V&V Reference Report
L2 ASCDS Version : 7.6.9

Observation 1927 - L2 Version 001
Chandra X-Ray Center

L2 Processing Date : Dec 8 2006

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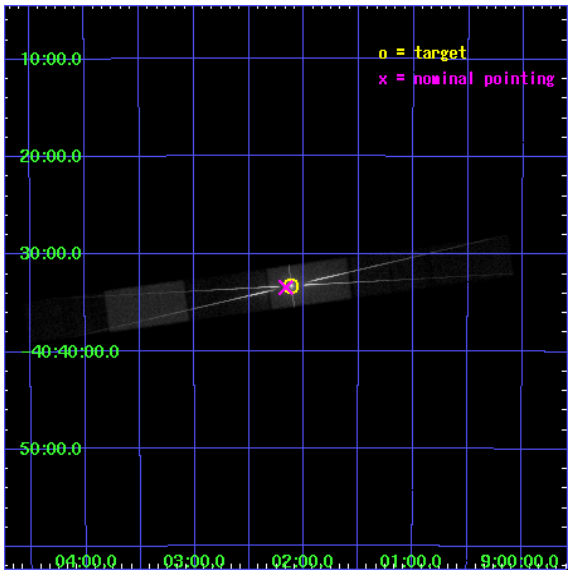
1 Front

seq_num	400140
obs_id	1927
title	DYNAMICS OF THE IONIZED STELLAR WIND IN VELA X-1
observer	PROF. STEVEN KAHN
object	VELA X-1
dtycycle	0
cycle	P
ra_targ	135.52875
dec_targ	-40.554694
ra_nom	135.54102096121
dec_nom	-40.55774886764
roll_nom	352.16469858626
revision	2
ontime	30140.959032744
livetime	29430.472795378
ontime4	30142.700052842
ontime5	30142.700052842
ontime6	30140.959062666
ontime7	30140.959032744
ontime8	30140.959032744
ontime9	30140.959062666
l2events	470302

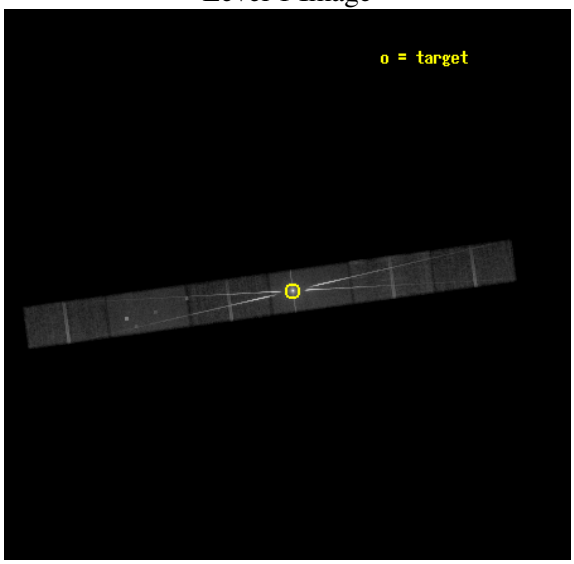


2 OBI

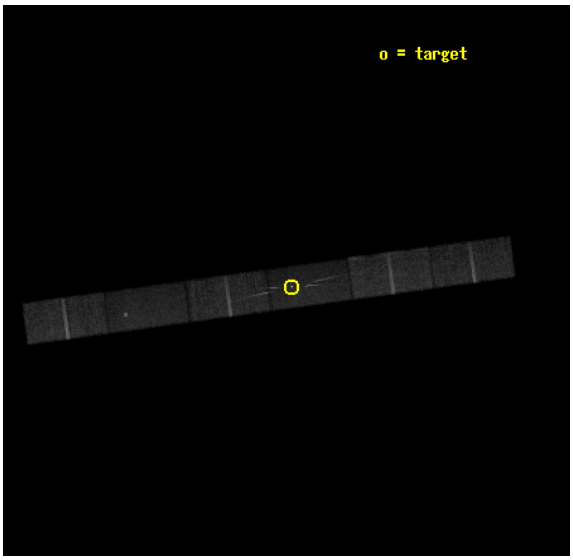
2.1 OBI

2.1.1 Images

Level 1 Image

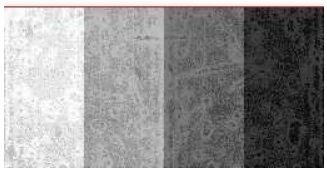


Level 1 Bad Events

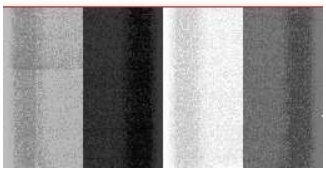


2.1.2 Bias

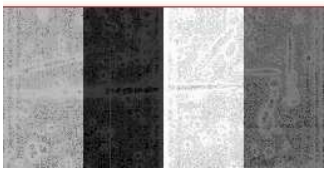
Chip 4



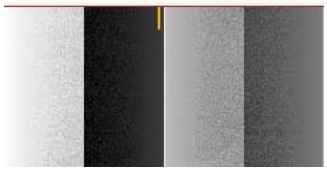
Chip 5



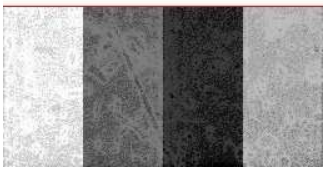
Chip 6



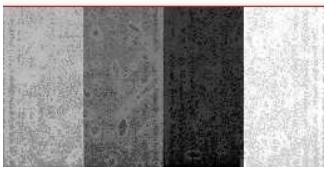
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0
ascdsver	7.6.9
caldbver	3.2.3
date	2006-11-06T15:49:56
revision	2

sched_exp_time	30000.000000
ontime	30758.571634978
ontime4	30664.558356047
ontime5	30760.312655076
ontime6	30690.671104893
ontime7	30758.571634978
ontime8	30708.081474975
ontime9	30702.858384892
l1events	1074592

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	118299	146628	200603	351022	153375	104665
rejected events	105406	79540	96520	87780	109719	90030
rejected %	89%	54%	48%	25%	71%	86%

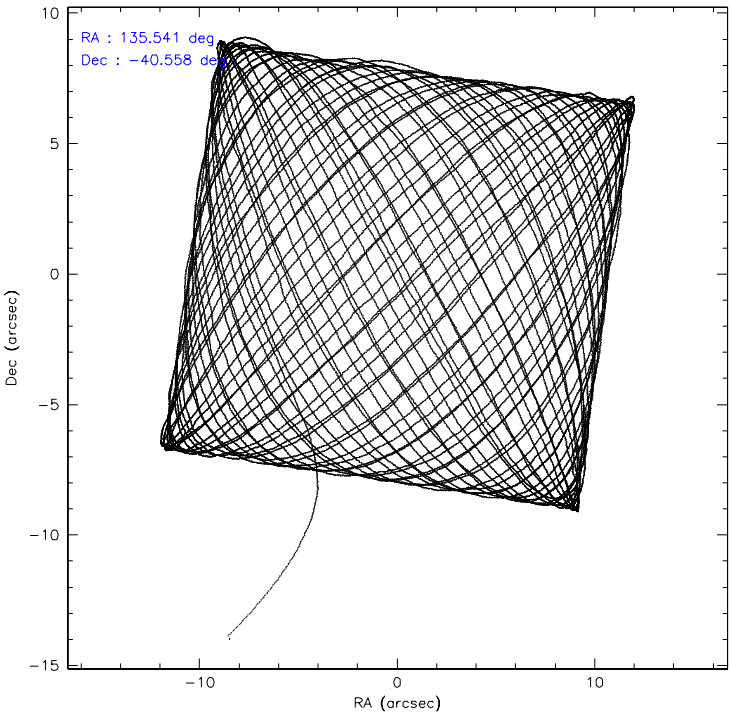
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	6052	7059	61148	45466	20390	6674
	5%	4%	30%	12%	13%	6%
grade 1 events	51	134	499	797	103	45
	0%	0%	0%	0%	0%	0%
grade 2 events	2923	21542	17151	66121	8049	2645
	2%	14%	8%	18%	5%	2%
grade 3 events	1481	3515	6662	22646	3732	1629
	1%	2%	3%	6%	2%	1%
grade 4 events	1496	2472	6732	22503	3596	1626
	1%	1%	3%	6%	2%	1%
grade 5 events	3369	8745	4557	13308	5046	4060
	2%	5%	2%	3%	3%	3%
grade 6 events	2199	34985	13680	109633	8527	2290
	1%	23%	6%	31%	5%	2%
grade 7 events	100728	68176	90174	70548	103932	85696
	85%	46%	44%	20%	67%	81%

