V&V Reference Report
L2 ASCDS Version : 8.4.4

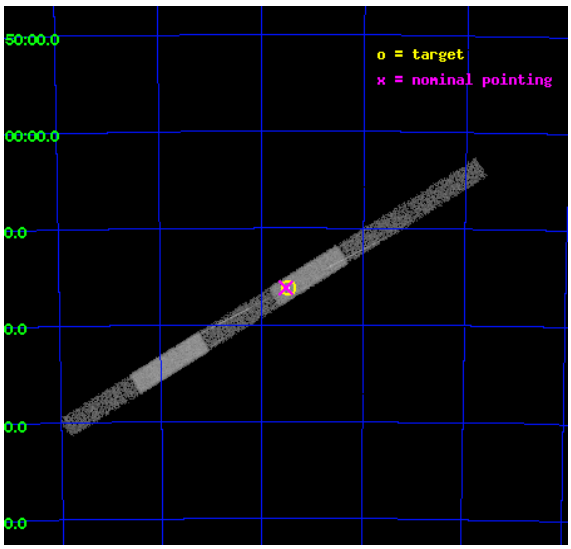
Observation 10853 - L2 Version 2
Chandra X-Ray Center

L2 Processing Date : May 29 2012

Contents

1 Front

seq_num	501148	Sequence number
obs_id	10853	Observation id
title	Chandra Cycle 10 Spatial and Spectral Monitoring of SNR 1987A	Prop
observer	Prof. David Burrows	Principal investigator
object	SNR 1987A	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	83.866667	Observer's specified target RA [deg]
dec_targ	-69.26975	Observer's specified target Dec [deg]
ra_nom	83.880354520396	Nominal RA [deg]
dec_nom	-69.269769146147	Nominal Dec [deg]
roll_nom	328.16942208749	Nominal Roll [deg]
revision	2	Processing version of data
ontime	11667.700252891	Sum of GTIs [s]
livetime	11248.045886366	Livetime [s]
ontime4	11667.700252891	Sum of GTIs [s]
ontime5	11667.700252891	Sum of GTIs [s]
ontime6	11667.700252891	Sum of GTIs [s]
ontime7	11667.700252891	Sum of GTIs [s]
ontime8	11667.700252891	Sum of GTIs [s]
ontime9	11667.700252891	Sum of GTIs [s]
l2events	40653	Number of level 2 events

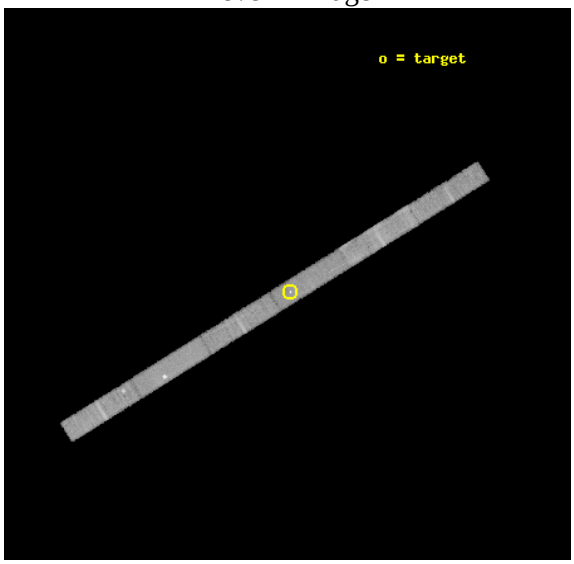


2 OBI

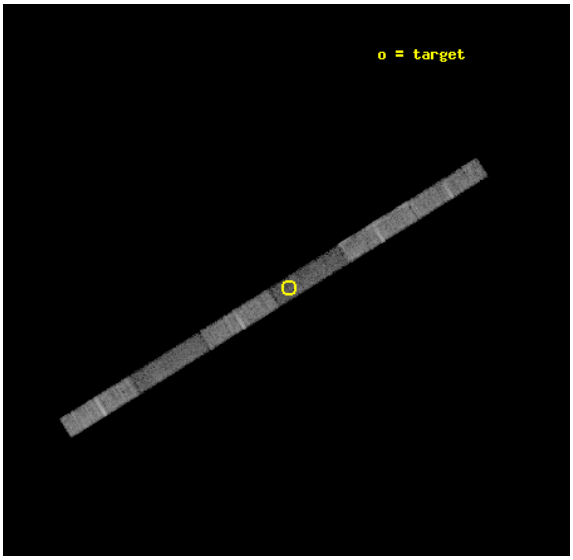
2.1 OBI

2.1.1 Images

Level 1 Image

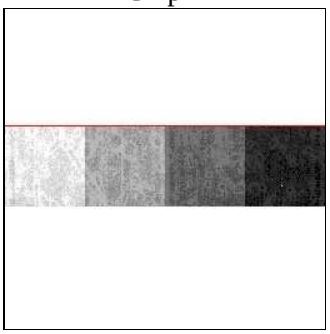


Level 1 Bad Events

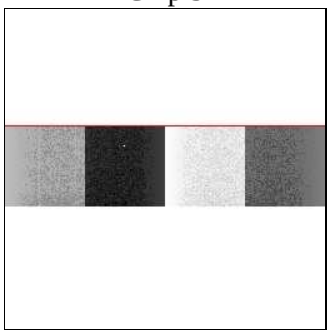


2.1.2 Bias

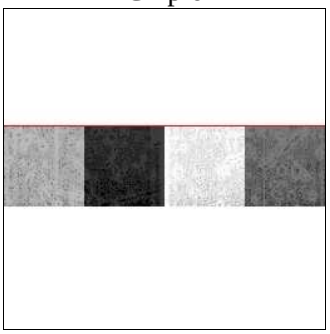
Chip 4



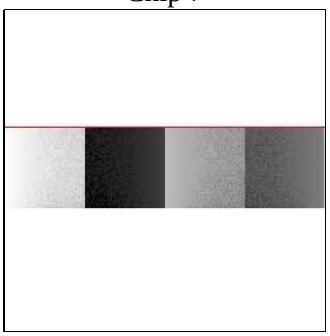
Chip 5



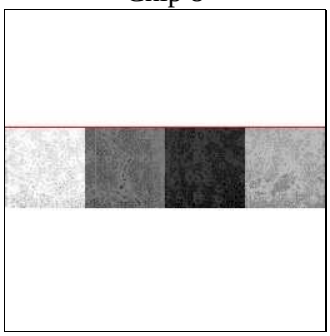
Chip 6



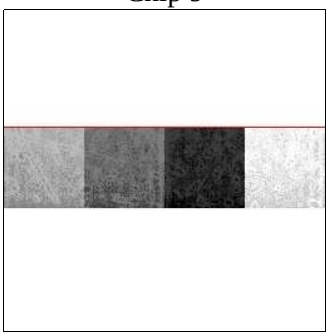
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	8.4.4	Processing system revision
caldbver	4.4.9	
date	2012-05-29T01:36:22	Date and time of file creation
revision	2	Processing version of data

sched_exp_time	11500.000000	[s] Scheduled observation exposure time
ontime	11667.700252891	Sum of GTIs [s]
ontime4	11667.700252891	Sum of GTIs [s]
ontime5	11667.700252891	Sum of GTIs [s]
ontime6	11667.700252891	Sum of GTIs [s]
ontime7	11667.700252891	Sum of GTIs [s]
ontime8	11667.700252891	Sum of GTIs [s]
ontime9	11667.700252891	Sum of GTIs [s]
l1events	195780	Number of level 1 events

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	36150	35422	30442	27457	39024	27285
rejected events	31982	15961	26564	12998	29777	24498
rejected %	88%	45%	87%	47%	76%	89%

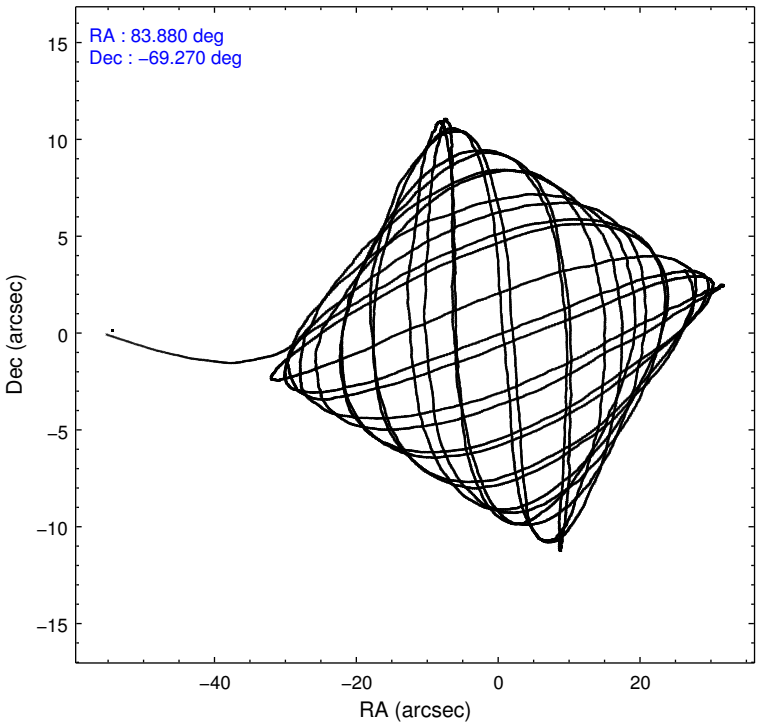
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	2122	4895	1787	1985	2653	905
	5%	13%	5%	7%	6%	3%
grade 1 events	25	82	8	48	23	9
	0%	0%	0%	0%	0%	0%
grade 2 events	761	5122	708	3400	2082	504
	2%	14%	2%	12%	5%	1%
grade 3 events	485	1128	517	1629	1128	468
	1%	3%	1%	5%	2%	1%
grade 4 events	446	1104	490	1660	1068	477
	1%	3%	1%	6%	2%	1%
grade 5 events	931	2935	868	2771	1389	922
	2%	8%	2%	10%	3%	3%
grade 6 events	583	8240	545	6345	2651	538
	1%	23%	1%	23%	6%	1%
grade 7 events	30797	11916	25519	9619	28030	23462
	85%	33%	83%	35%	71%	85%

