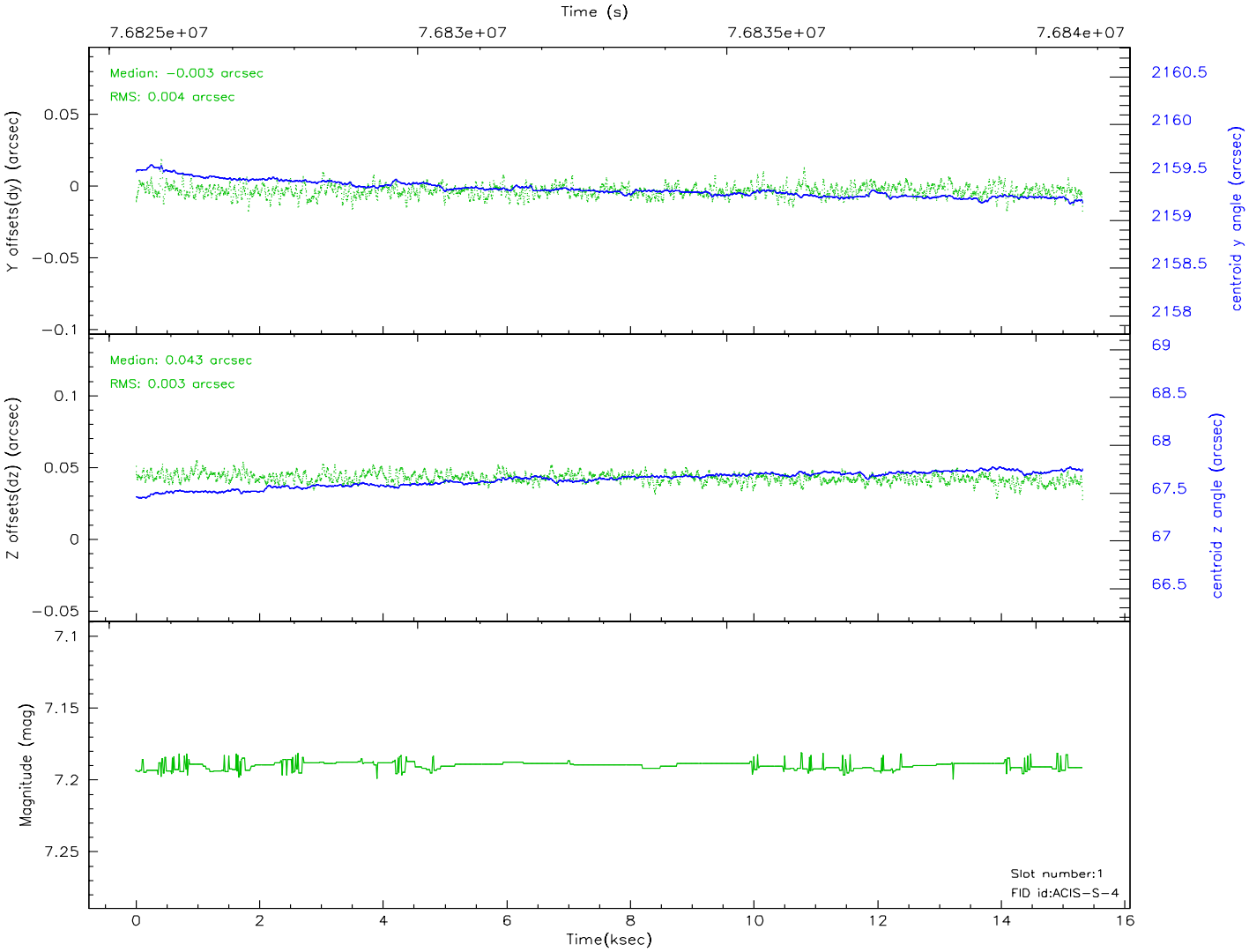




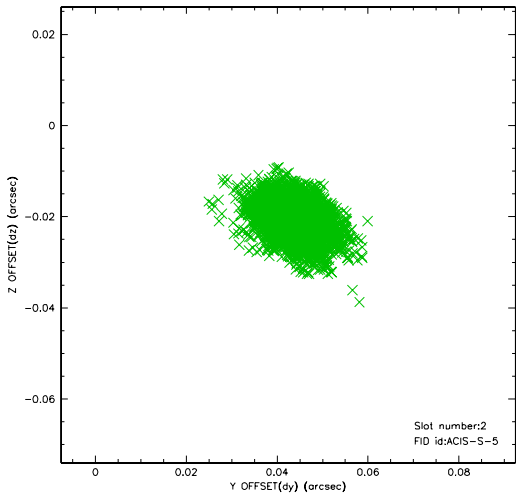
2.5.2 Slot 1

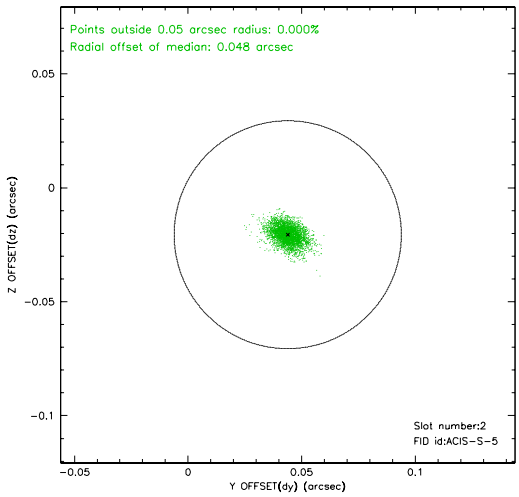

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4

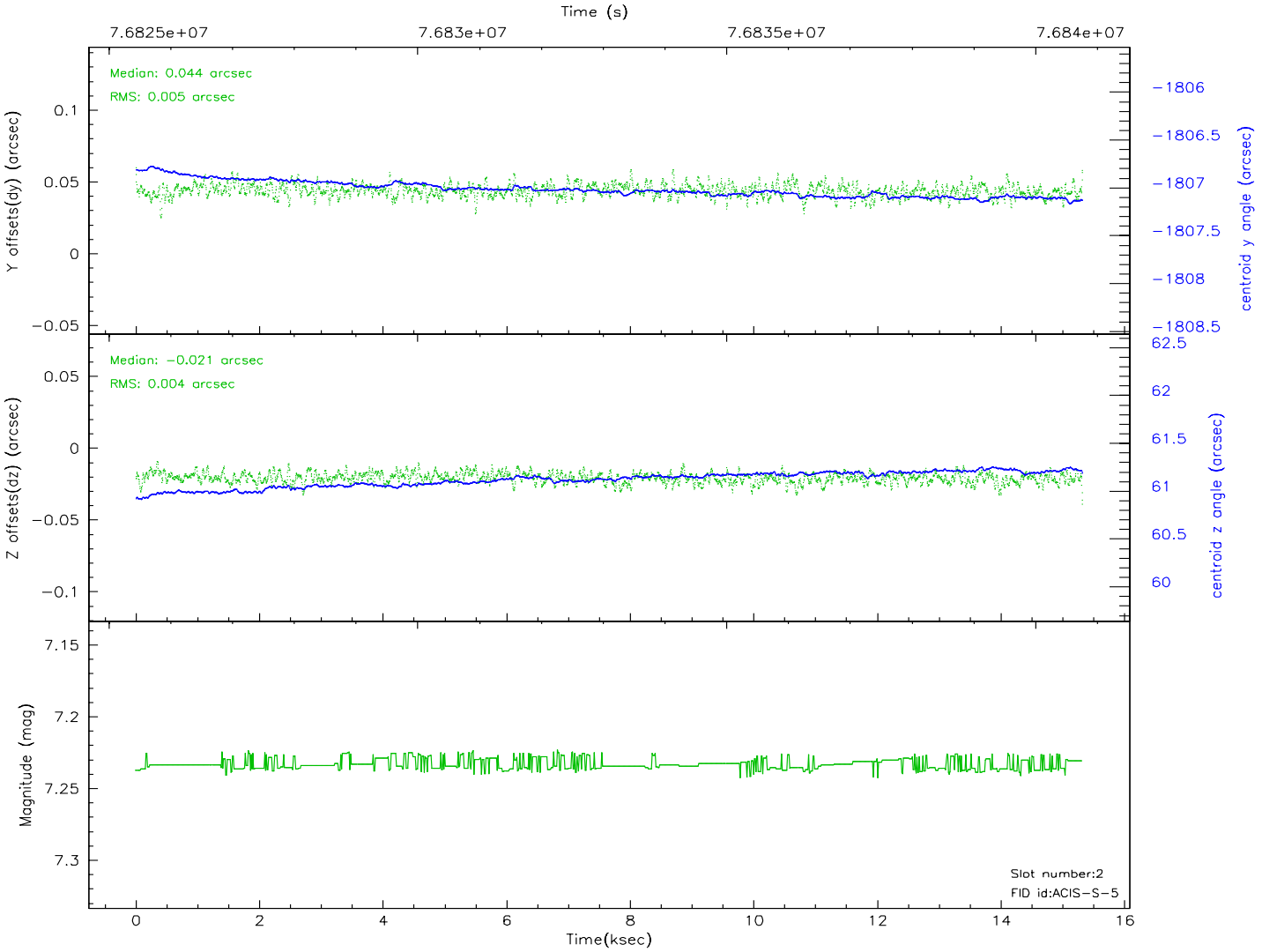

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.043 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4