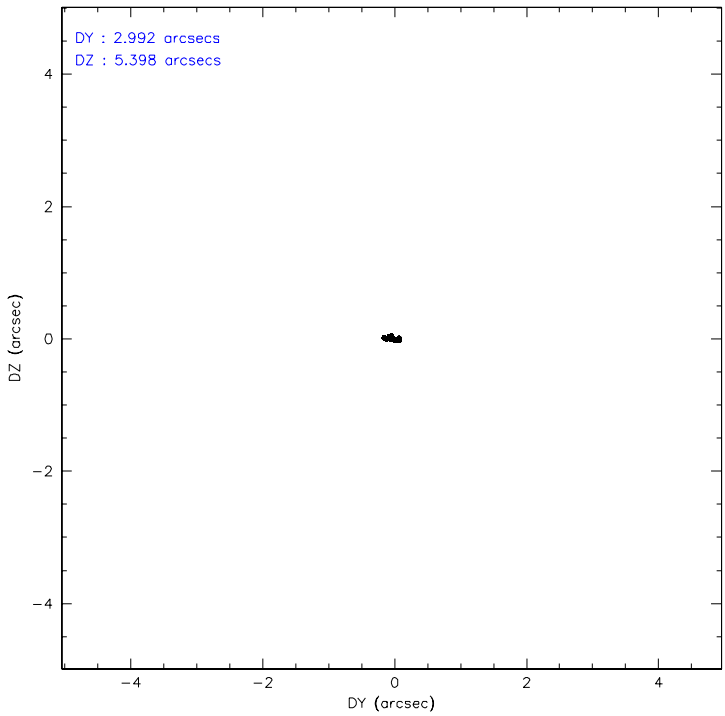
2.2 Compared Parameters

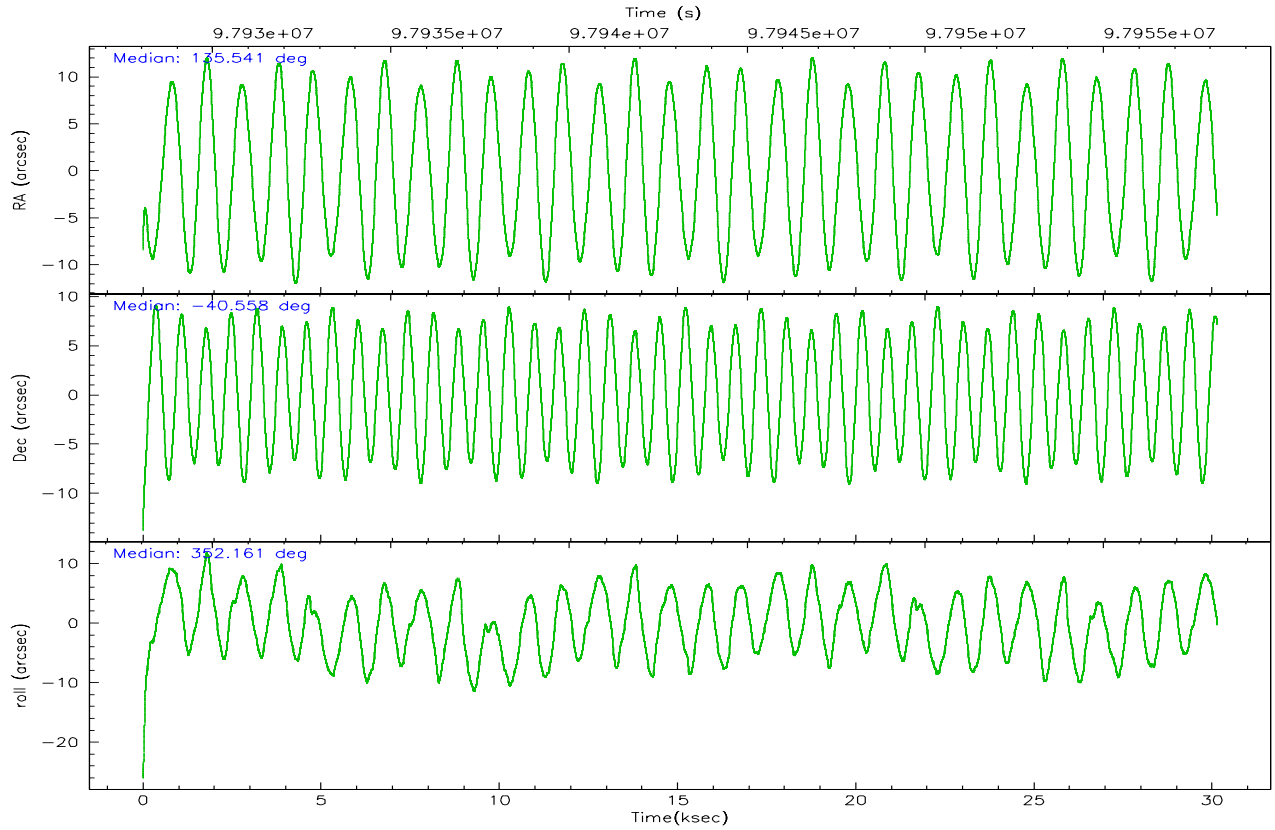
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
Pointing RA	135.507851	135.5410209612091
Pointing Dec	-40.568285	-40.55774886763997
Pointing Roll	351.986511	352.1646985862611
SIM focus pos (mm)	-0.684267	-0.6828225247311905
SIM defocus (mm)	0	0.001444936568705701
SIM translation stage pos (mm)	-184.032523	-184.0277655517795
SIM translation stage offset (mm)	-6.1	-6.104757031228274
Phase constraints	Y	Y
Phase period	8.964416	8.964416
Phase epoch	50132.313800	50132.313800
Phase start	0.480000	0.480000
Phase end	0.520000	0.520000
Phase start error	0.010000	0.010000
Phase end error	0.010000	0.010000
Observation start time	97928195.184000	97927037.138004
Observation start date	2001-02-07T10:15:31	2001-02-07T09:57:17
Observation end time	97958195.184000	97958996.126735
Observation end date	2001-02-07T18:35:31	2001-02-07T18:49:56
Read mode	TIMED	TIMED

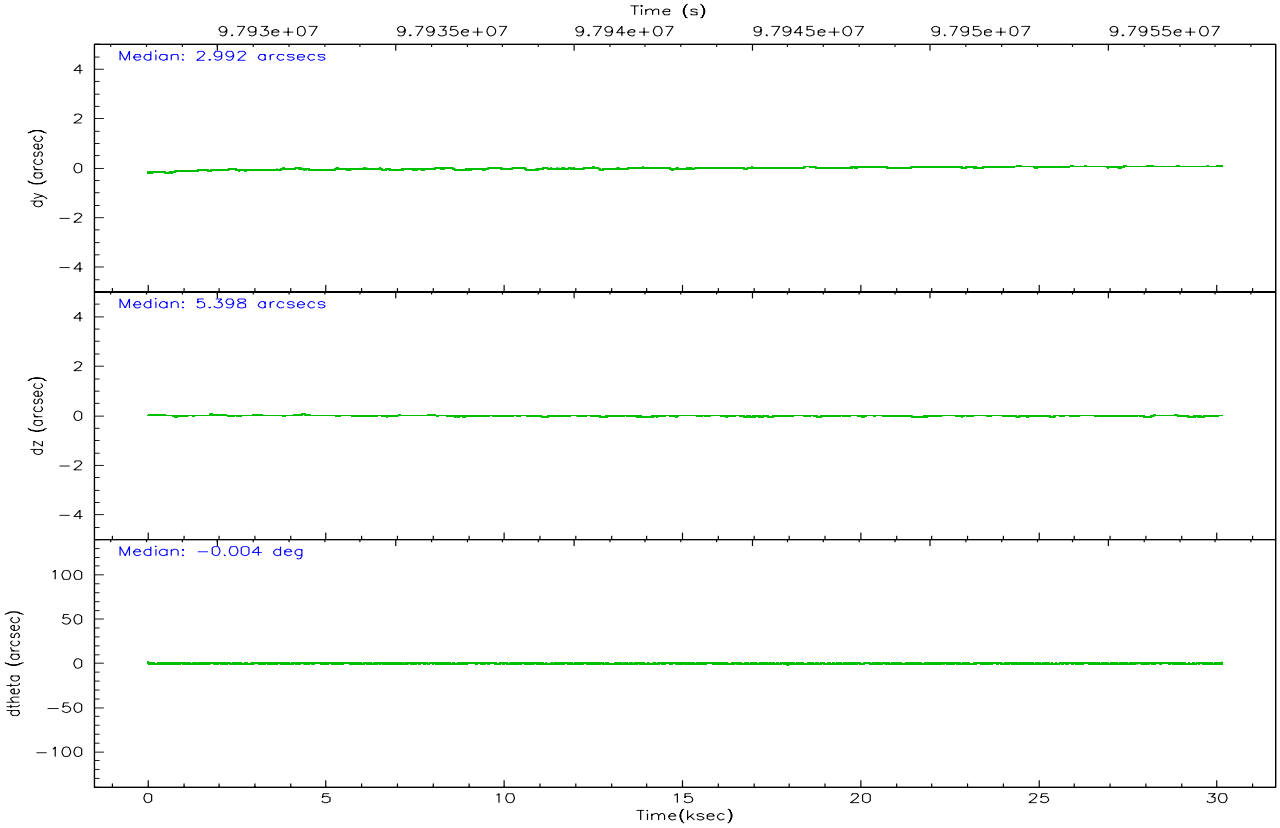
Parameter	Planned	Actual
Obspar format version number	6	6
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	1/2
Subarray start row	1	1
Subarray row count	512	512
Alternating exposures requested	N	N
Primary exposure time	0.000000	1.7

2.3 Aspect


RA : 135.541 deg
Dec : −40.558 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−15
−10
0
10


DY : 2.992 arcsecs
DZ : 5.398 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: 135.541 deg
RA (arcsec)
Median: −40.558 deg
Dec (arcsec)
Median: 352.161 deg
roll (arcsec)
Time(ksec)

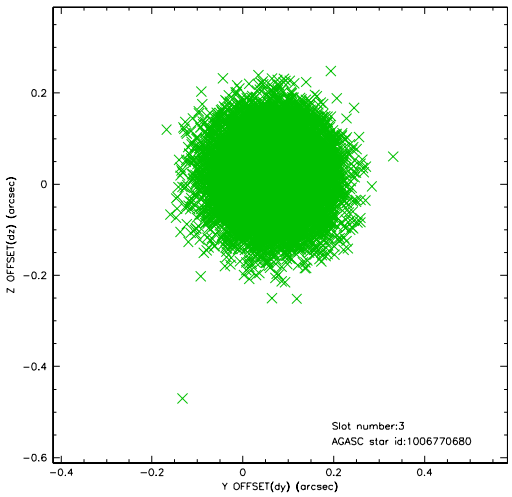

Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: 2.992 arcsecs
dy (arcsec)
Median: 5.398 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