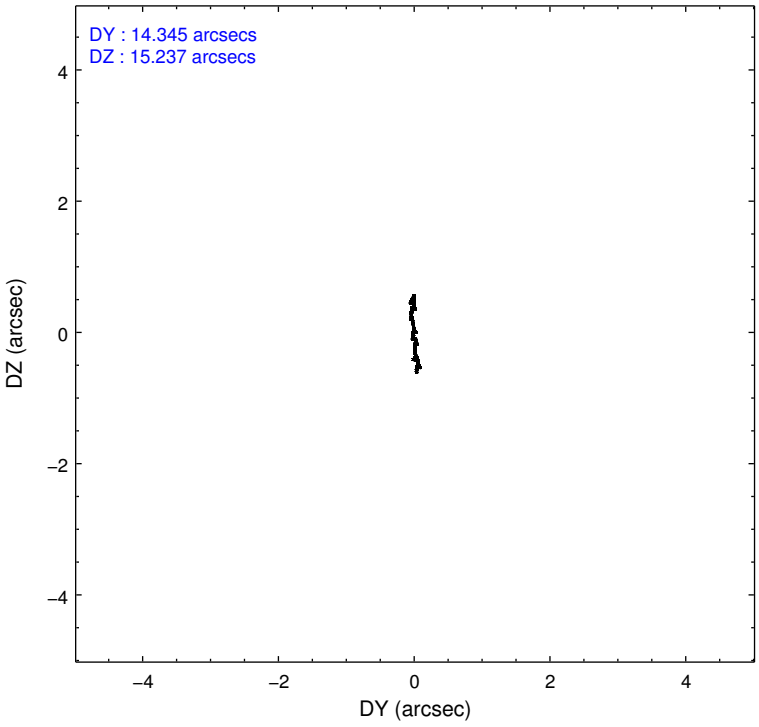
2.2 Compared Parameters

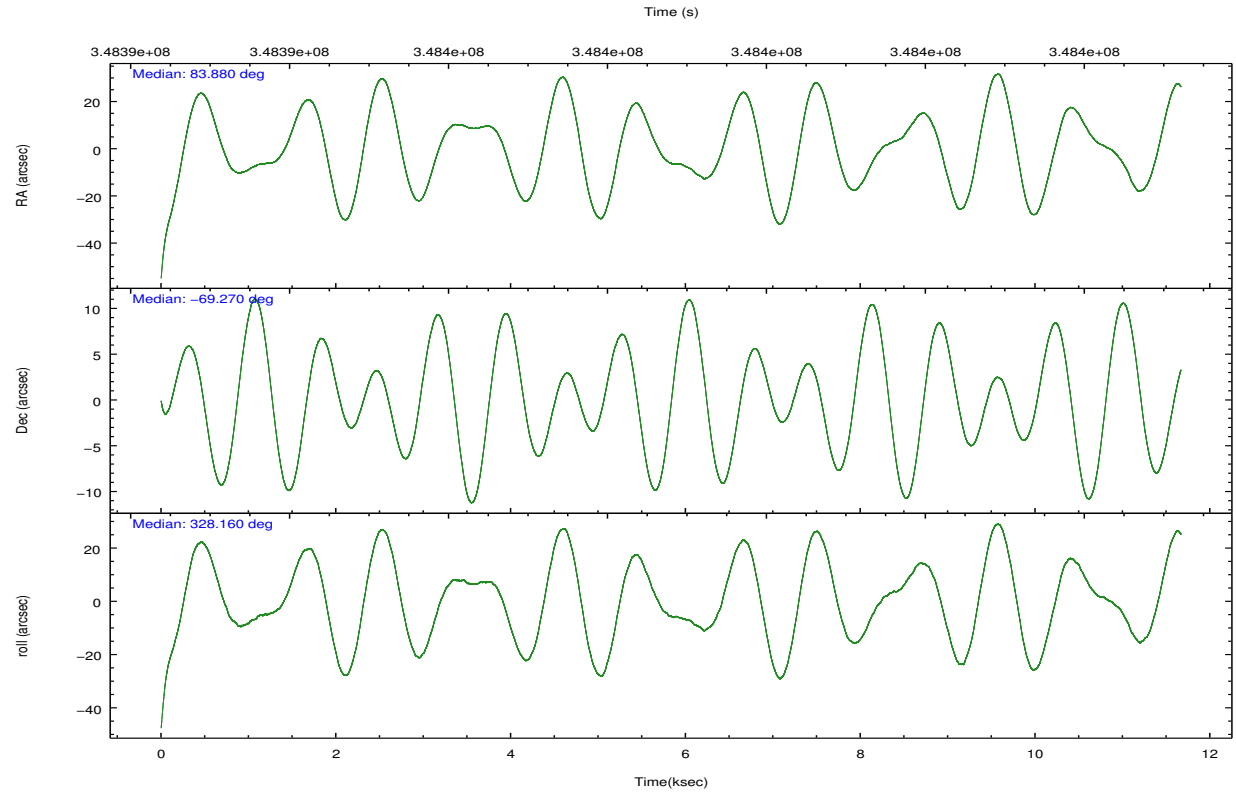
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	HETG	HETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	83.803119	83.88035452039566
[deg] Pointing Dec	-69.269250	-69.26976914614734
[deg] Pointing Roll	327.940565	328.1694220874866
[s] Window start time (MET)	347155266.184000	347155266.184000
[s] Window stop time (MET)	349747266.184000	349747266.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1425803651734
[mm] SIM translation stage offset	0	0.01005778216563158
[s] Observation start time (MET)	348393132.184000	348392063.92135
Observation start date	2009-01-15T07:51:06	2009-01-15T07:34:23
[s] Observation end time (MET)	348404632.184000	348404853.87198
Observation end date	2009-01-15T11:02:46	2009-01-15T11:07:33
Read mode	TIMED	TIMED

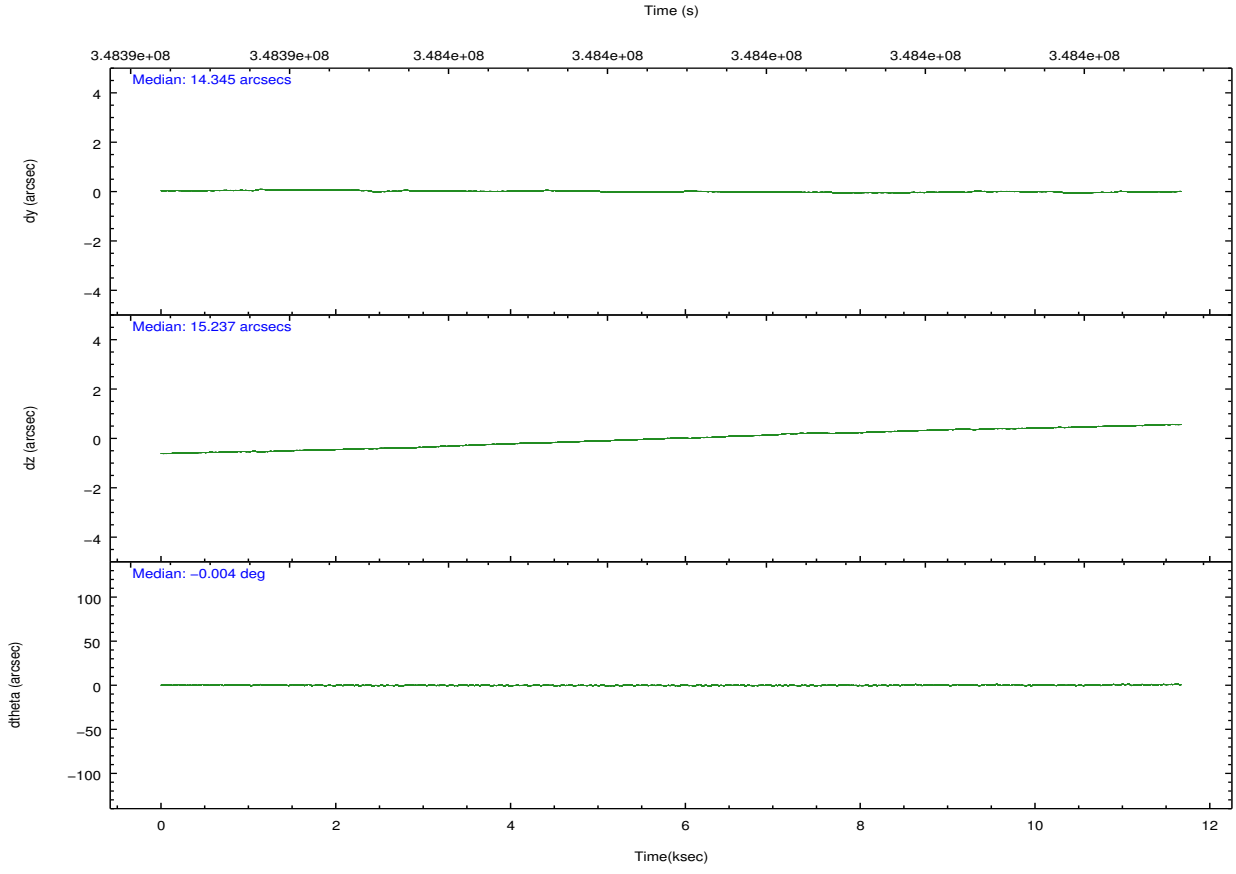
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
CCD I0 on	N	N
CCD I1 on	N	N
CCD I2 on	N	N
CCD I3 on	N	N
CCD S0 on	O1	Y
CCD S1 on	Y	Y
CCD S2 on	Y	Y
CCD S3 on	Y	Y
CCD S4 on	Y	Y
CCD S5 on	Y	Y
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	CUSTOM	1/4
Subarray start row	393	393
Subarray row count	256	256
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	1.1

2.3 Aspect


RA : 83.880 deg
Dec : −69.270 deg
Dec (arcsec)
RA (arcsec)
15
10
5
0
−5
−10
−15
−40
−20
0
20


DY : 14.345 arcsecs
DZ : 15.237 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
3.4839e+08
3.4839e+08
3.484e+08
3.484e+08
3.484e+08
3.484e+08
3.484e+08
Median: 83.880 deg
RA (arcsec)
Median: −69.270 deg
Dec (arcsec)
Median: 328.160 deg
roll (arcsec)
Time(ksec)

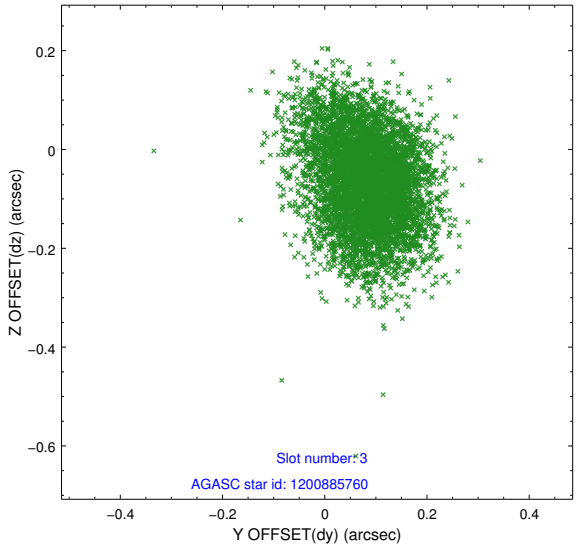

Time (s)
3.4839e+08
3.4839e+08
3.484e+08
3.484e+08
3.484e+08
3.484e+08
3.484e+08
Median: 14.345 arcsecs
dy (arcsec)
Median: 15.237 arcsecs
dz (arcsec)
Median: −0.004 deg
dtheta (arcsec)
Time(ksec)