Time (s)
Median: −0.003 arcsec
RMS: 0.004 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.043 arcsec
RMS: 0.003 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

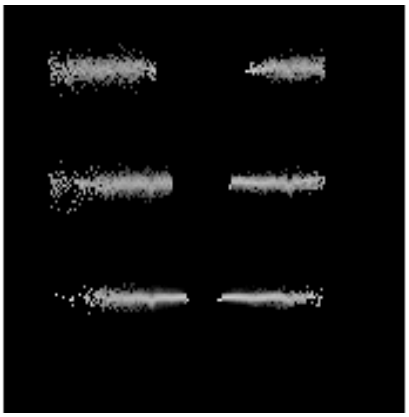

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.048 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5

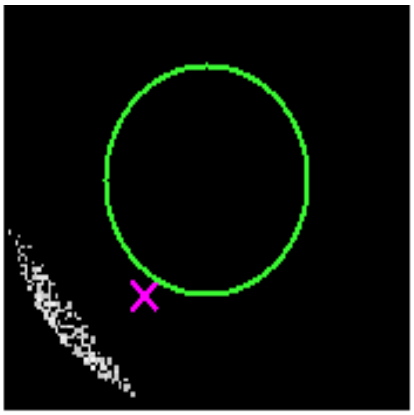

Time (s)
7.6825e+07
7.683e+07
7.6835e+07
7.684e+07
Median: 0.044 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: −0.021 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:2
FID id:ACIS-S-5
Time(ksec)