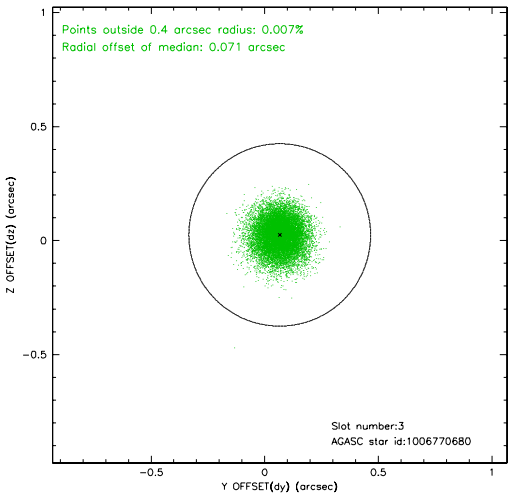
Slot Statistics

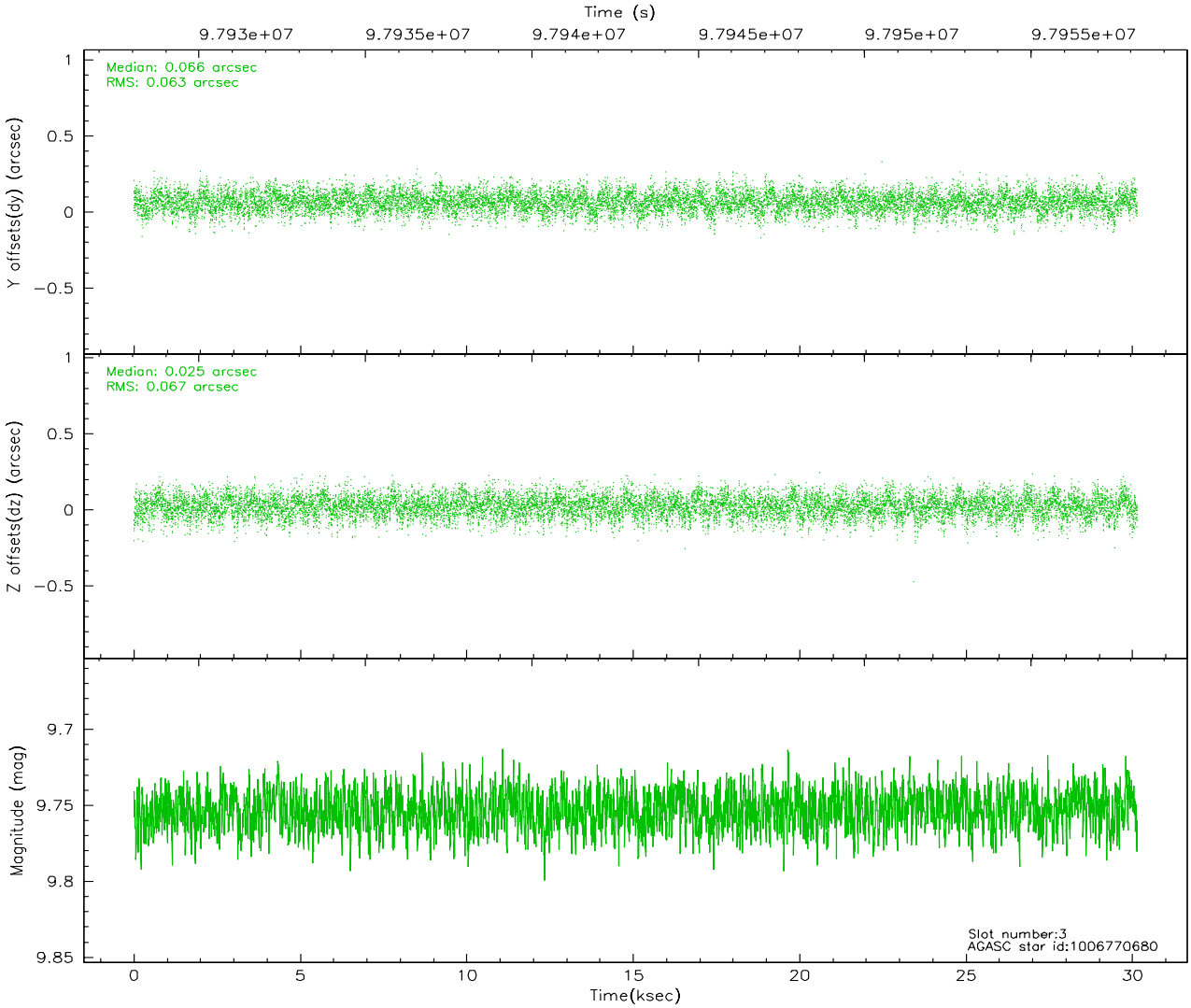
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.09	7353	-0.029	-0.035	0.007	0.011	0.000000	0.000000	-755.24	-1852.38
1	FID	ACIS-S-4	7.19	7351	-0.071	0.023	0.005	0.010	0.000000	0.000000	2157.98	56.04
2	FID	ACIS-S-5	7.23	7351	0.069	0.020	0.006	0.011	0.000000	0.000000	-1807.88	49.82
3	GUIDE	1006770680	9.75	14566	0.066	0.025	0.098	0.158	136.066277	-40.835914	1641.25	-746.93
4	GUIDE	1006774288	9.43	14625	-0.185	-0.151	0.117	0.188	136.151715	-40.161117	1550.55	1691.67
5	GUIDE	1006784024	9.65	14698	0.063	-0.100	0.109	0.176	135.140125	-40.518811	-1020.89	33.67
6	GUIDE	1006646160	10.41	14688	0.059	0.175	0.132	0.216	134.960399	-40.683654	-1421.34	-624.42
7	GUIDE	1006767392	9.85	14695	0.000	0.056	0.116	0.187	135.128758	-40.847245	-881.99	-1140.90