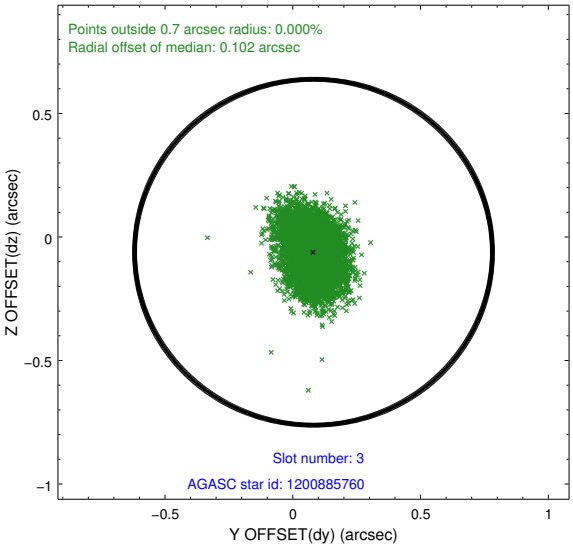
Slot Statistics

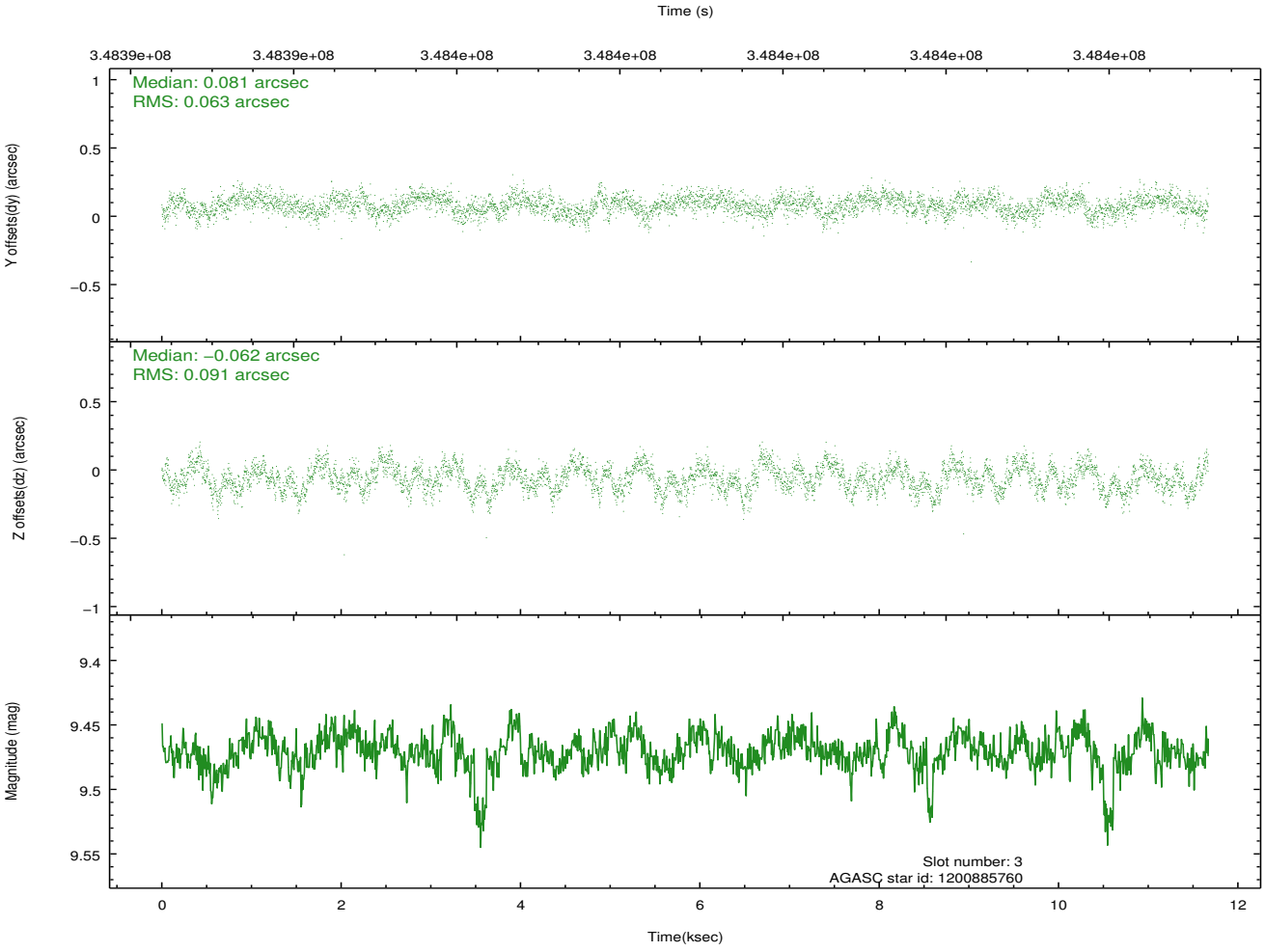
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	6.97	2846	-0.083	-0.027	0.009	0.015	0.000000	0.000000	-767.37	-1736.59
1	FID	ACIS-S-4	7.06	2846	0.213	0.048	0.006	0.010	0.000000	0.000000	2145.99	171.54
2	FID	ACIS-S-5	7.09	2847	-0.161	-0.012	0.008	0.013	0.000000	0.000000	-1819.75	165.62
3	GUIDE	1200885760	9.47	5689	0.081	-0.062	0.118	0.192	83.723637	-68.777667	-1026.98	1444.73
4	GUIDE	1201019200	9.47	5675	0.053	-0.100	0.100	0.163	84.213591	-68.777384	-485.86	1783.40
5	GUIDE	1201542672	8.20	5692	-0.110	0.081	0.087	0.149	84.492488	-69.957531	2038.48	-1650.10
6	GUIDE	1200884248	9.47	5687	-0.005	-0.221	0.119	0.187	83.880915	-68.565170	-1258.41	2202.25
7	GUIDE	1201410616	9.33	5687	-0.029	0.299	0.144	0.227	82.516808	-69.784406	-362.44	-2434.44