3 Gratings

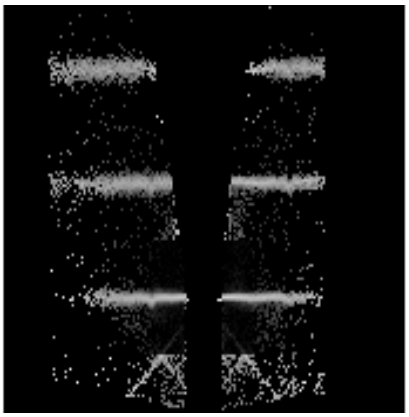
3.1 HEG Arm



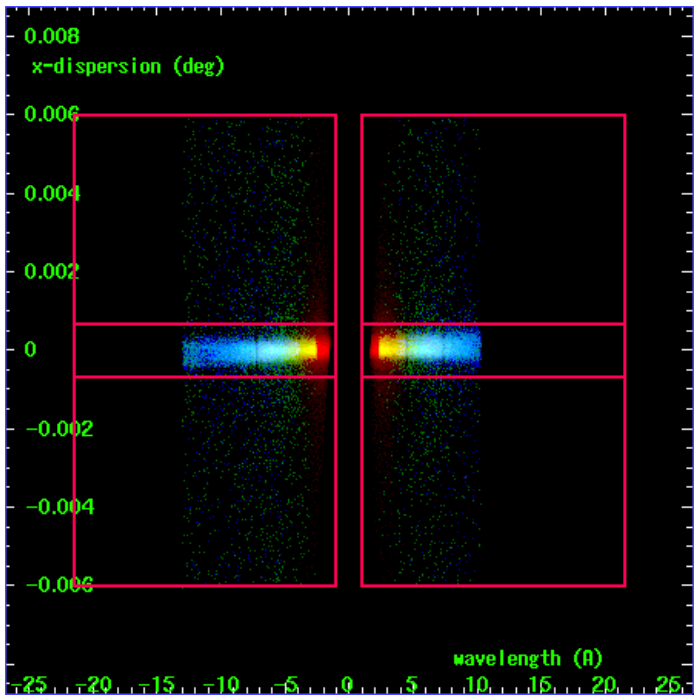
HEG Order Sort 123



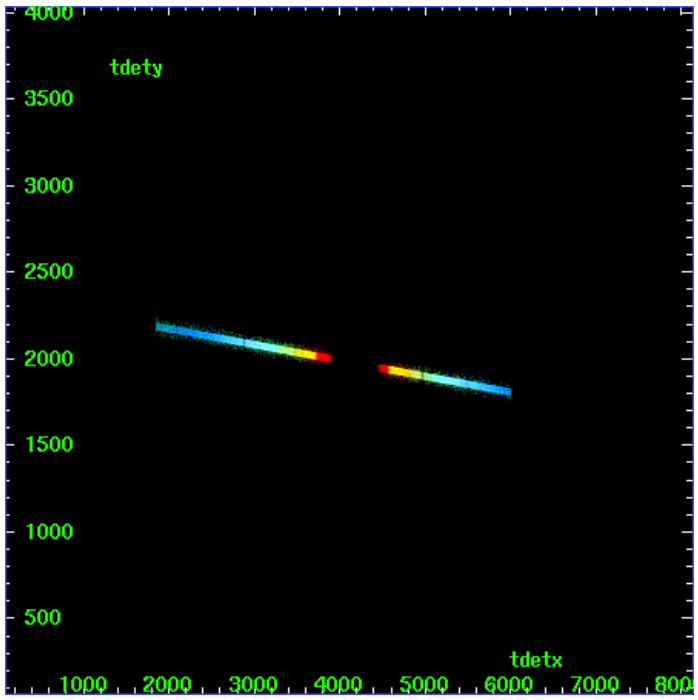
HEG Zero Order



HEG Order Sort ALL

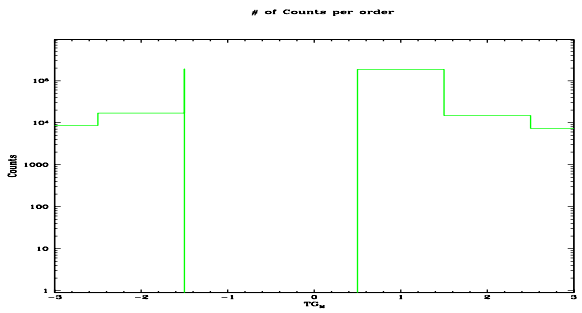