2.4 Star Slots

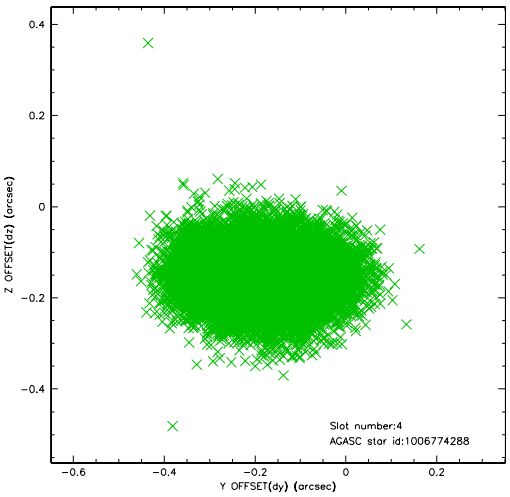
2.4.1 Slot 3

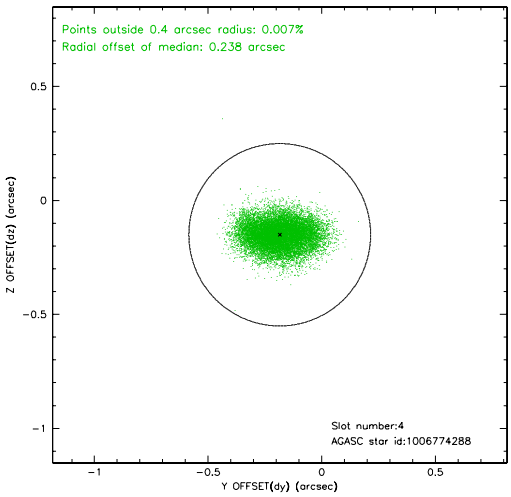


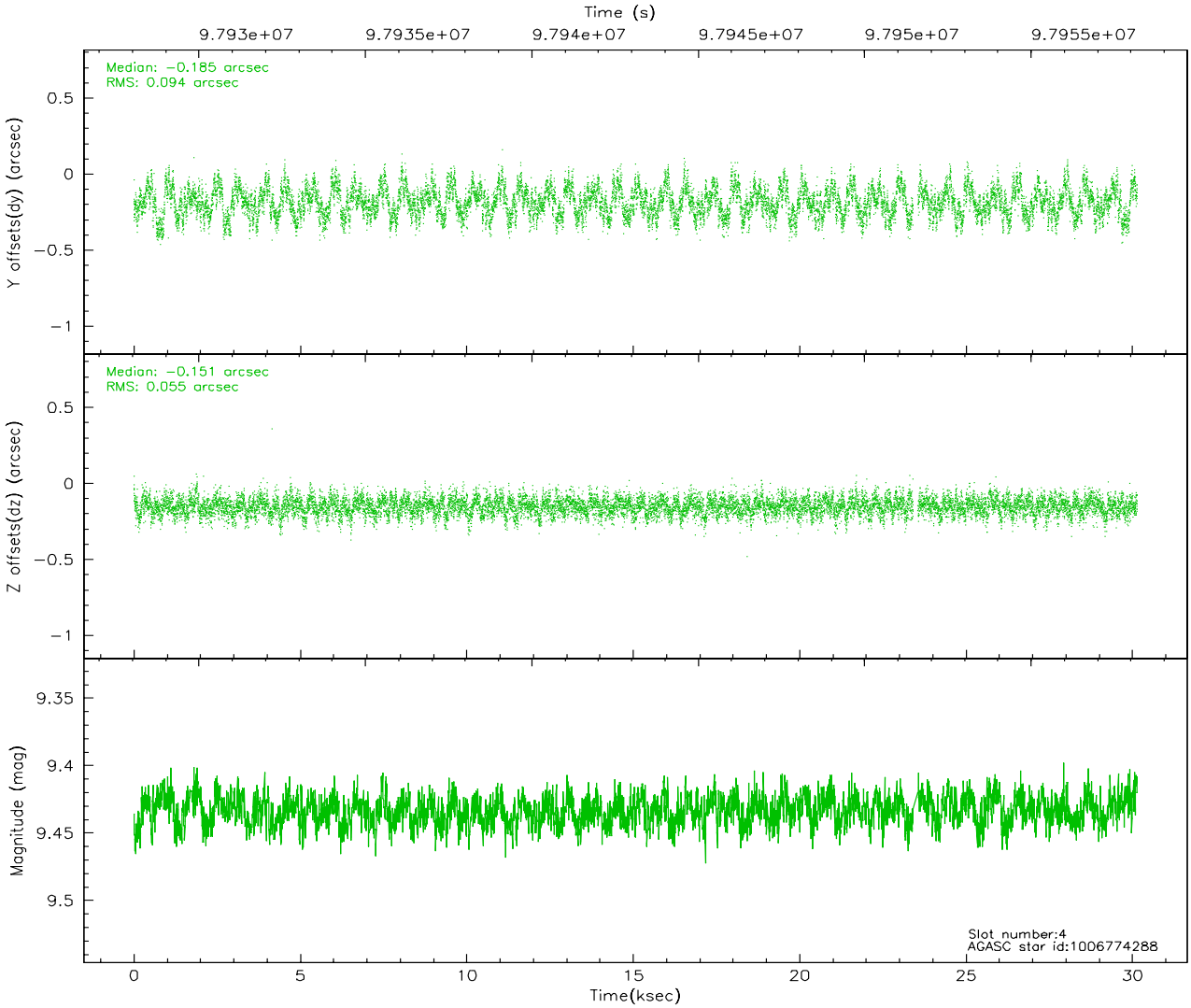




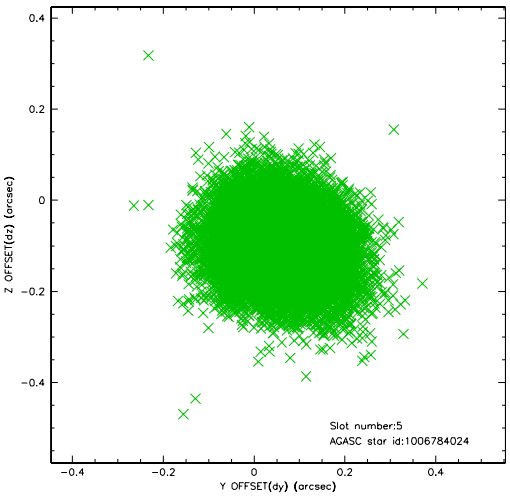
2.4.2 Slot 4

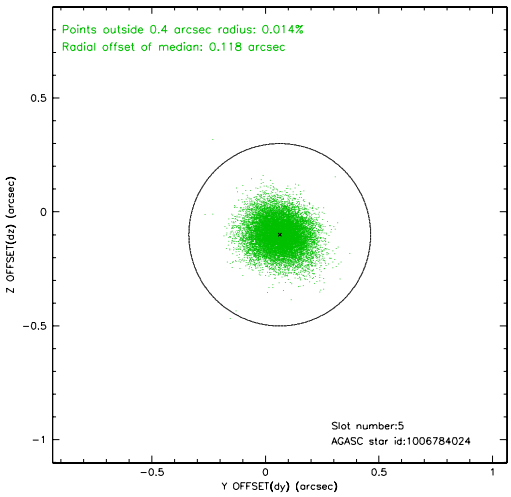

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1006774288

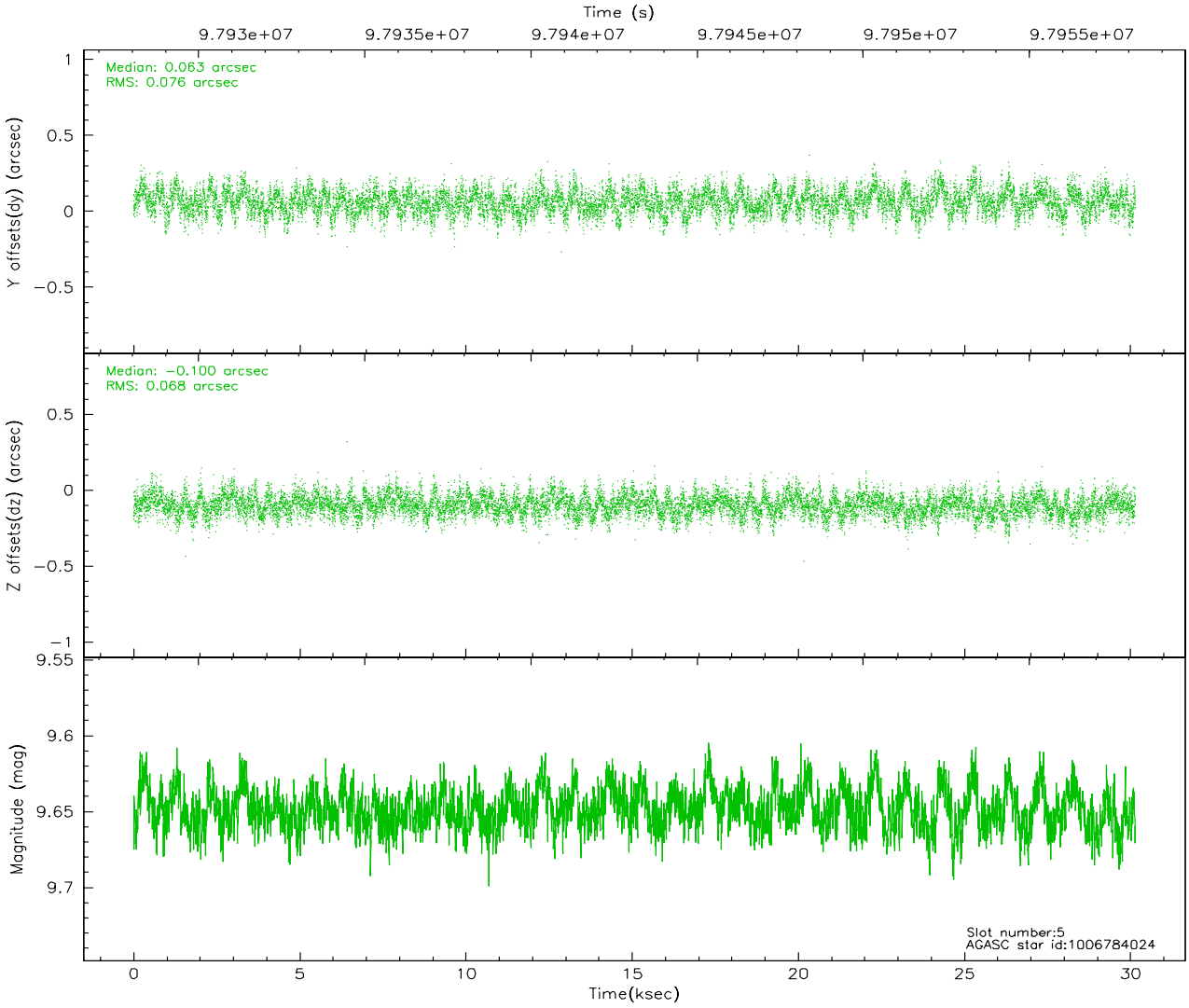

Points outside 0.4 arcsec radius: 0.007%
Radial offset of median: 0.238 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:1006774288


Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: −0.185 arcsec
RMS: 0.094 arcsec
Y offsets(dy) (arcsec)
Median: −0.151 arcsec
RMS: 0.055 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:4
AGASC star id:1006774288
Time(ksec)

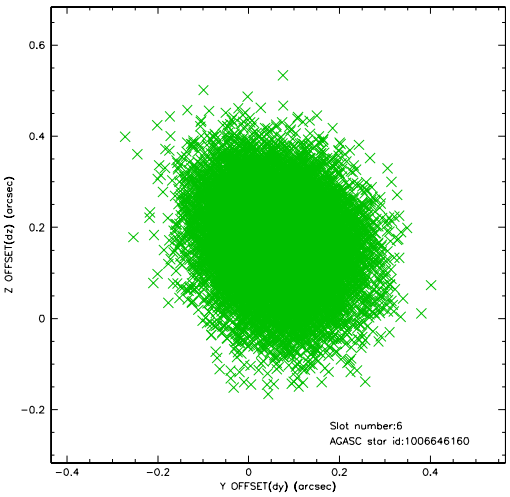
2.4.3 Slot 5

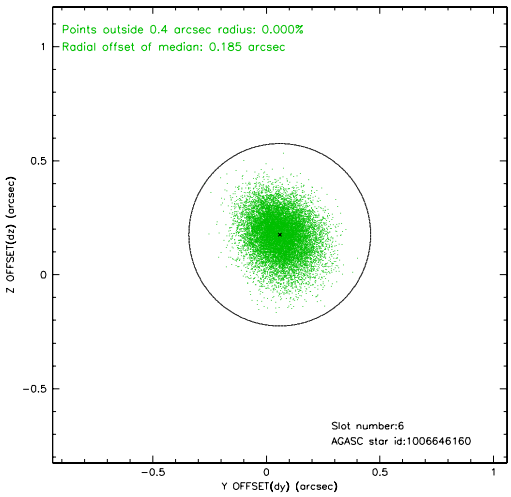

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1006784024

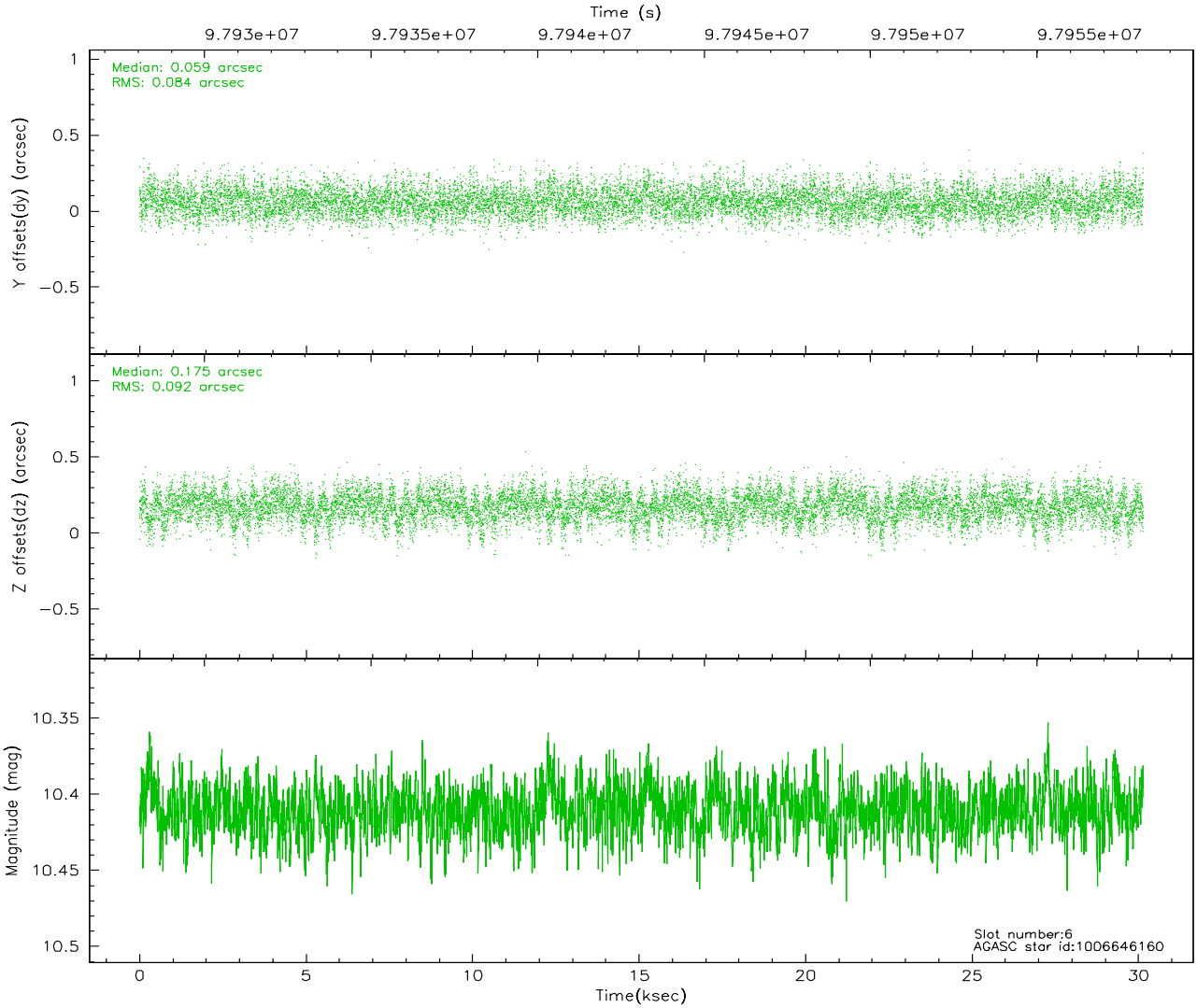

Points outside 0.4 arcsec radius: 0.014%
Radial offset of median: 0.118 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:1006784024


Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: 0.063 arcsec
RMS: 0.076 arcsec
Y offsets(dy) (arcsec)
Median: −0.100 arcsec
RMS: 0.068 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:5
AGASC star id:1006784024
Time(ksec)