2.4 Star Slots

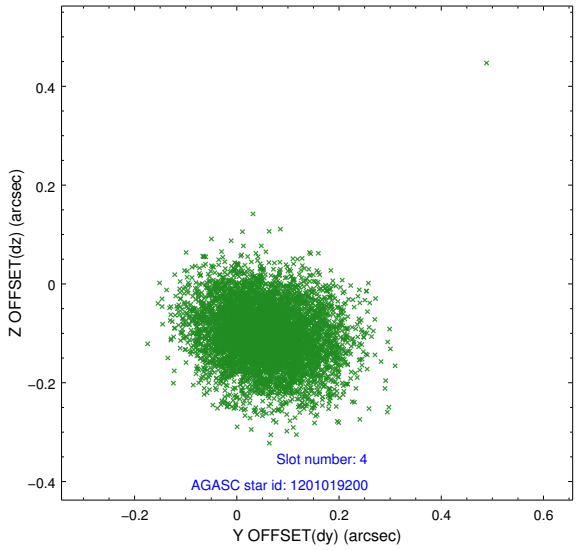
2.4.1 Slot 3

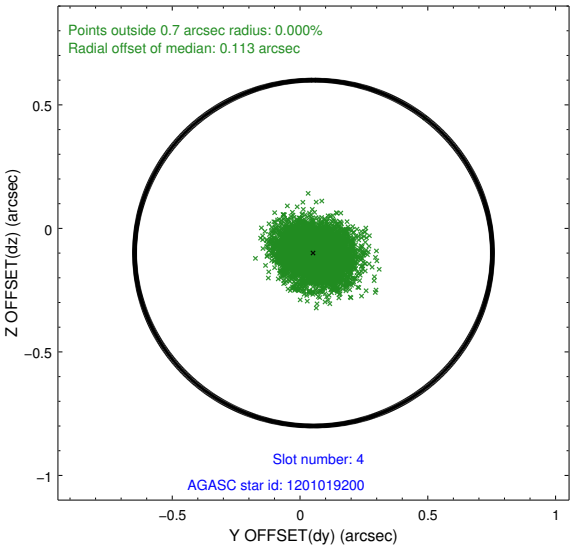


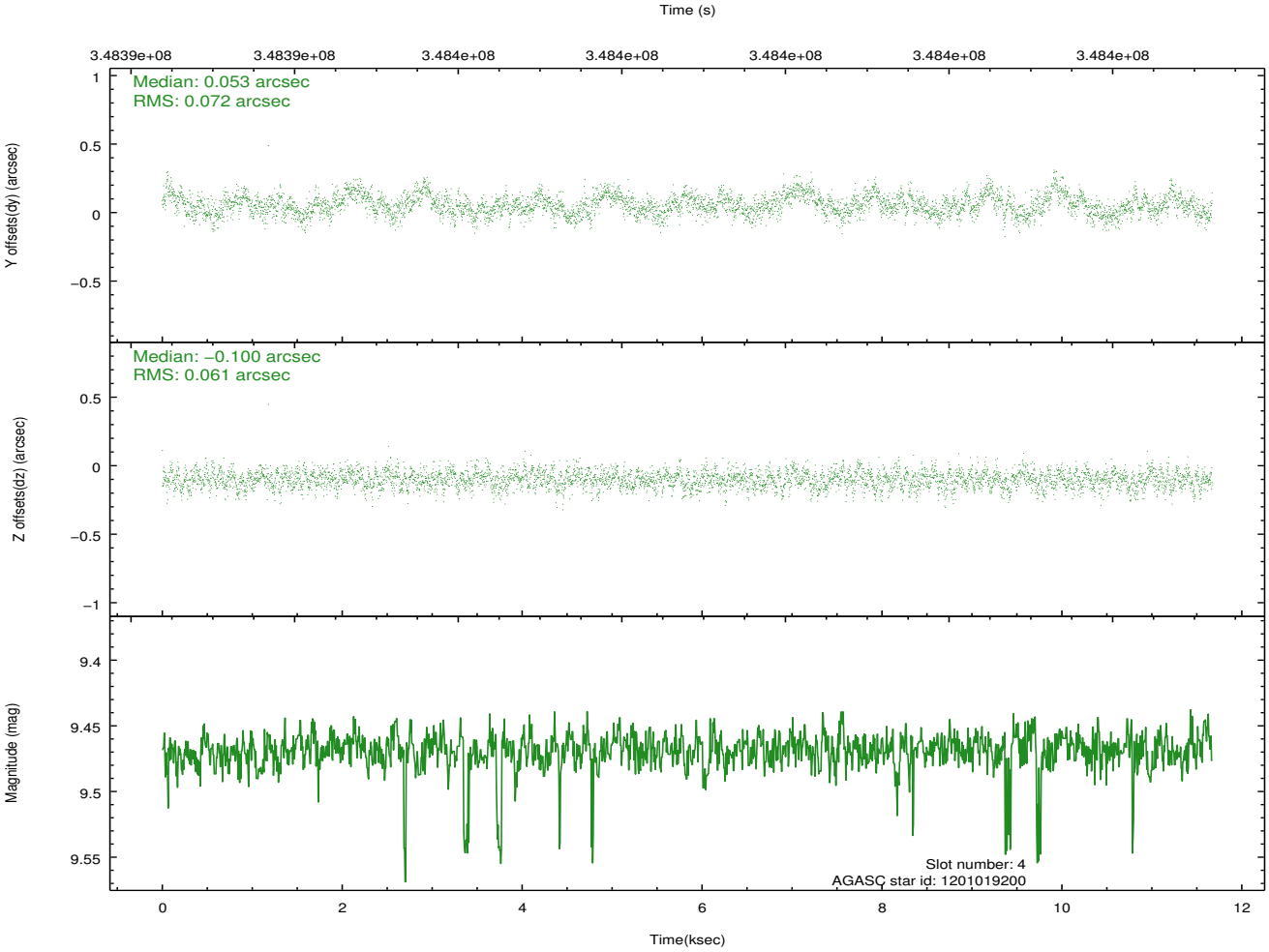




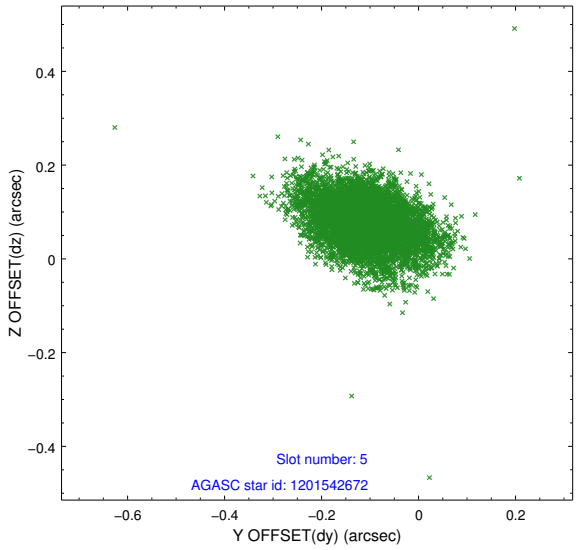
2.4.2 Slot 4

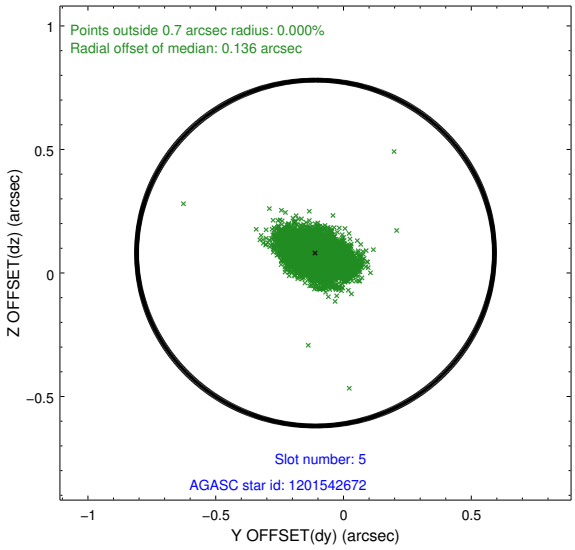

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 1201019200

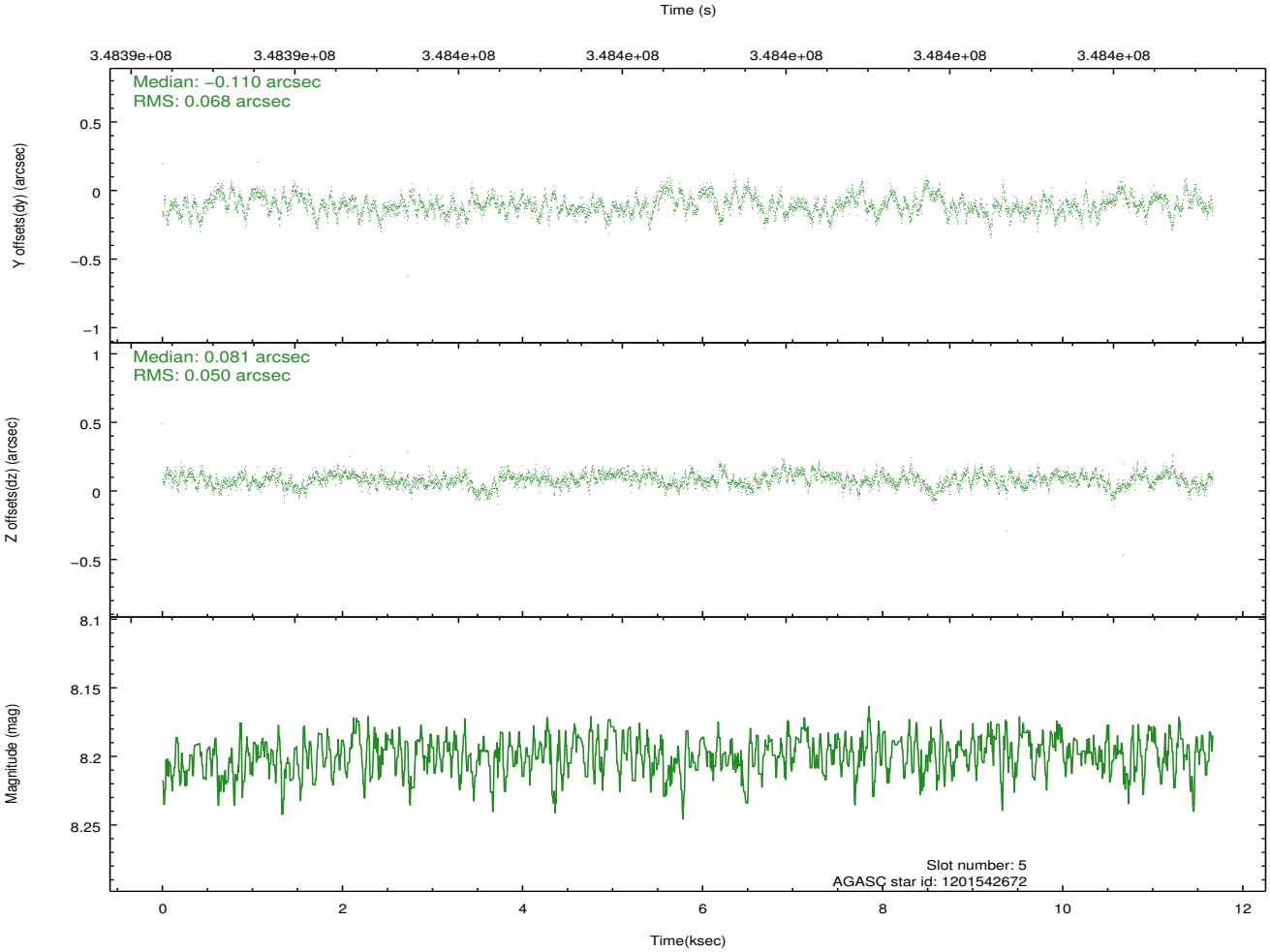

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.113 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 4
AGASC star id: 1201019200


Time (s)
Median: 0.053 arcsec
RMS: 0.072 arcsec
Y offsets(dy) (arcsec)
Median: −0.100 arcsec
RMS: 0.061 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 4
AGASC star id: 1201019200
Time(ksec)

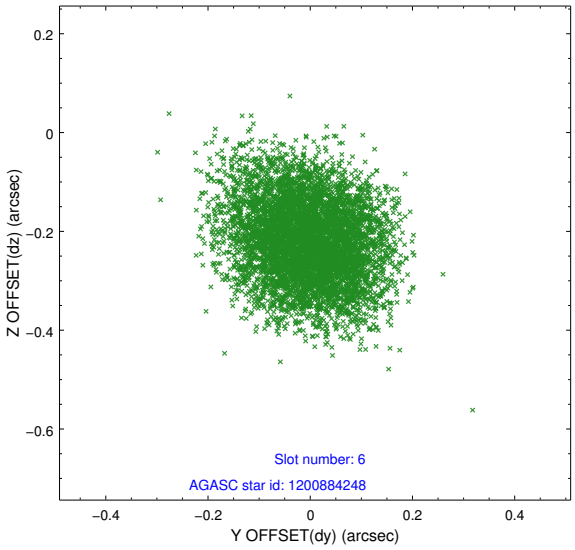
2.4.3 Slot 5

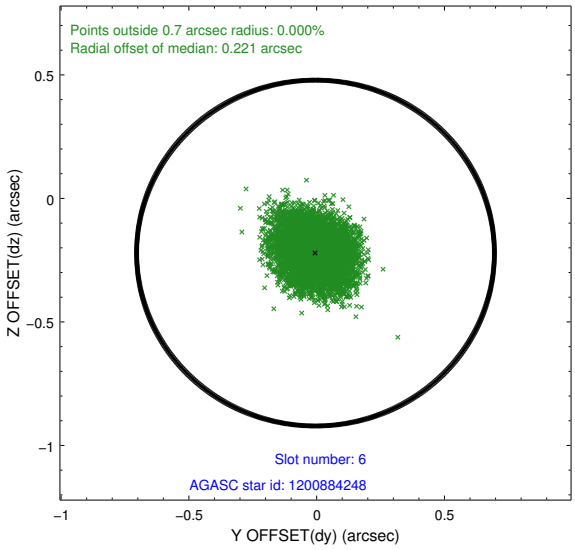

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 1201542672

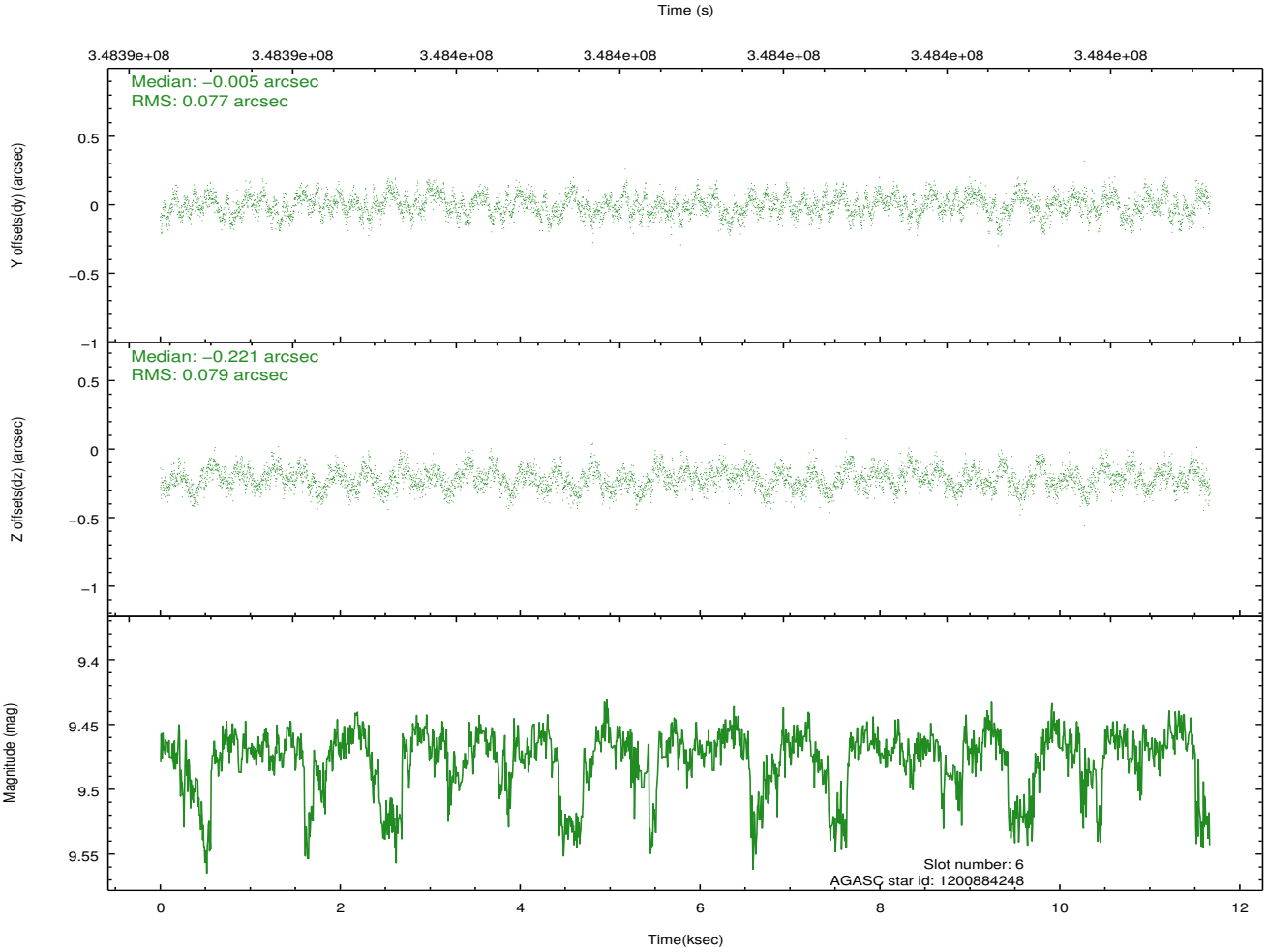

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.136 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 1201542672


Time (s)
Median: –0.110 arcsec
RMS: 0.068 arcsec
Y offsets(dy) (arcsec)
Median: 0.081 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 1201542672
Time(ksec)