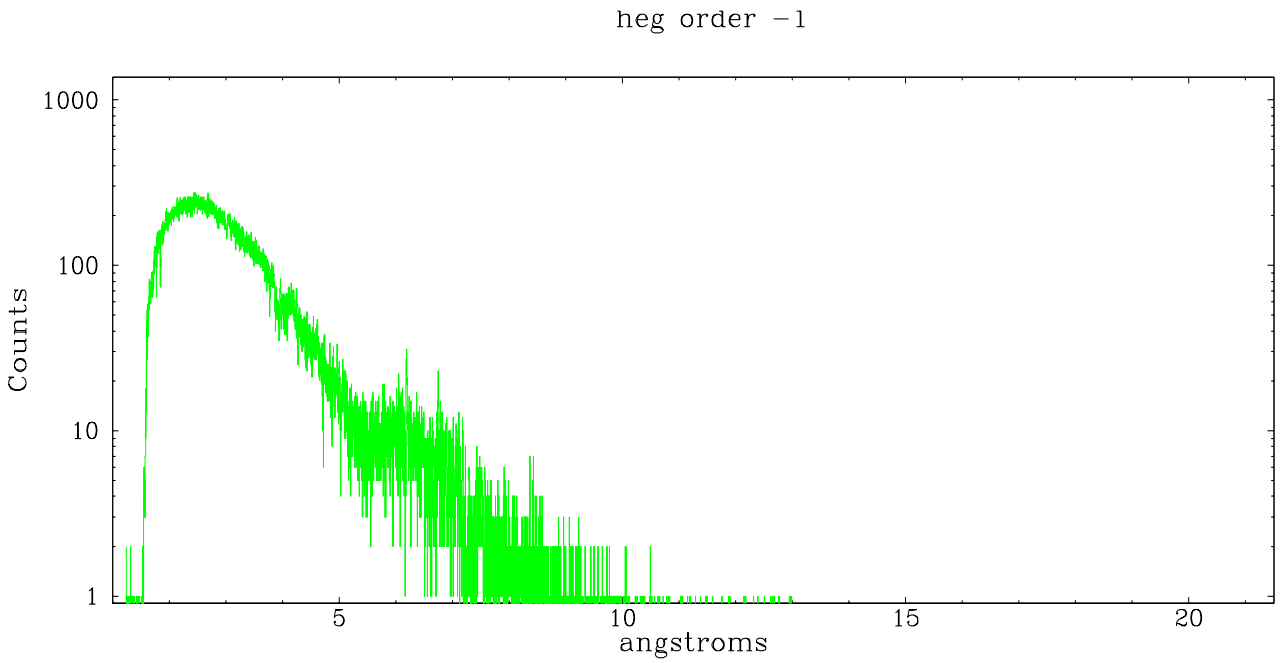
Spot Image HEG

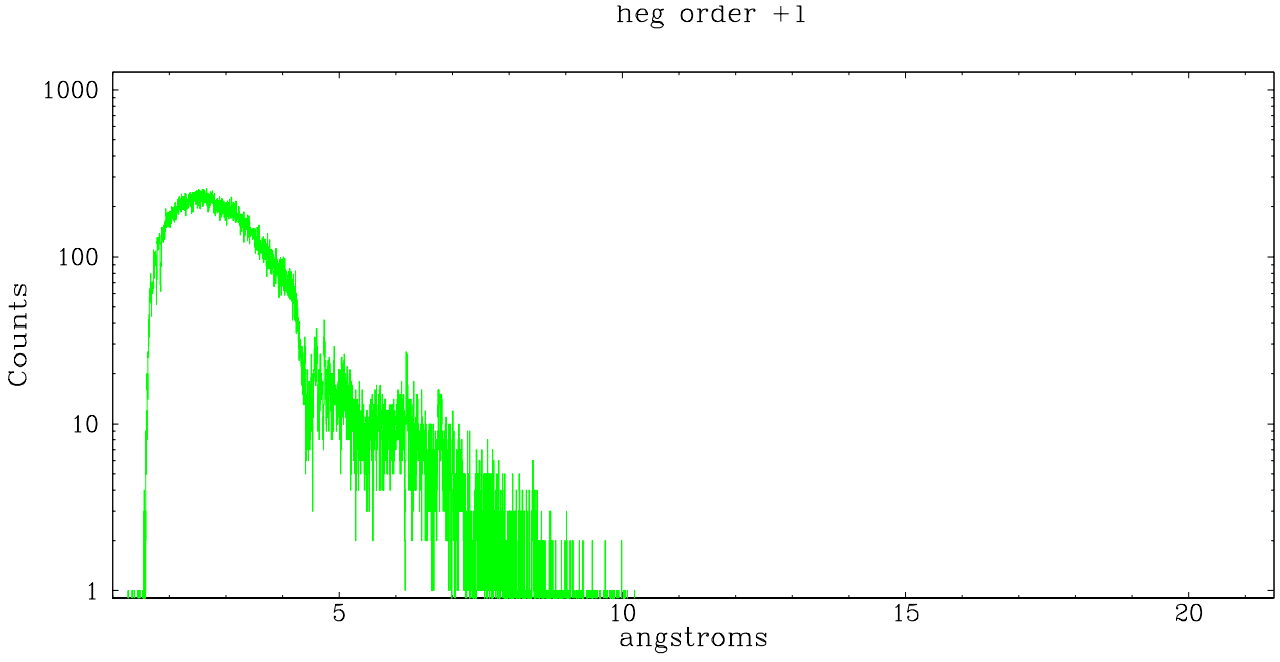


Full Detector HEG

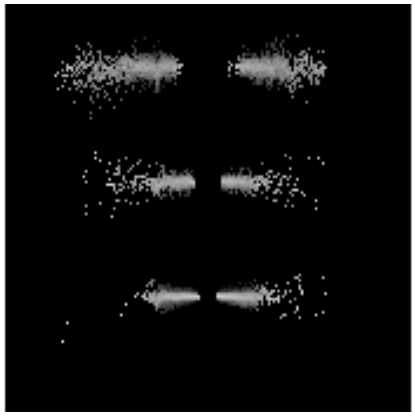
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	8623	16992	190154	0	185627	14901	7302