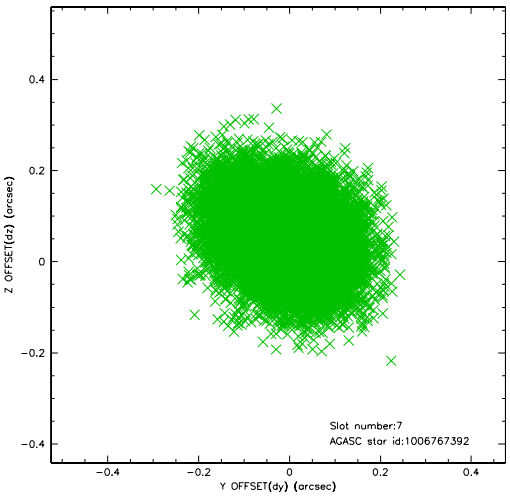
2.4.4 Slot 6

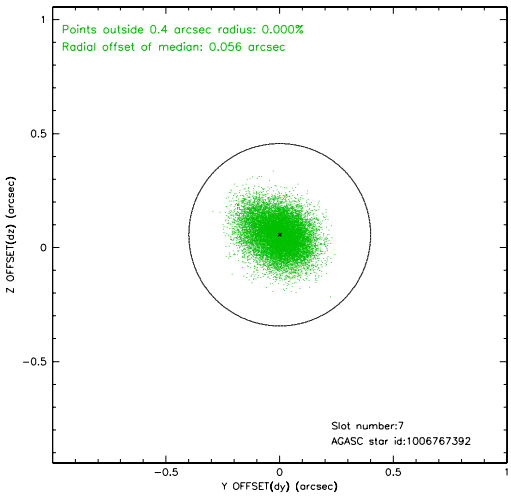

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1006646160

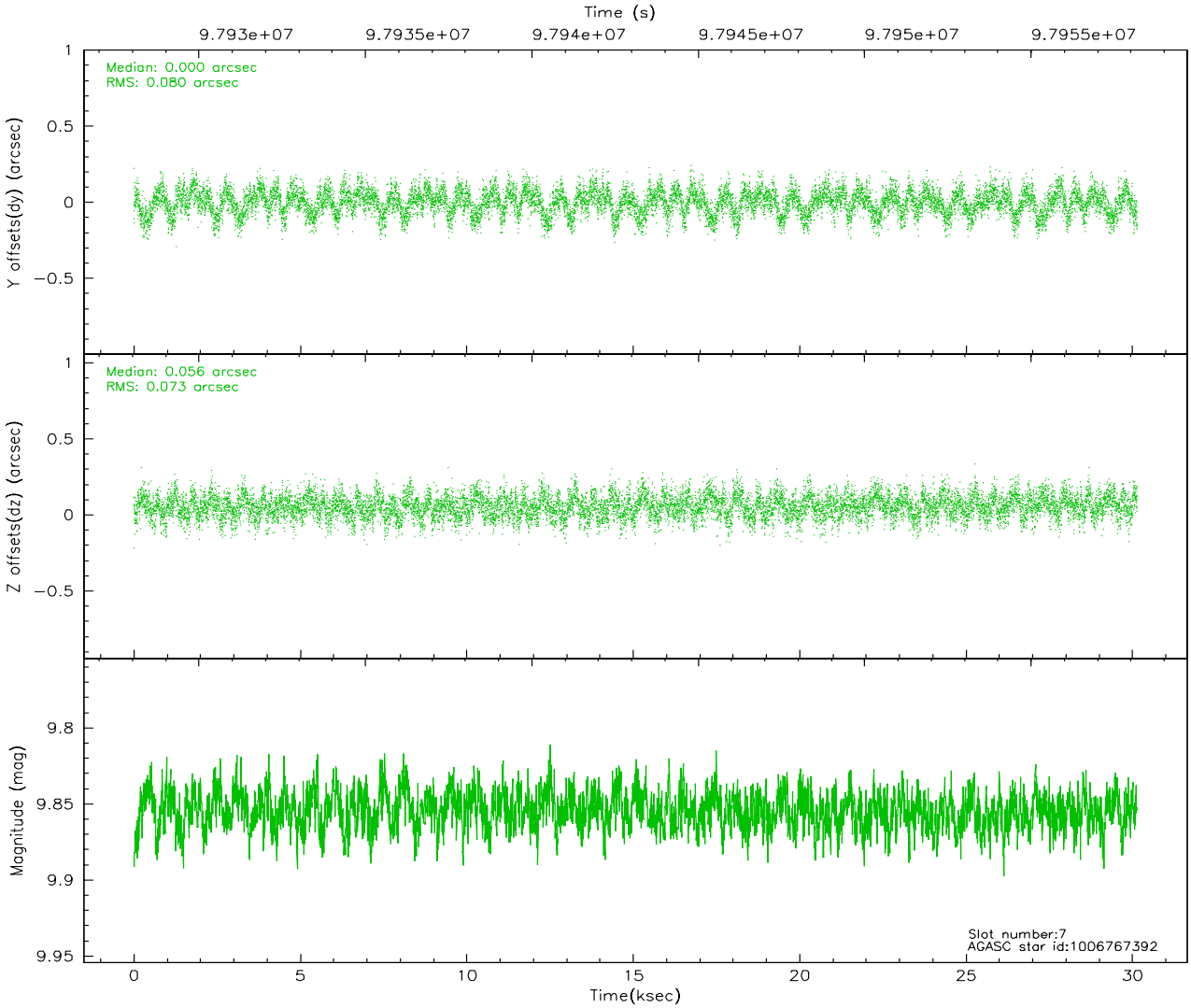

Points outside 0.4 arcsec radius: 0.000%
Radial offset of median: 0.185 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:1006646160


Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: 0.059 arcsec
RMS: 0.084 arcsec
Y offsets(dy) (arcsec)
Median: 0.175 arcsec
RMS: 0.092 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:6
AGASC star id:1006646160
Time(ksec)

2.4.5 Slot 7

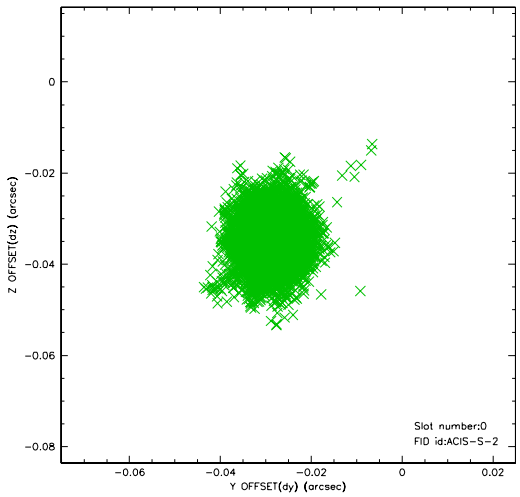

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1006767392

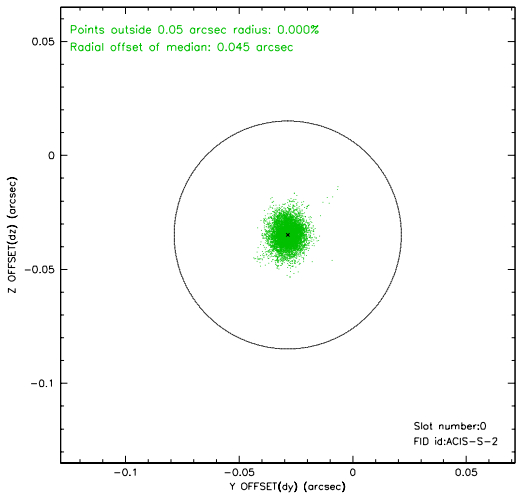

Points outside 0.4 arcsec radius: 0.000%
Radial offset of median: 0.056 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:1006767392

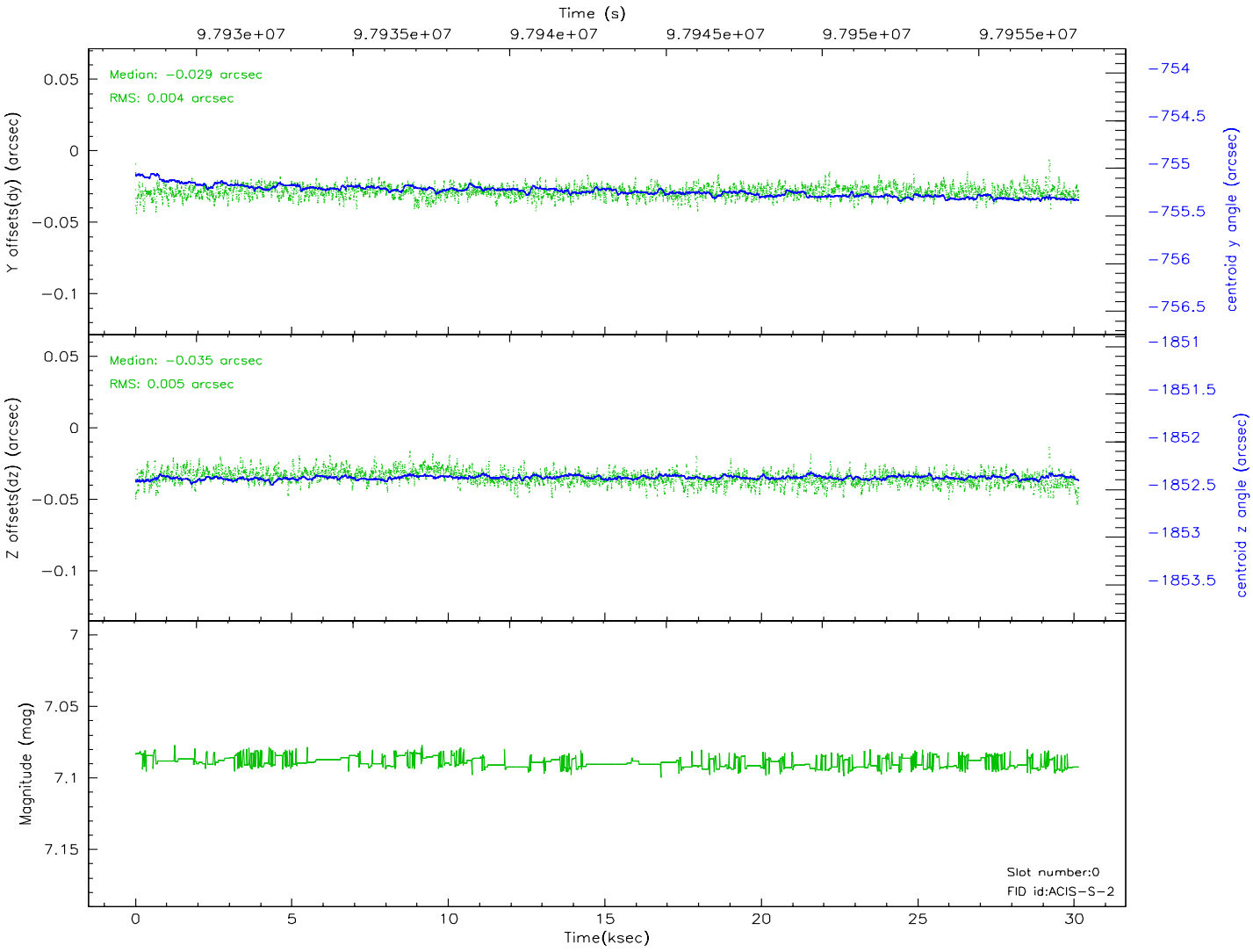

Time (s)
9.793e+07
9.7935e+07
9.794e+07
9.7945e+07
9.795e+07
9.7955e+07
Median: 0.000 arcsec
RMS: 0.080 arcsec
Y offsets(dy) (arcsec)
Median: 0.056 arcsec
RMS: 0.073 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:7
AGASC star id:1006767392
Time(ksec)