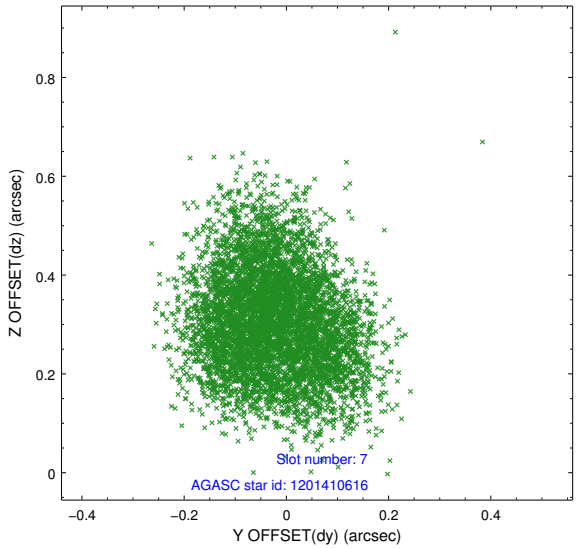
2.4.4 Slot 6

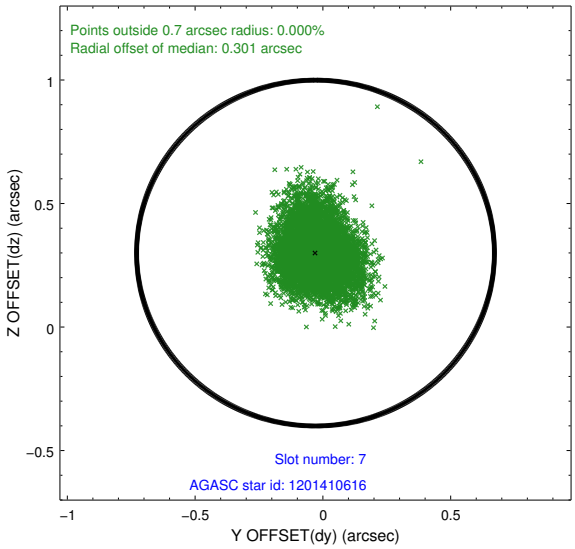

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 1200884248

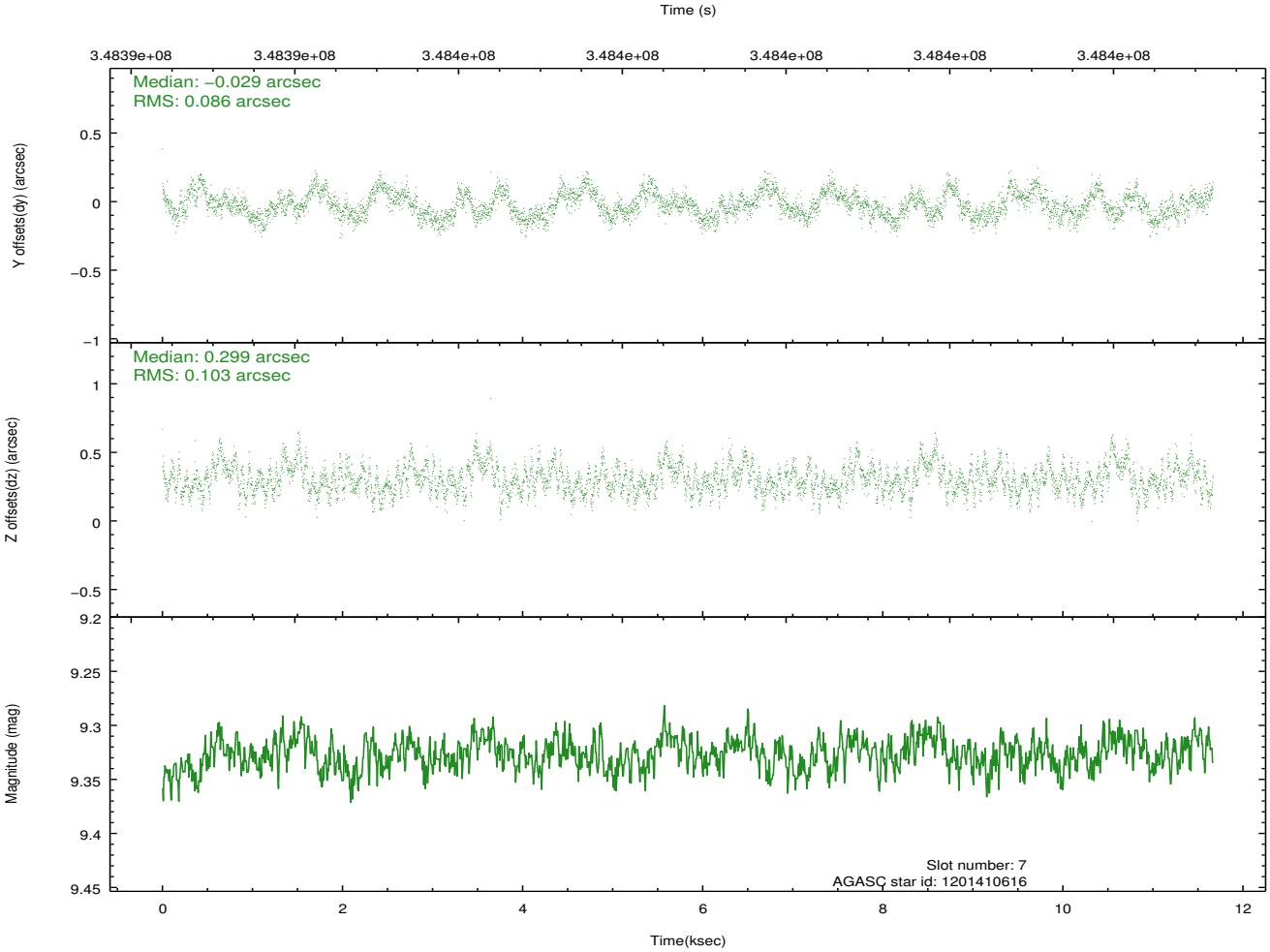

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.221 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 1200884248


Time (s)
Median: −0.005 arcsec
RMS: 0.077 arcsec
Y offsets(dy) (arcsec)
Median: −0.221 arcsec
RMS: 0.079 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 1200884248
Time(ksec)

2.4.5 Slot 7

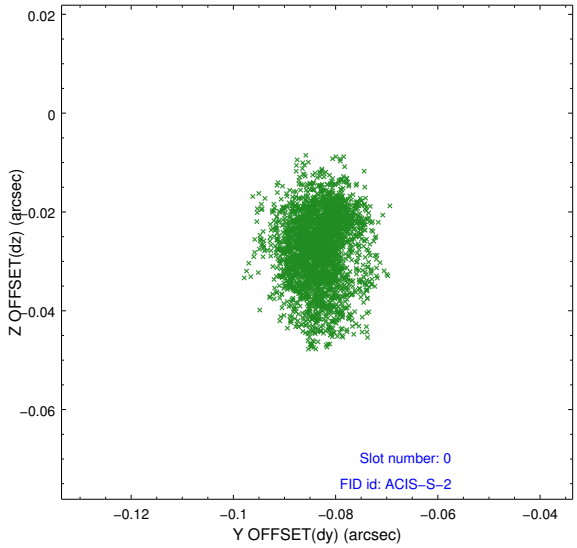

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 1201410616

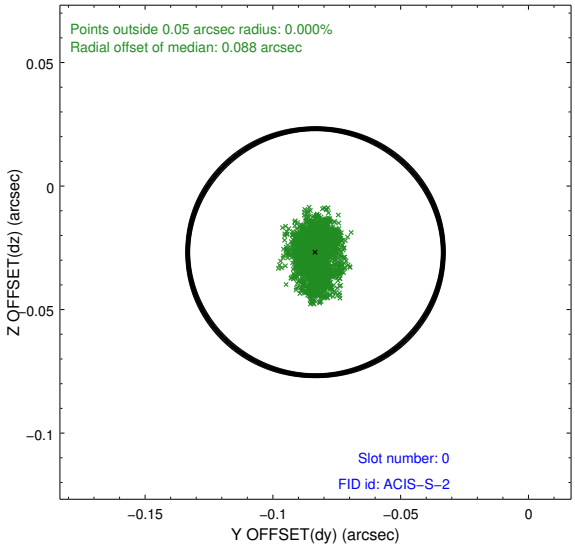

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.301 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 7
AGASC star id: 1201410616

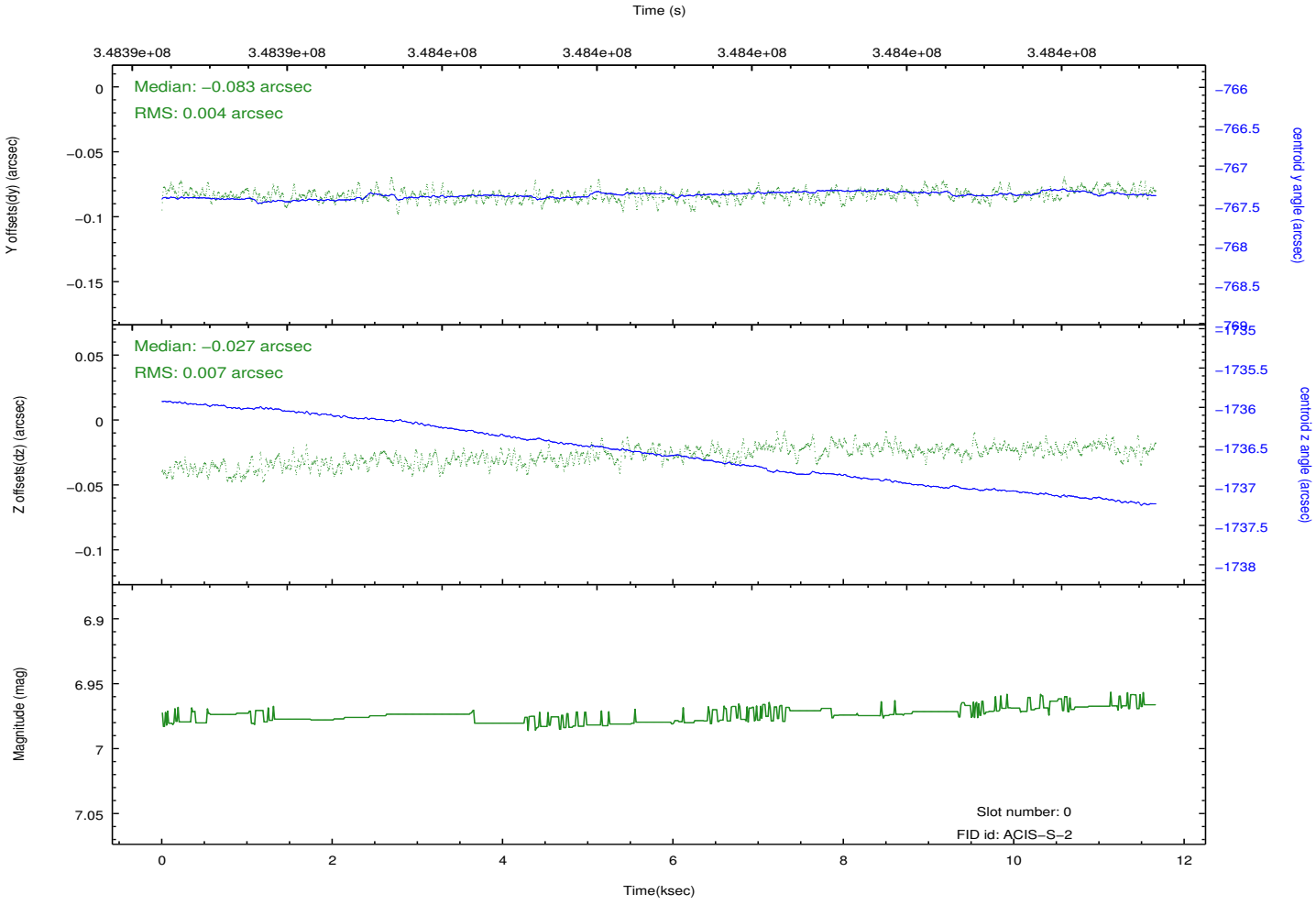

Time (s)
Median: −0.029 arcsec
RMS: 0.086 arcsec
Y offsets(dy) (arcsec)
Median: 0.299 arcsec
RMS: 0.103 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 7
AGASC star id: 1201410616
Time(ksec)