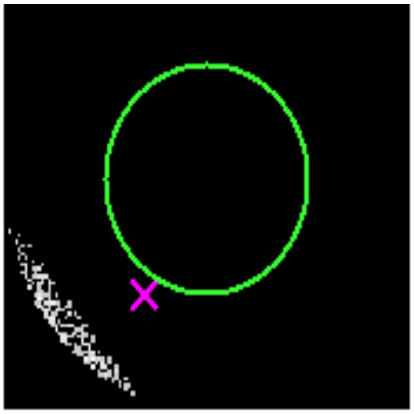

heg order −1
1000
100
10
1
Counts
5
10
15
20
angstroms


heg order +1
1000
100
10
1
Counts
5
10
15
20
angstroms

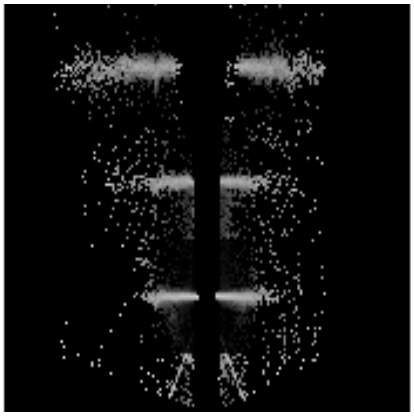
3.2 MEG Arm



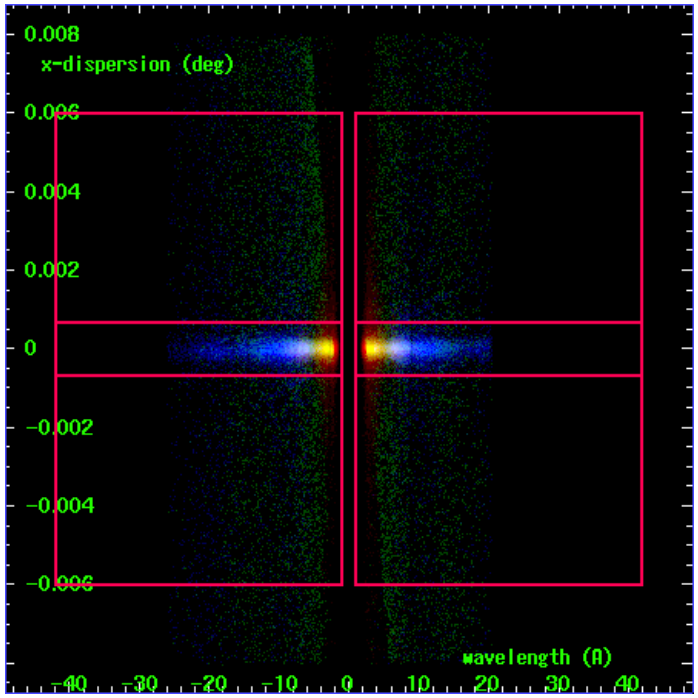
MEG Order Sort 123



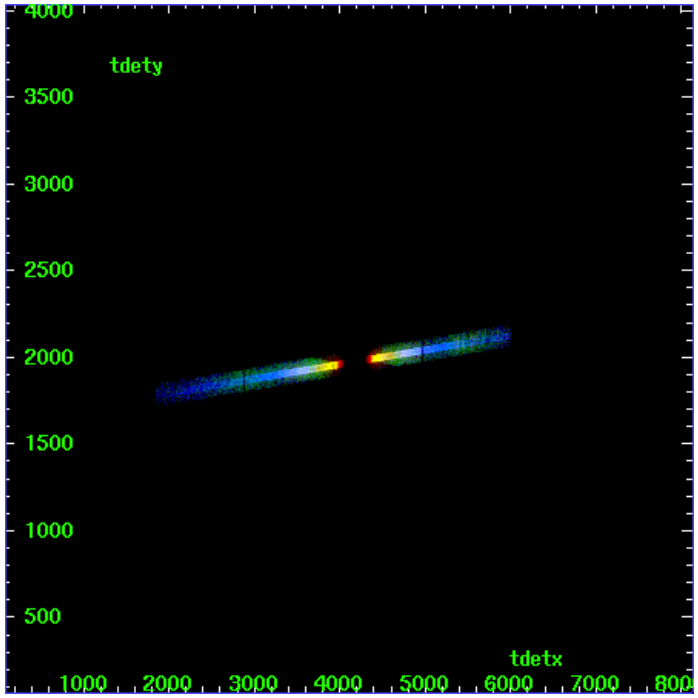
MEG Zero Order



MEG Order Sort ALL

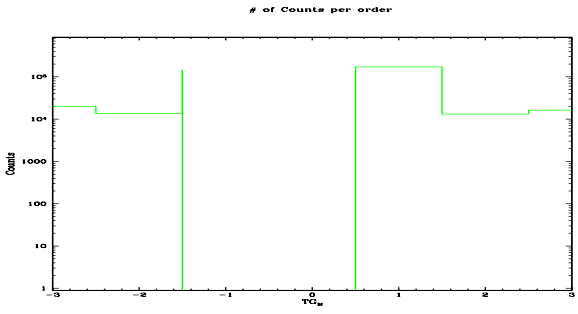


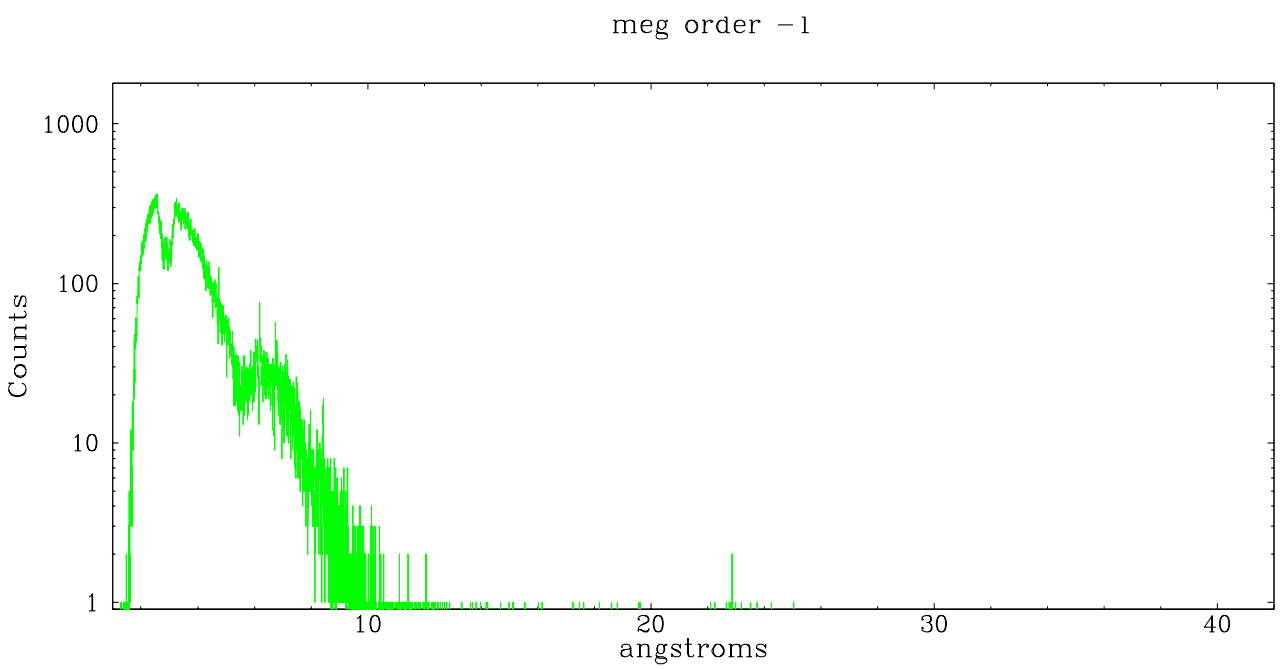
Spot Image MEG

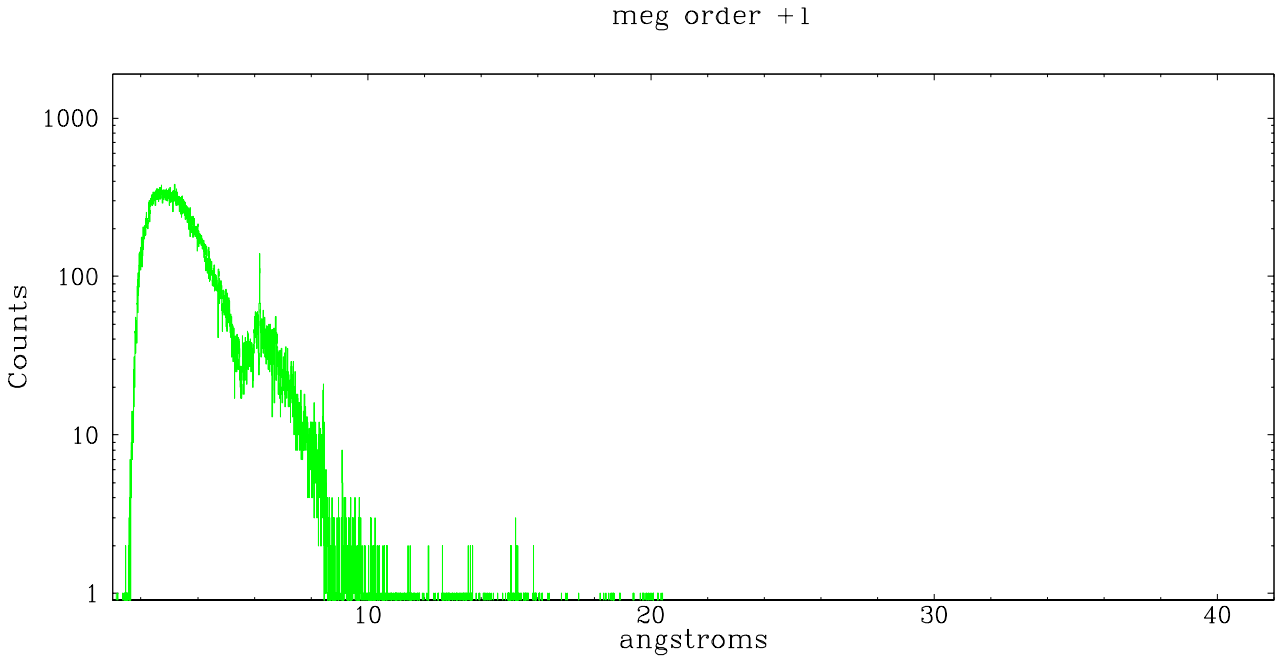


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	20190	13544	143027	0	171727	13072	16327




meg order −1
1000
100
10
1
Counts
10
20
30
40
angstroms


meg order +1
1000
100
10
1
Counts
10
20
30
40
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2007.08.01
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	15.322

A.2 Comments

Standard data processing software did not correctly
locate the zeroth order because a spatial exclusion window was used to block the
zeroth order image. Manual intervention was used
to input the correct sky coordinates (x=4114.77, y=4126.60) into the
*src1a.fits file table. These corrected coordinates were determined using
a software tool developed by CXC called findzero, which is expected to be
released in CIAO (currently in ISIS). The tool calculates the point of intersection of the
readout streak and the meg arm (preferred position), or the readout streak
and the heg arm. The zeroth order source position determined by the standard
pipeline processing using the tool tgdetect was not used in this processing. The newly determined
zeroth order coordinates have been placed in the *src1a.fits file,
replacing the coordinates determined by tgdetect. Note that these
corrected coordinates of the zeroth order cannot be reproduced by running
tgdetect on the data. Both the meg and heg spectral arms are piled up.======
Destreaking algorithm run on level 1 data in the pipeline was not completely
effective. Data may benefit from running the destreak tool again on level 2
data.