2.5 FID Slots

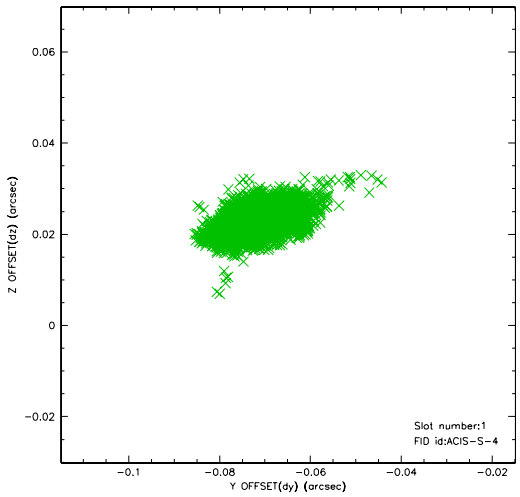
2.5.1 Slot 0

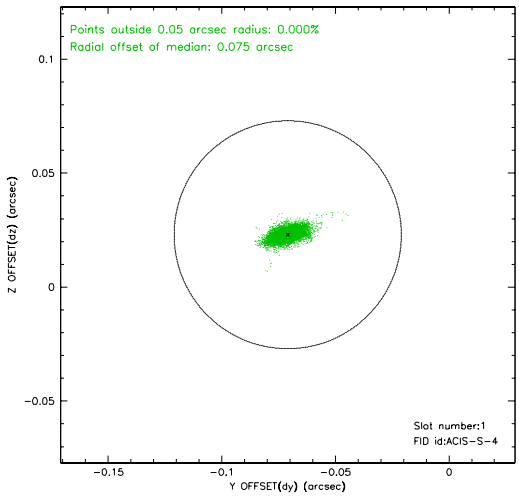


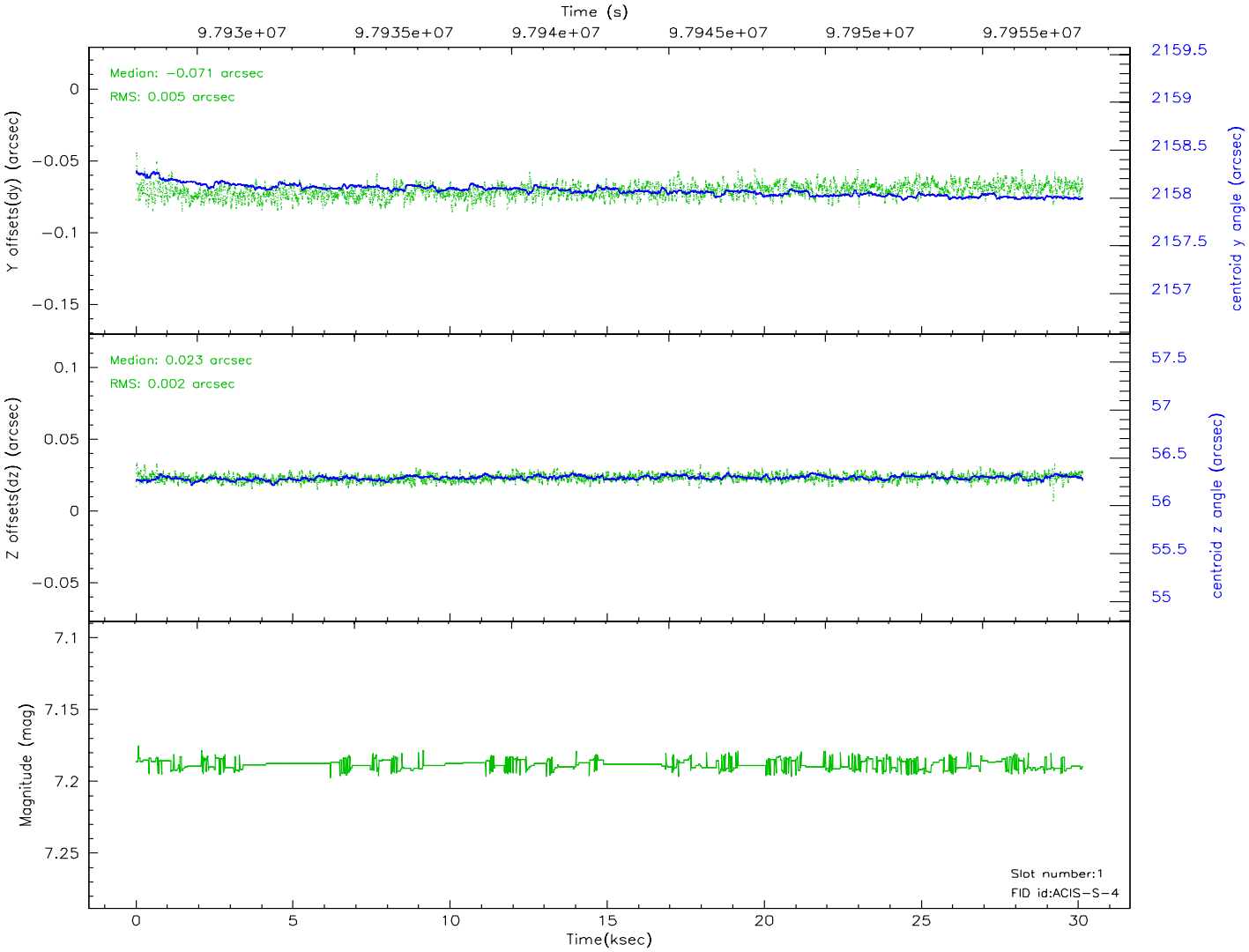




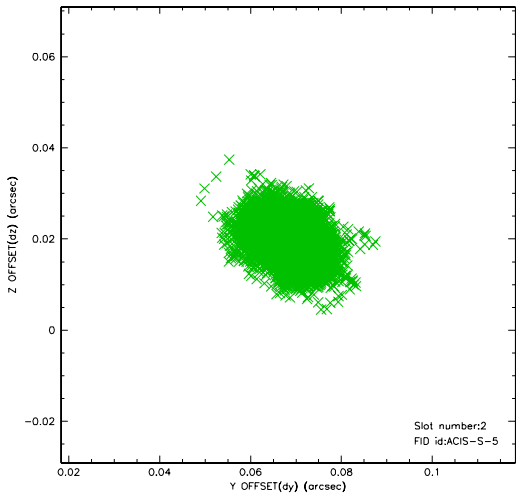
2.5.2 Slot 1

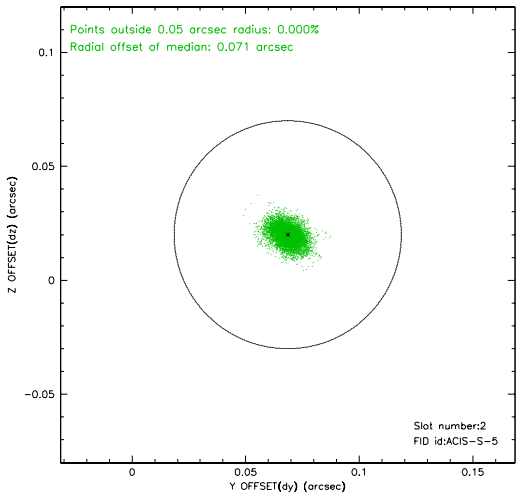

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4

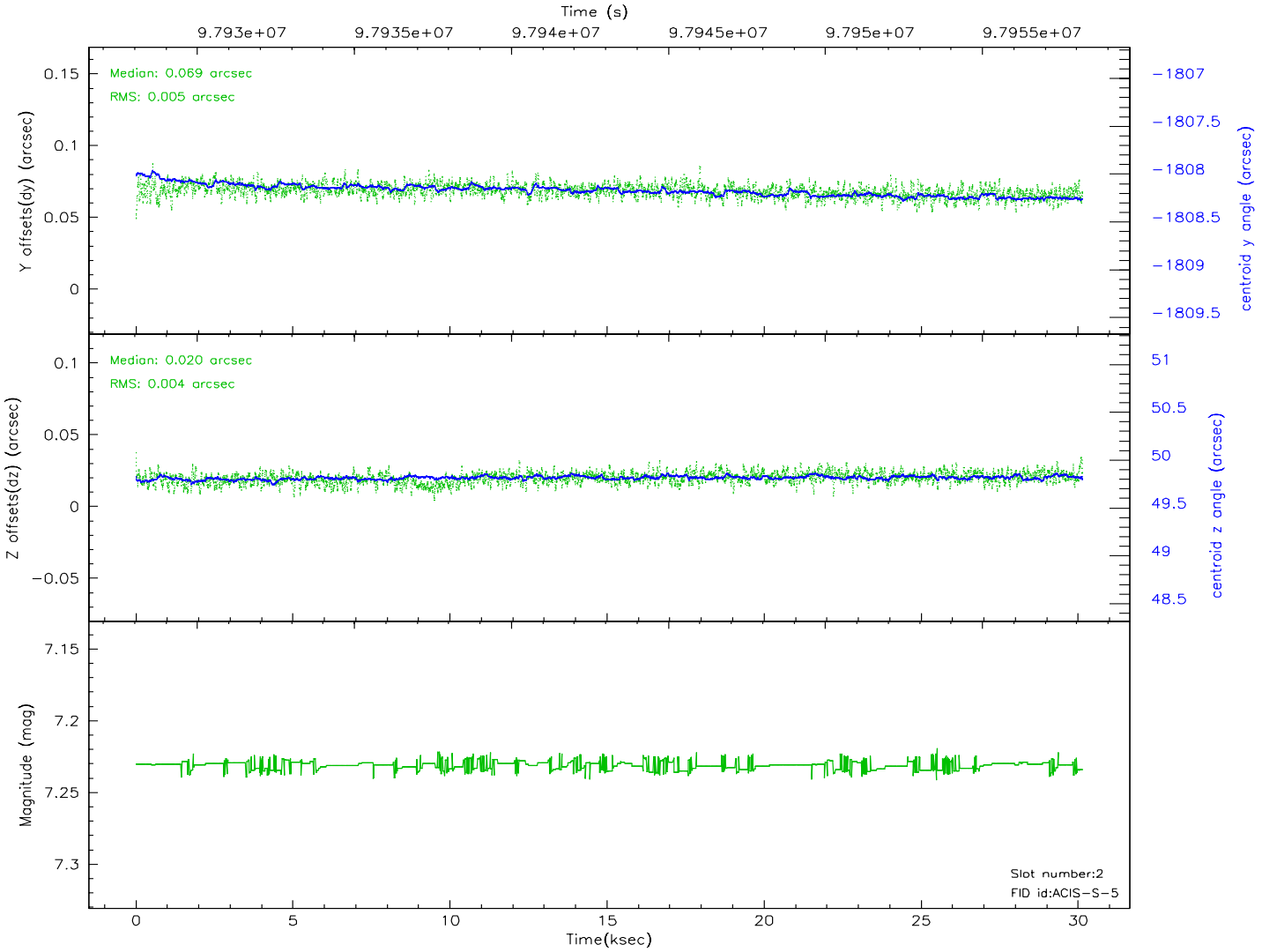

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.075 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4


Time (s)
Median: −0.071 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.023 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

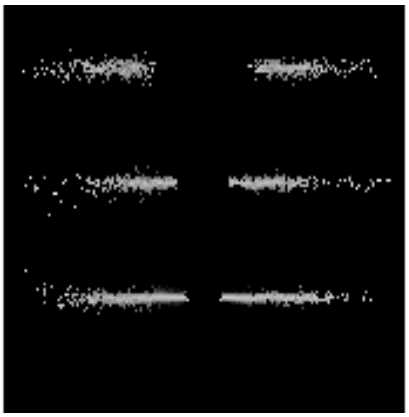

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.071 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5