2.5 FID Slots

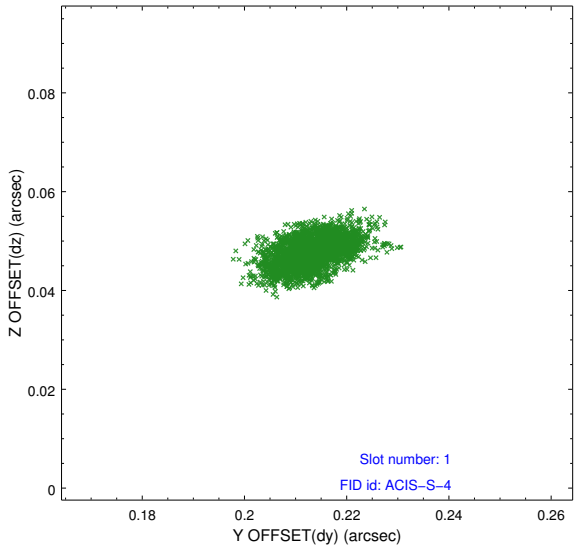
2.5.1 Slot 0

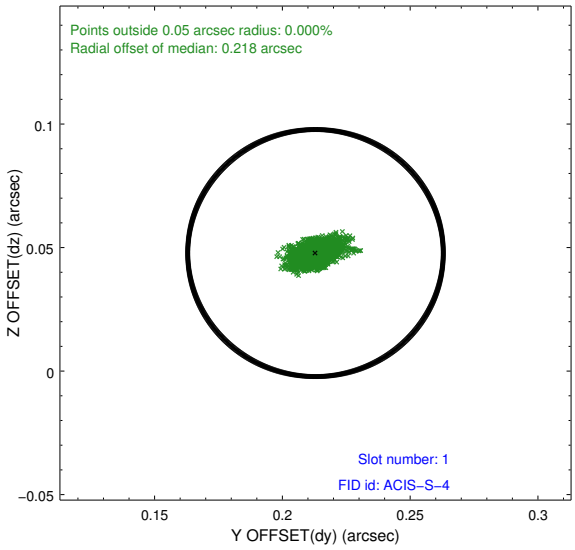


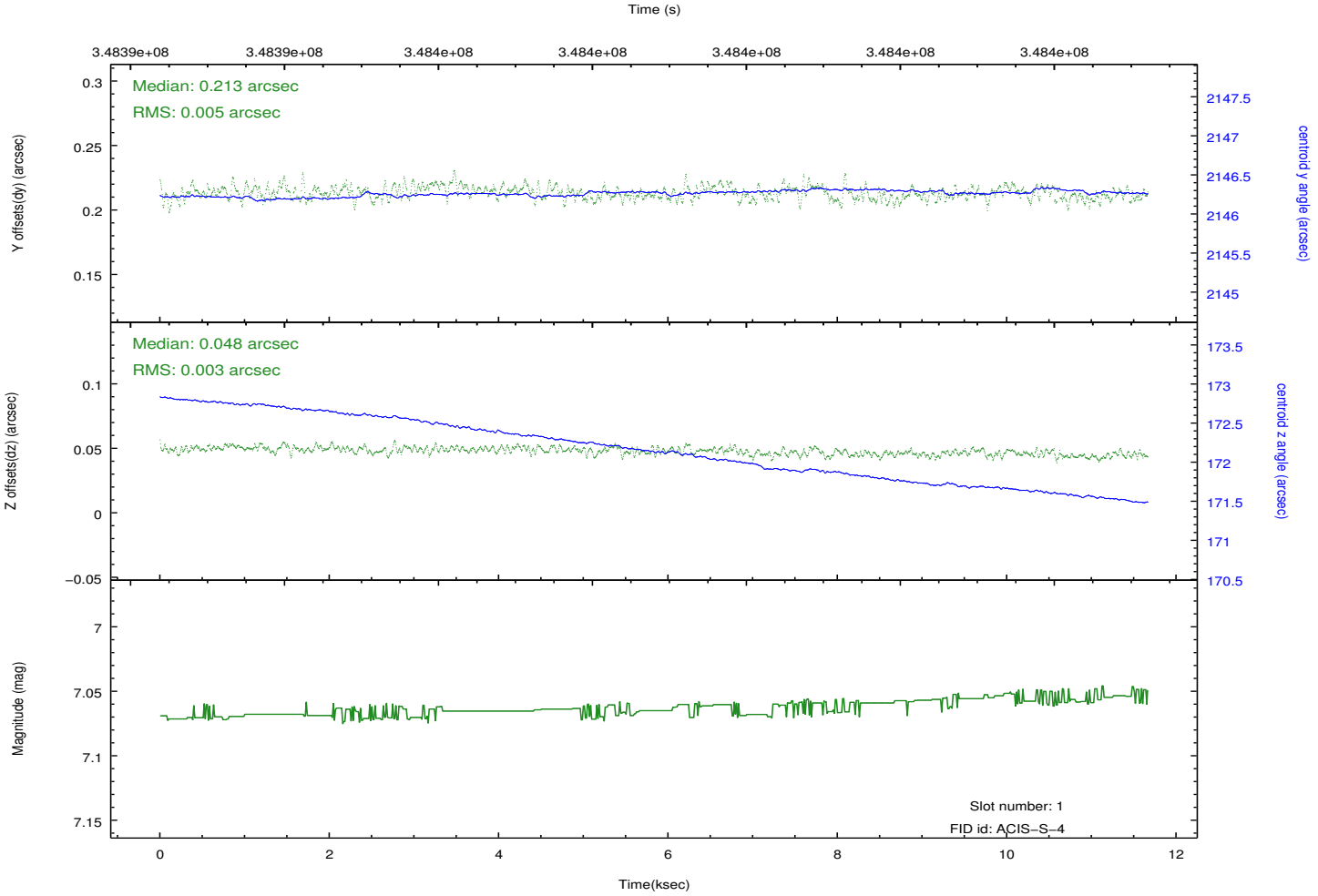




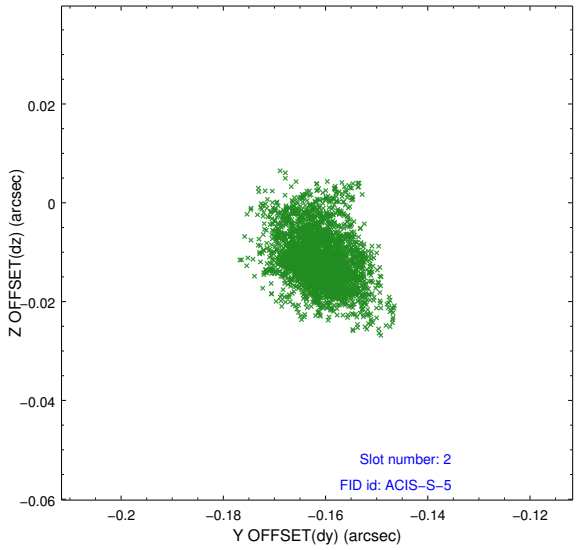
2.5.2 Slot 1

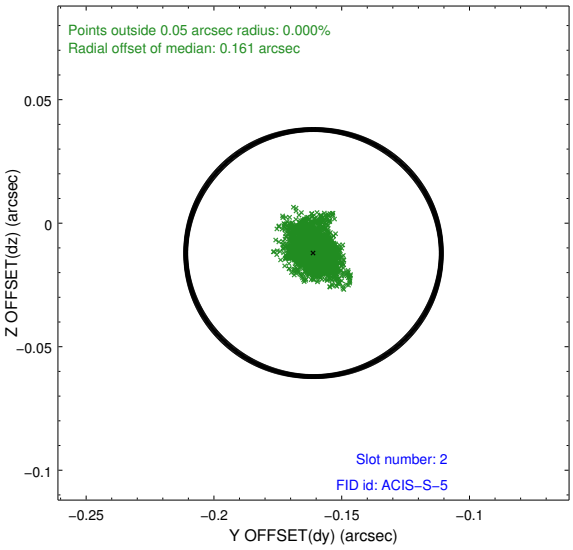

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4

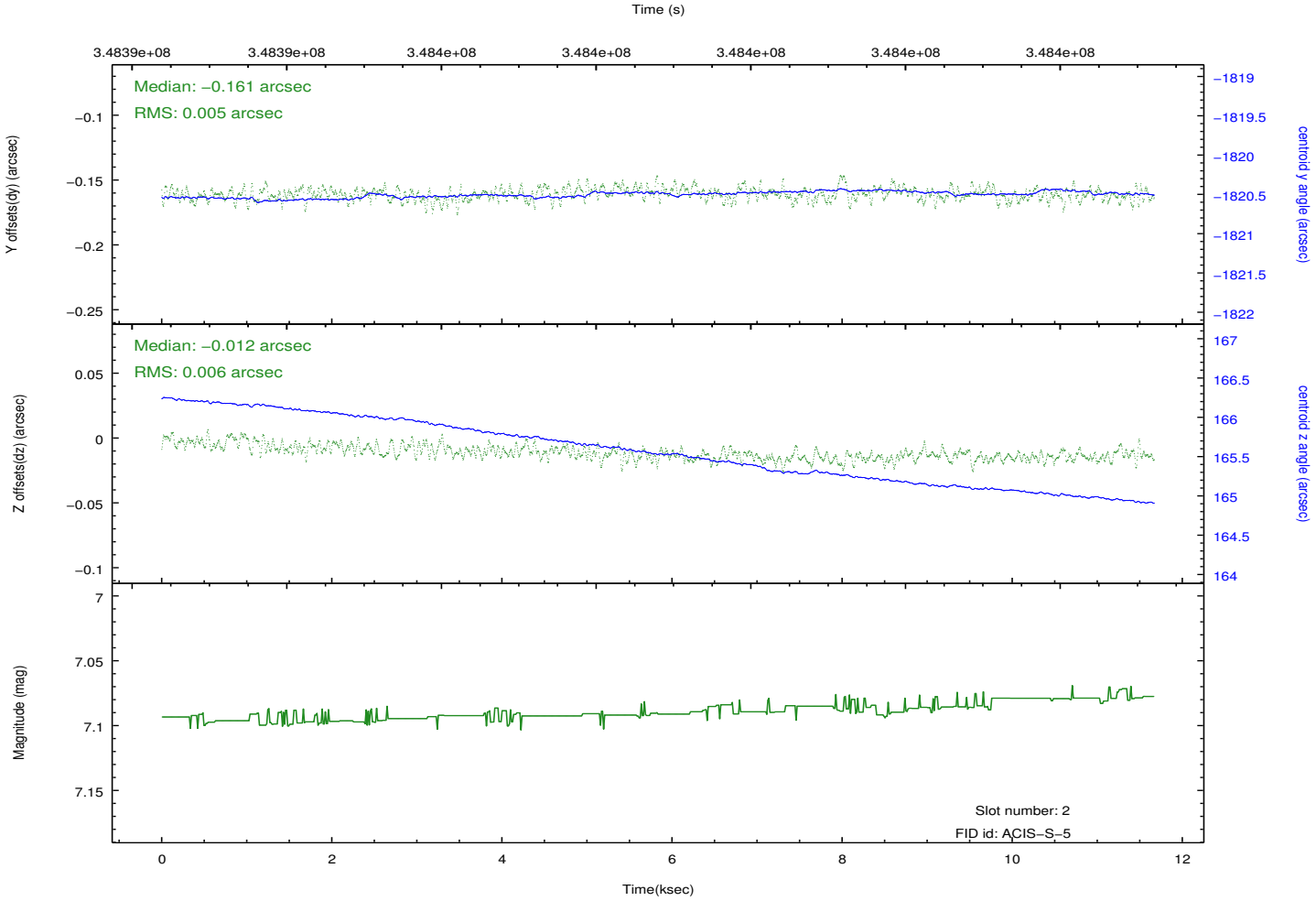

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.218 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 1
FID id: ACIS−S−4


Time (s)
Median: 0.213 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.048 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

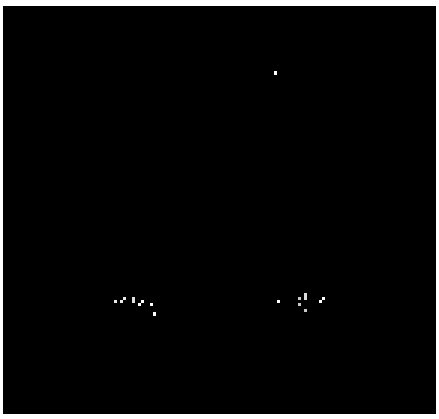

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.161 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5

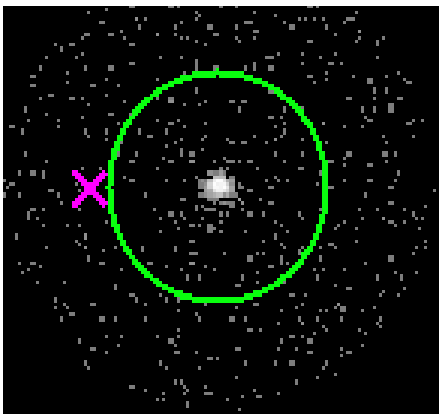

Time (s)
Median: −0.161 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
Median: −0.012 arcsec
RMS: 0.006 arcsec
Z offsets(dz) (arcsec)
centroid y angle (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

3 Gratings

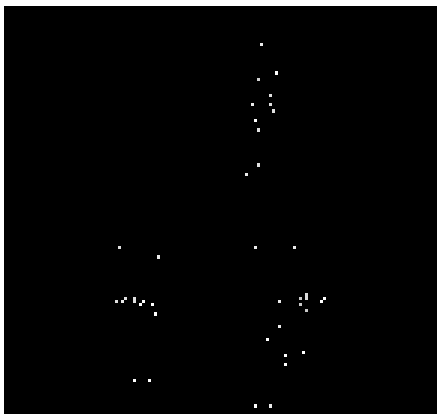
3.1 HEG Arm



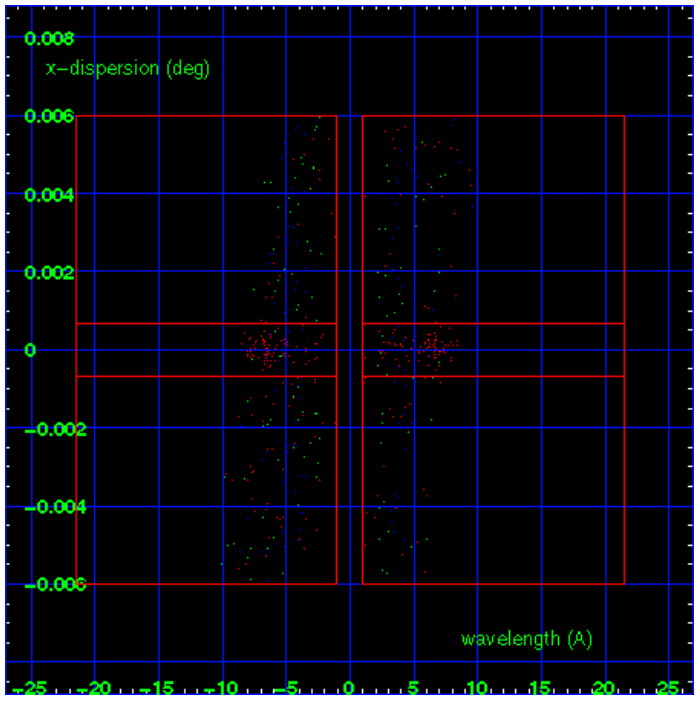
HEG Order Sort 123



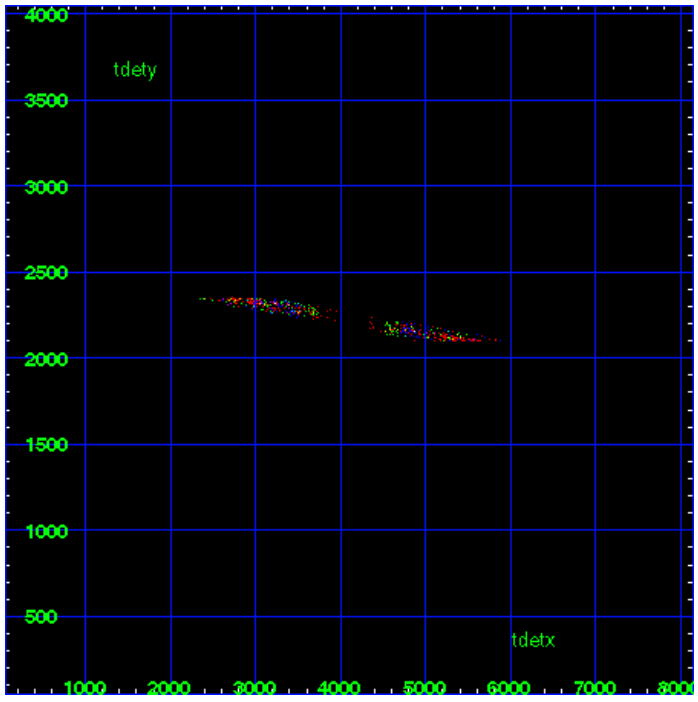
HEG Zero Order



HEG Order Sort ALL

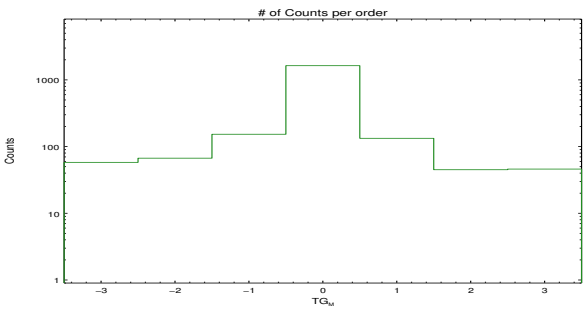


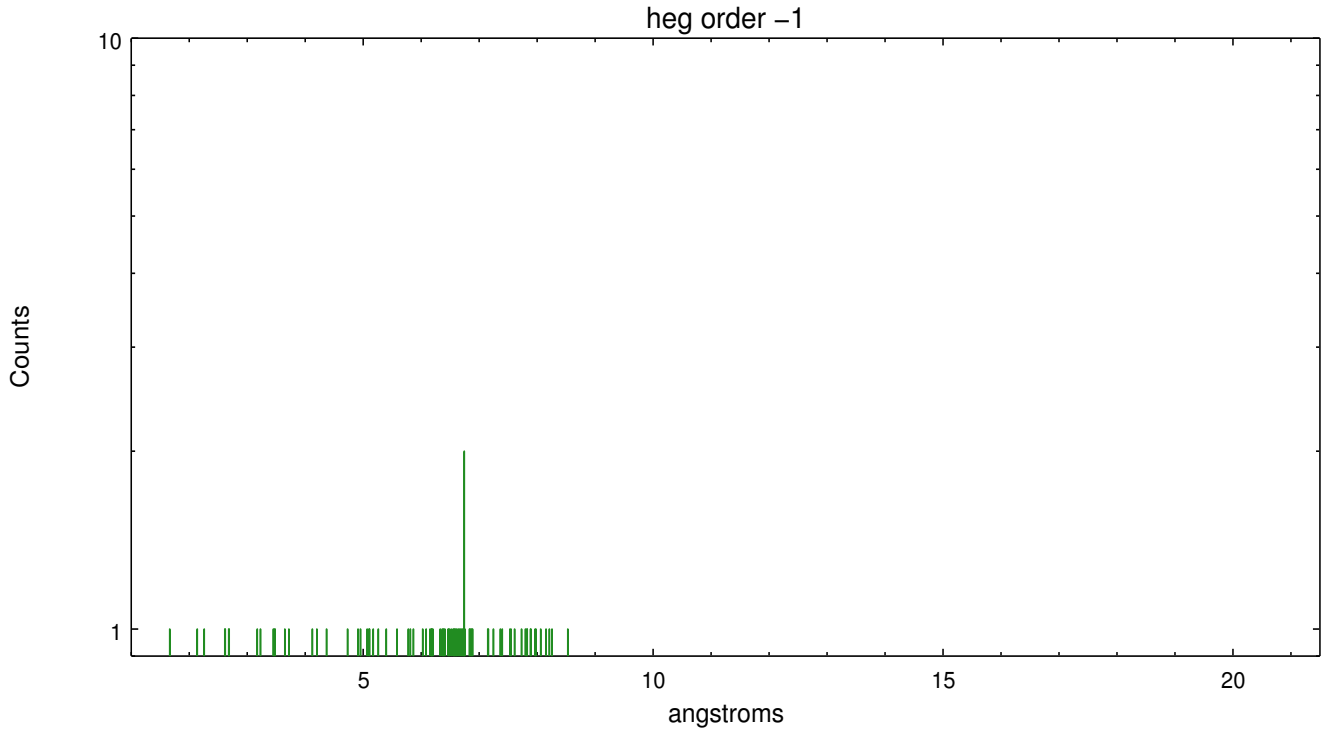
Spot Image HEG

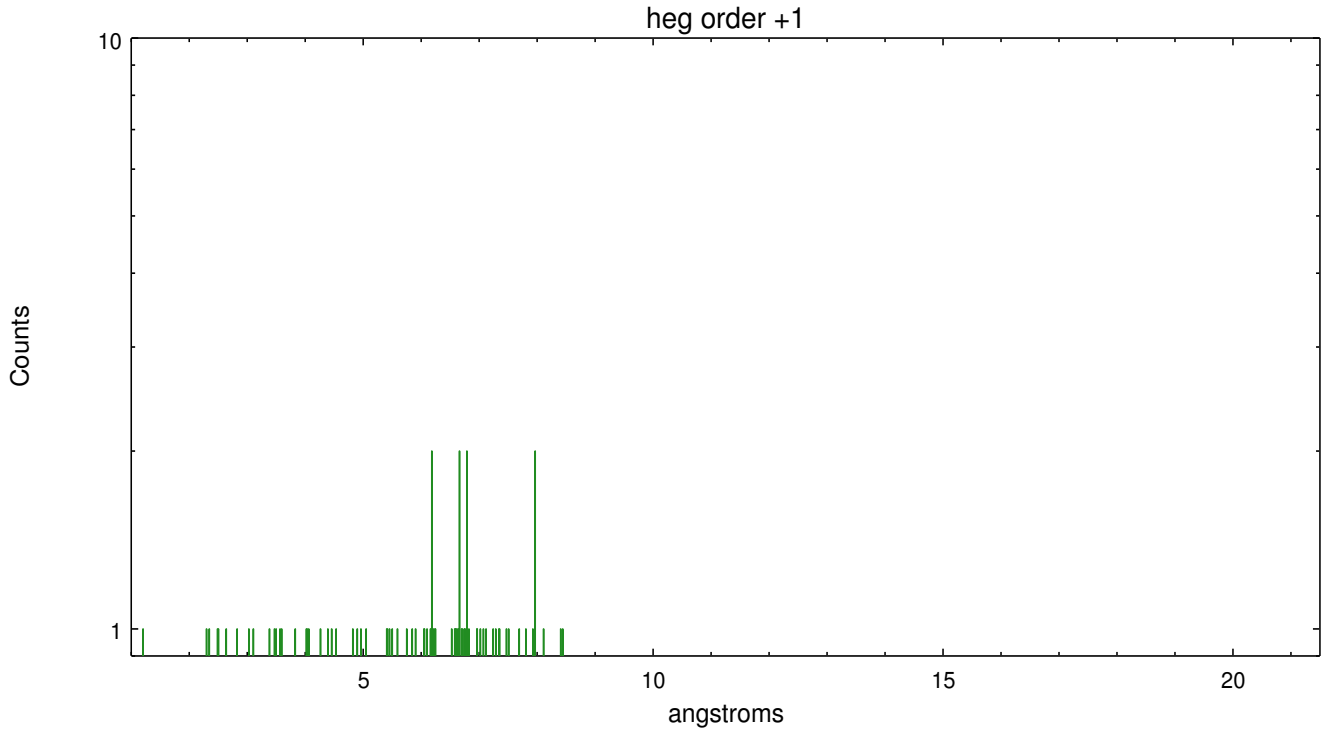


Full Detector HEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	58	67	153	1633	133	45	46