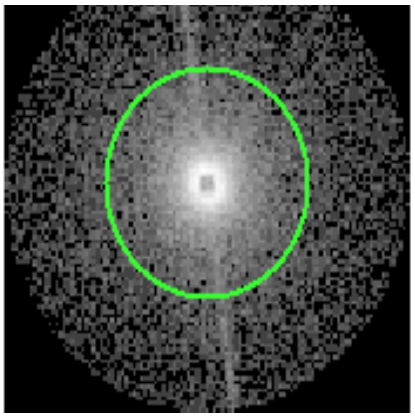

Time (s)
Median: 0.069 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.020 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:2
FID id:ACIS-S-5
Time(ksec)

3 Gratings

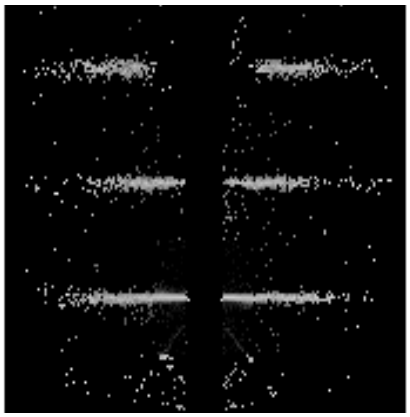
3.1 HEG Arm



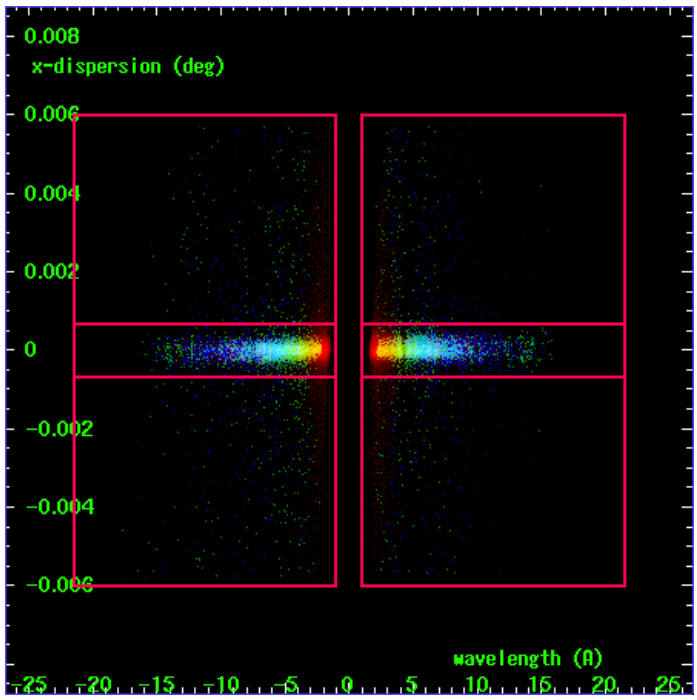
HEG Order Sort 123



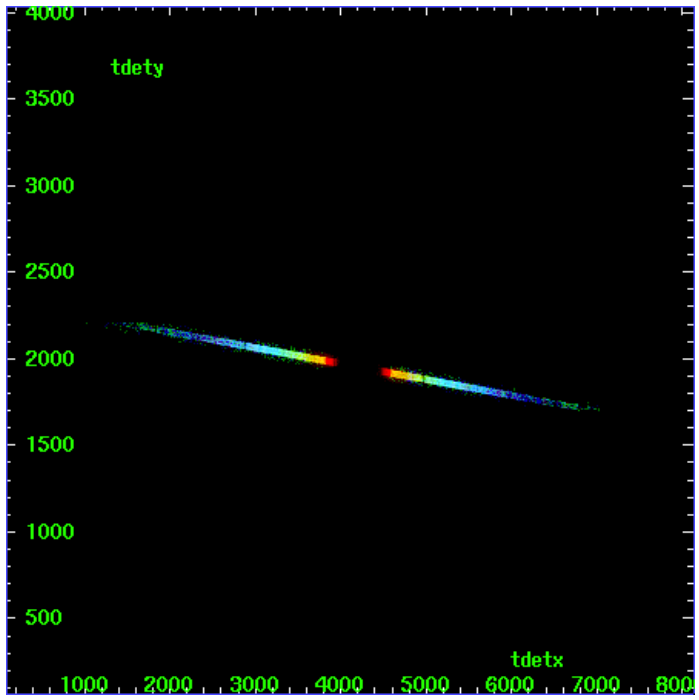
HEG Zero Order



HEG Order Sort ALL

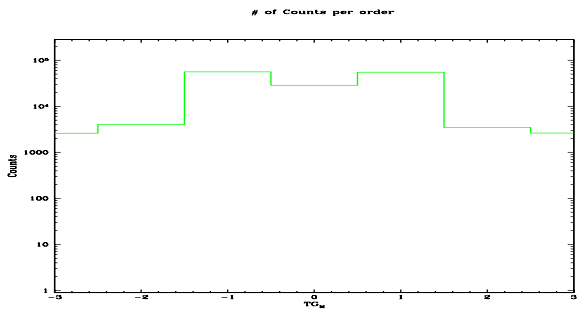


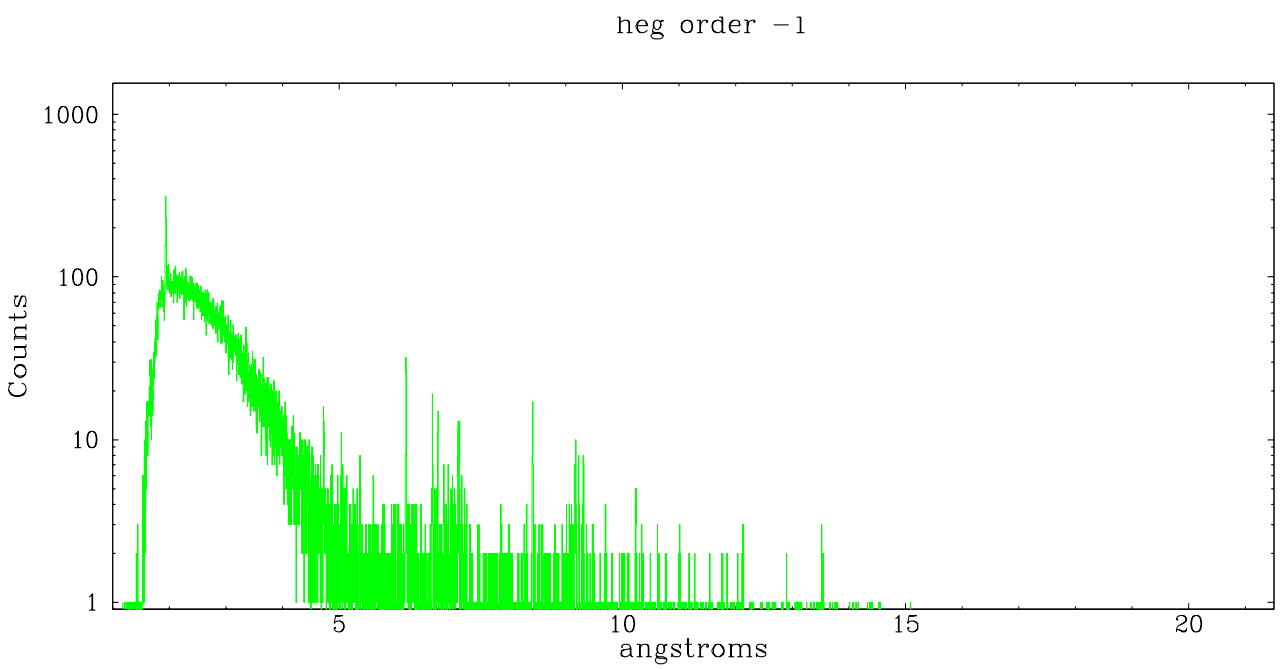
Spot Image HEG

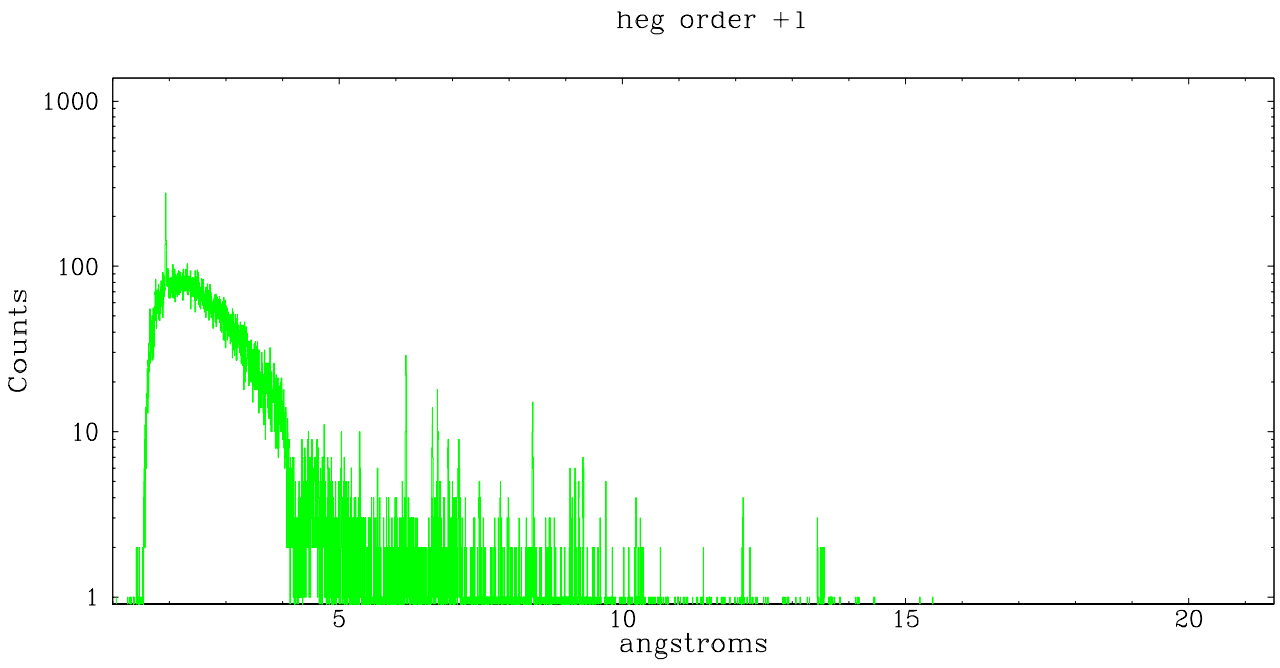


Full Detector HEG

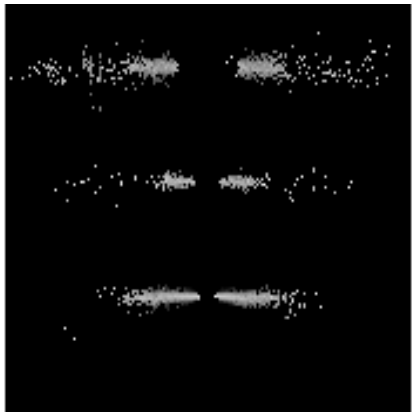
	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	2603	4049	56126	28527	54897	3465	2626