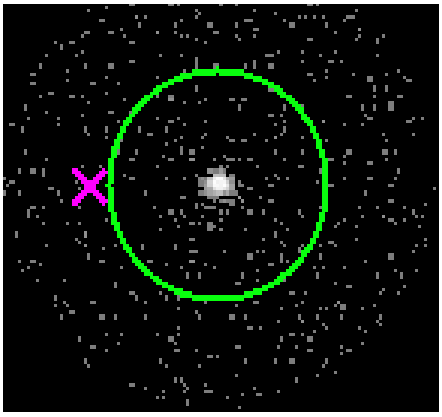



heg order −1
10
1
Counts
5
10
15
20
angstroms


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

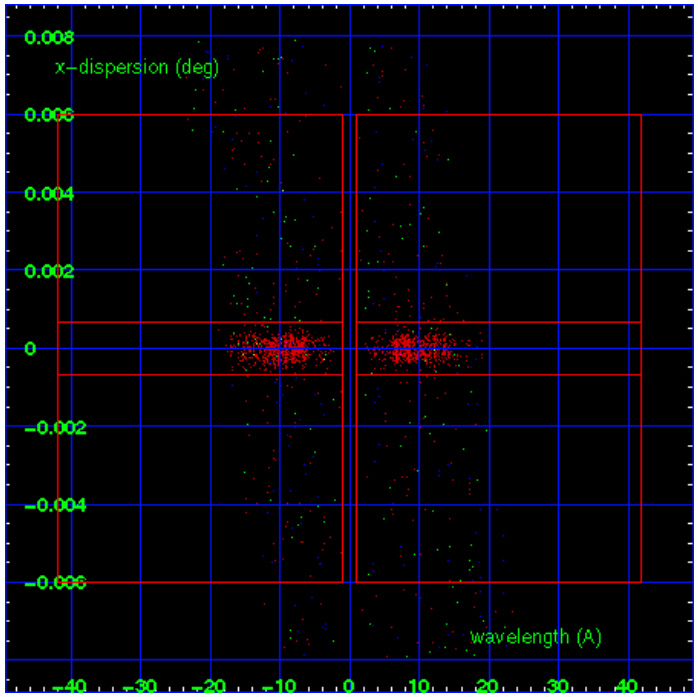
3.2 MEG Arm

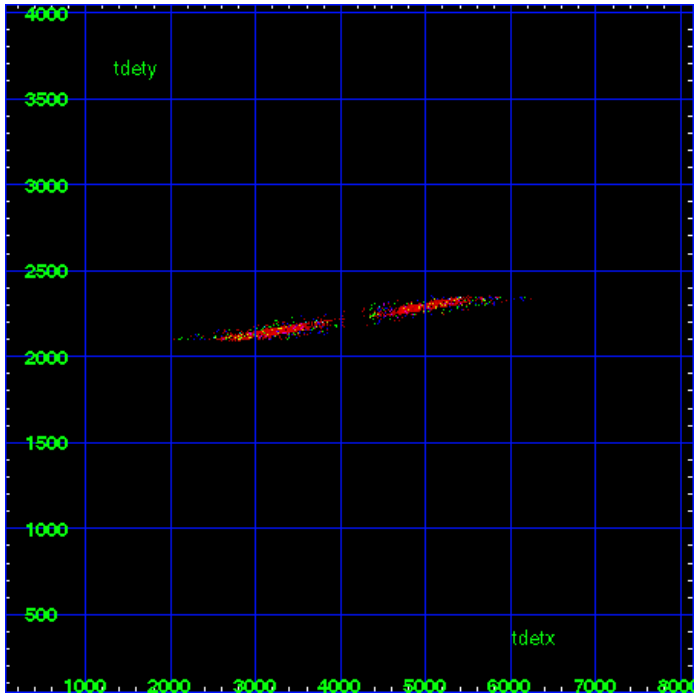
MEG Order Sort 123



MEG Zero Order

MEG Order Sort ALL

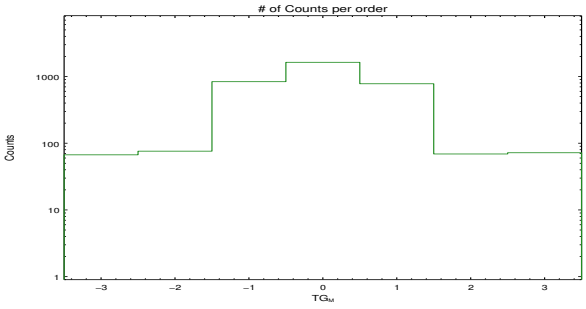


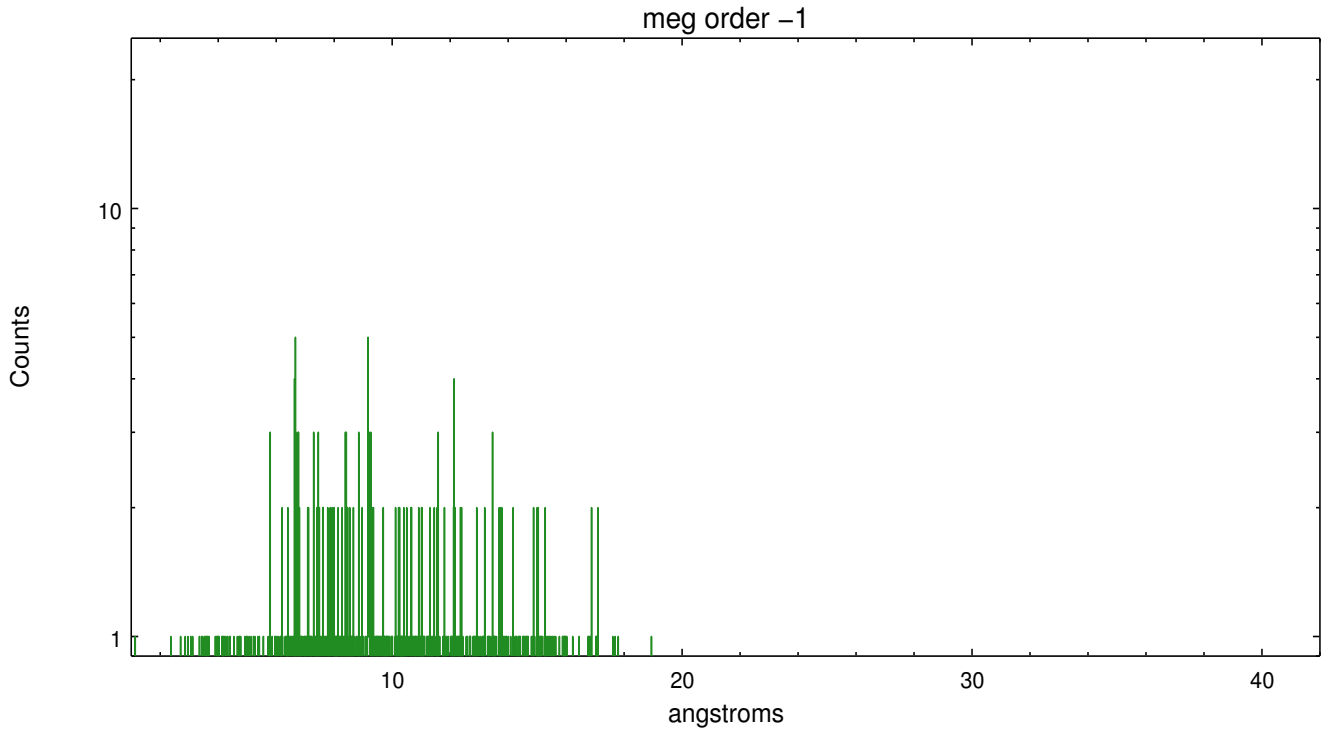


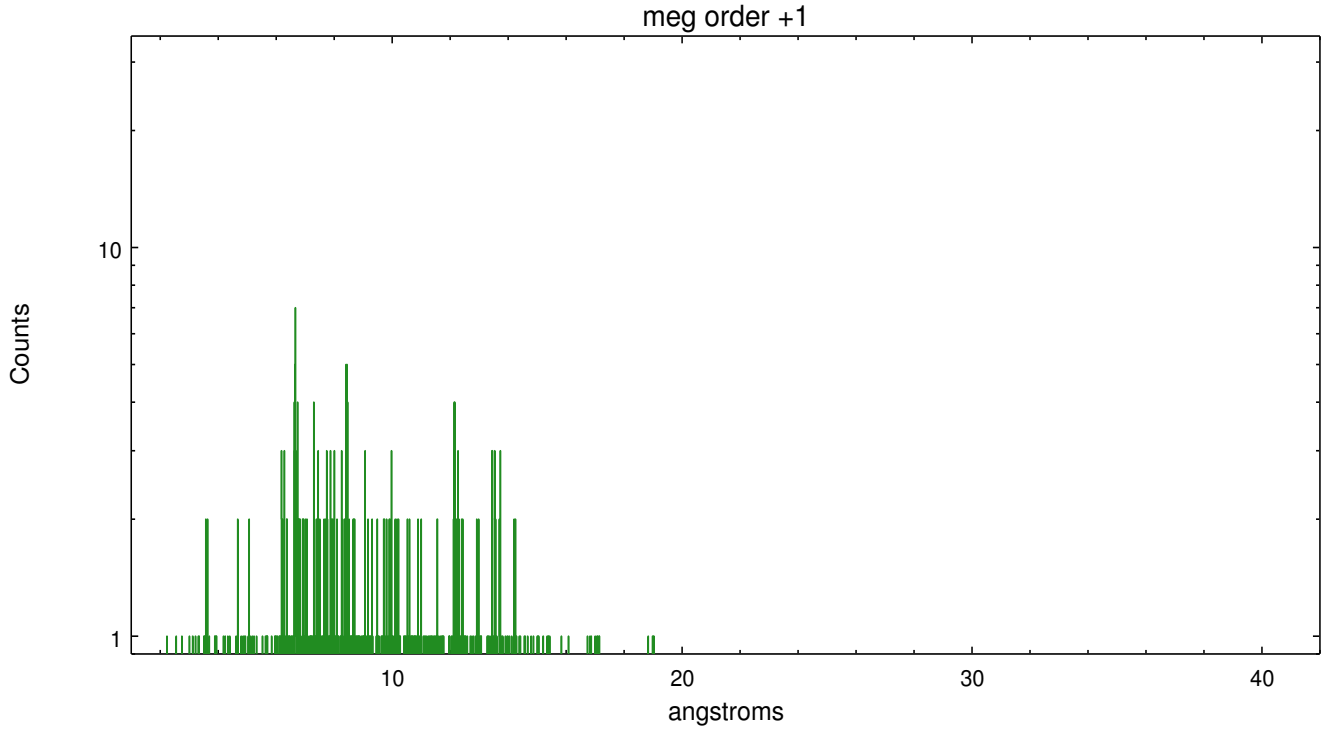
Spot Image MEG

Full Detector MEG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	67	76	837	1633	779	69	72




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


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

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.05.29
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	11.667700252891

A.2 Comments

Source is extended with structure. The zeroth order used for extracting the spectral data in this processing is located at the centroid of the SNR, but is not located at the position of the brightest X-ray emission in the supernova remnant. WARNING: there are no standard ciao tools for analysis of grating spectra from extended sources. The shape of an emission 'line' will be the shape of the zero order spatial structure convolved with the instrumental LSF. Grating extractions can be used, but need to be combined with custom spatial-spectral analysis, since wavelength is multi-valued at any particular diffraction angle.
===
The sub-array configuration chosen eliminates counts from the soft ends of
the spectral arms for both HEG (>9A) and MEG (>19A).
===Obsid 10130 used for cross-calibration purposes. ===