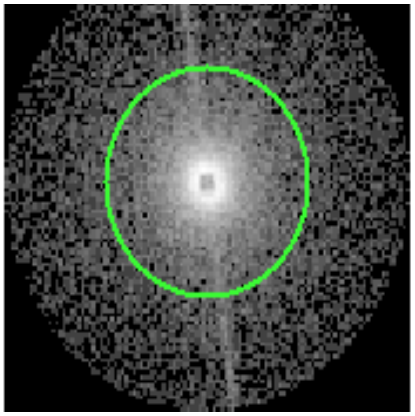

heg order −1
1000
100
10
1
Counts
5
10
15
20
angstroms


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

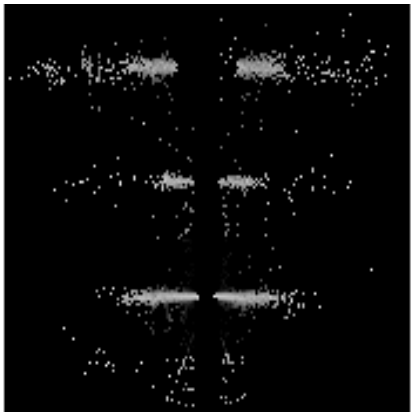
3.2 MEG Arm



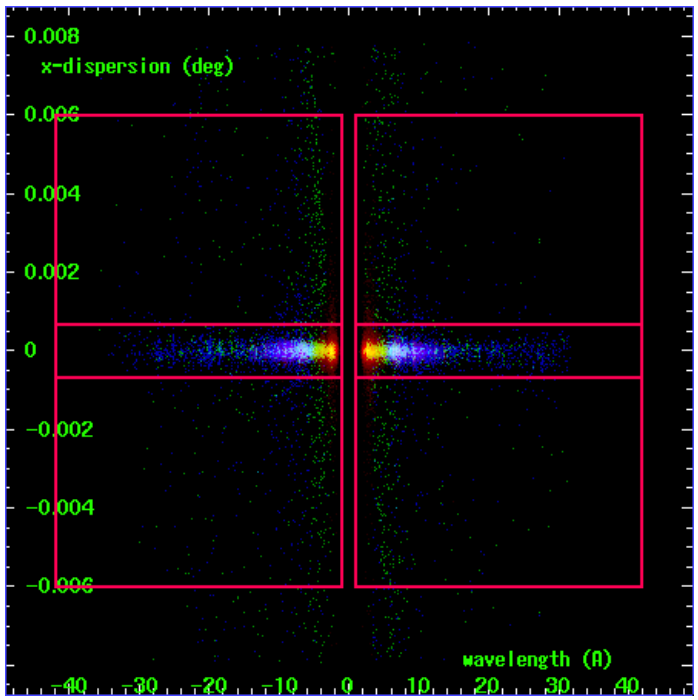
MEG Order Sort 123



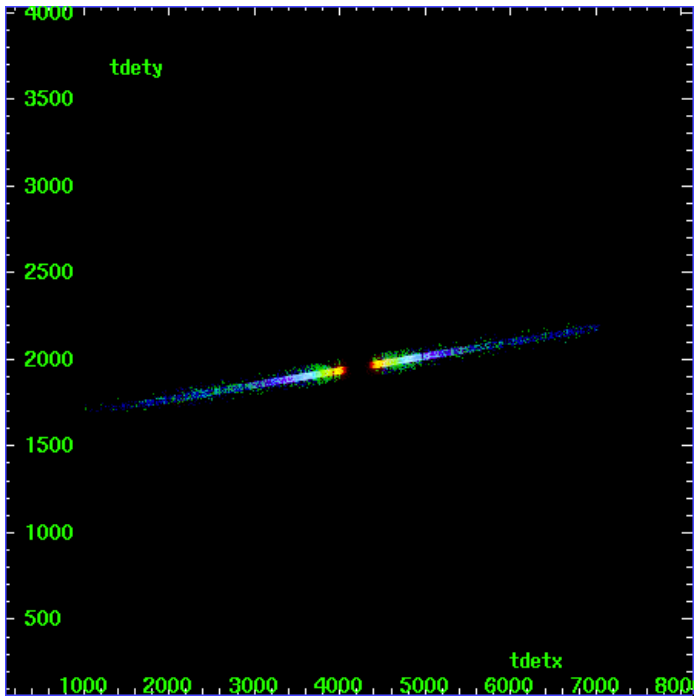
MEG Zero Order



MEG Order Sort ALL

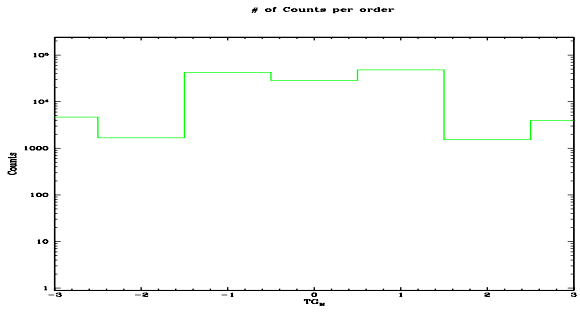


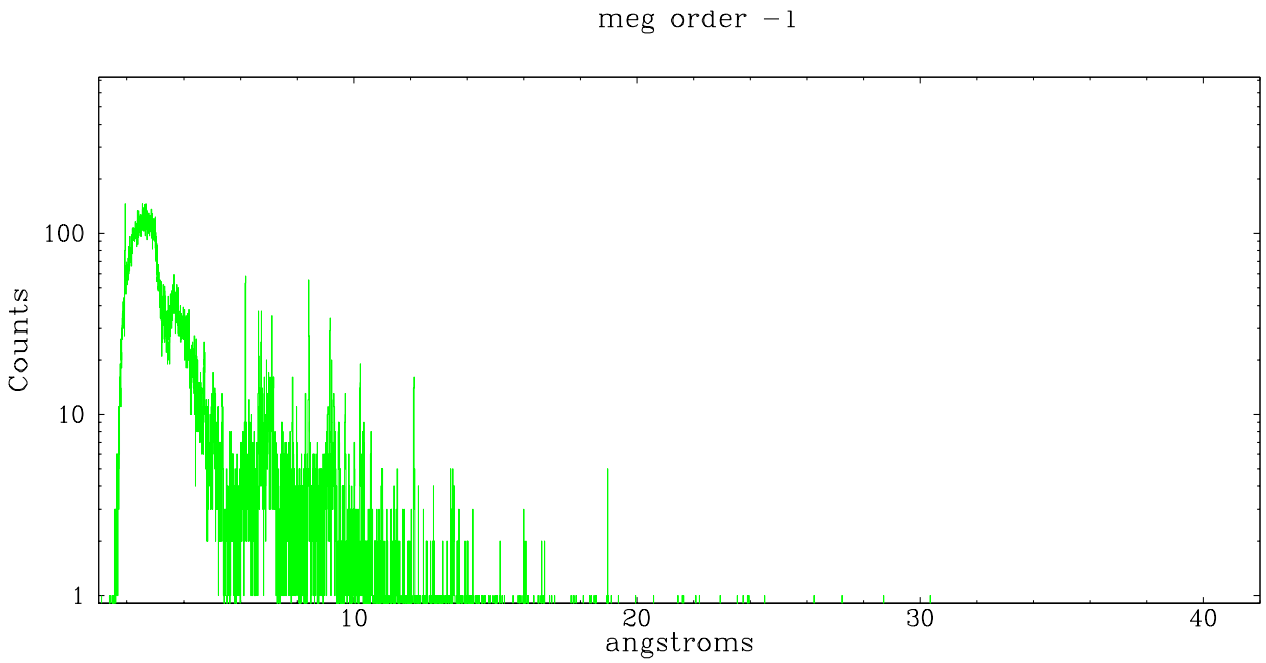
Spot Image MEG

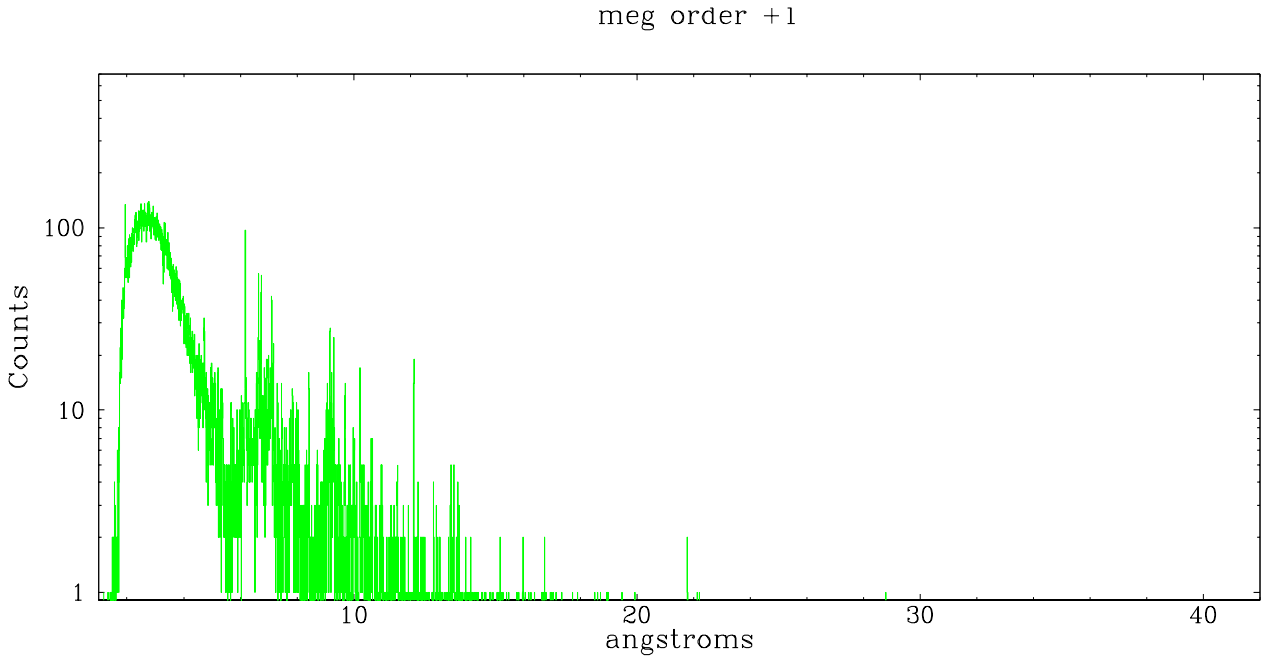


Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	4668	1682	42379	28527	48043	1528	3943




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


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

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2006.12.15
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	30.141

A.2 Comments

Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used to input the correct sky coordinates into the *src1a.fits file. These corrected coordinates were determined using the software tool findzero.sl in ISIS, a CXC software package for data analysis. The tool calculates the intersection point 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 the extraction of the spectrum because it found a zeroth order position on the wings of the PSF due to the piled up profile. The *pha2.fits file has the extracted spectral data based on the corrected zeroth order position. Note that these corrected coordinates of the zeroth order cannot be reproduced by running tgdetect with the default parameters on the data.