V&V Reference Report
L2 ASCDS Version : 7.6.10

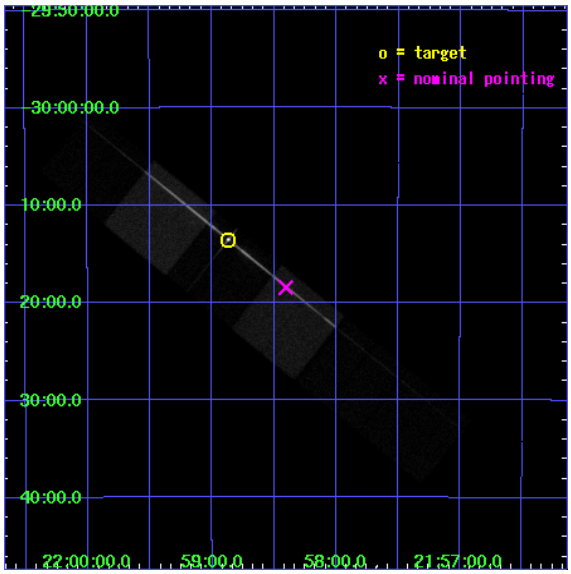
Observation 1796 - L2 Version 4
Chandra X-Ray Center

L2 Processing Date : Jul 27 2007

Contents

1 Front

seq_num	390014
obs_id	1796
title	GRATINGS CALIBRATION OBSERVATIONS OF PKS2155-304
observer	Dr. CXC Calibration
object	PKS2155-304
dtycycle	0
cycle	P
ra_targ	329.716667
dec_targ	-30.225556
ra_nom	329.60127795186
dec_nom	-30.307572921781
roll_nom	38.794436667808
revision	4
ontime	19756.8000184
livetime	19506.62752045
ontime4	19756.8000184
ontime5	19756.8000184
ontime6	19756.8000184
ontime7	19756.8000184
ontime8	19756.8000184
ontime9	19756.8000184
l2events	277960

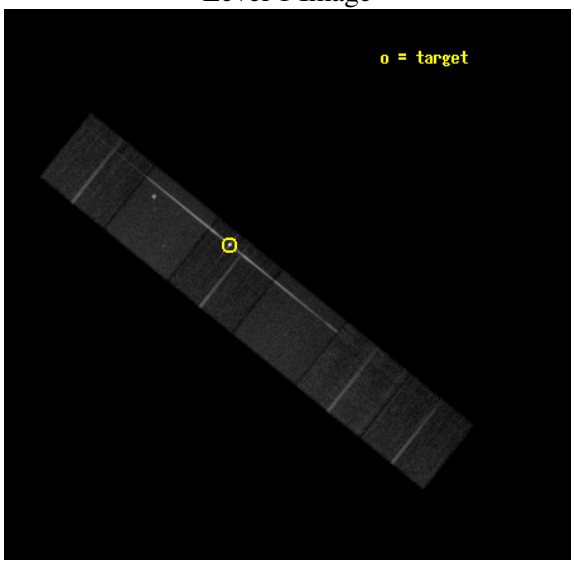


2 OBI

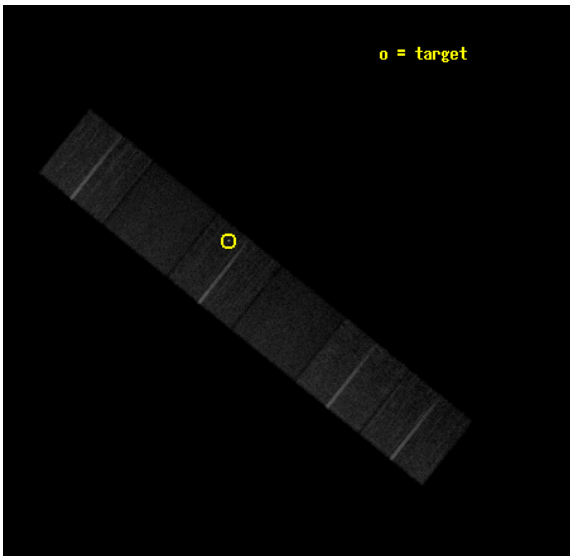
2.1 OBI

2.1.1 Images

Level 1 Image

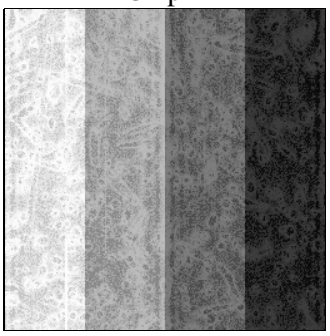


Level 1 Bad Events

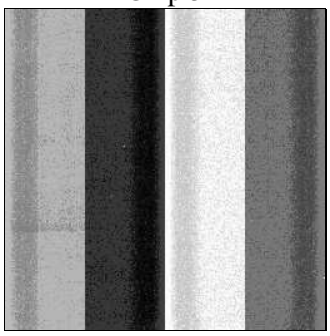


2.1.2 Bias

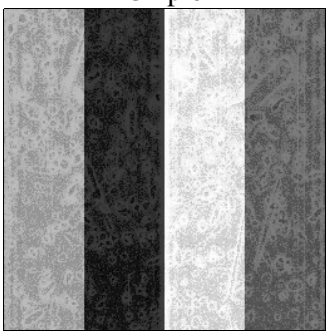
Chip 4



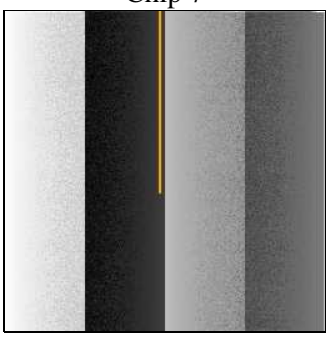
Chip 5



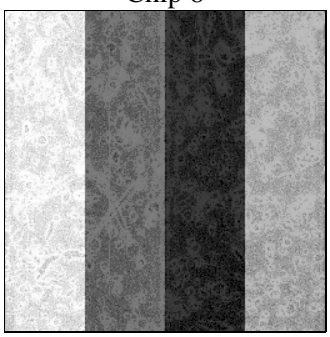
Chip 6



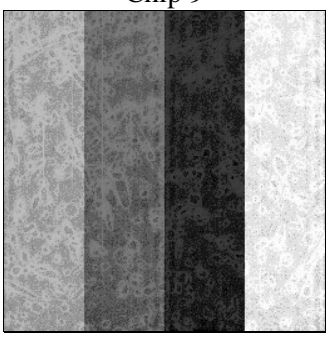
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0
ascdsver	7.6.10
caldbver	3.4.0
date	2007-06-02T06:46:22
revision	3

sched_exp_time	20000.000000
ontime	19756.8000184
ontime4	19756.8000184
ontime5	19756.8000184
ontime6	19756.8000184
ontime7	19756.8000184
ontime8	19756.8000184
ontime9	19756.8000184
l1events	902458

2.1.4 Events

	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
level 1 events	128492	182819	178661	154861	144185	113440
rejected events	114093	81640	101513	80051	116341	100447
rejected %	88%	44%	56%	51%	80%	88%

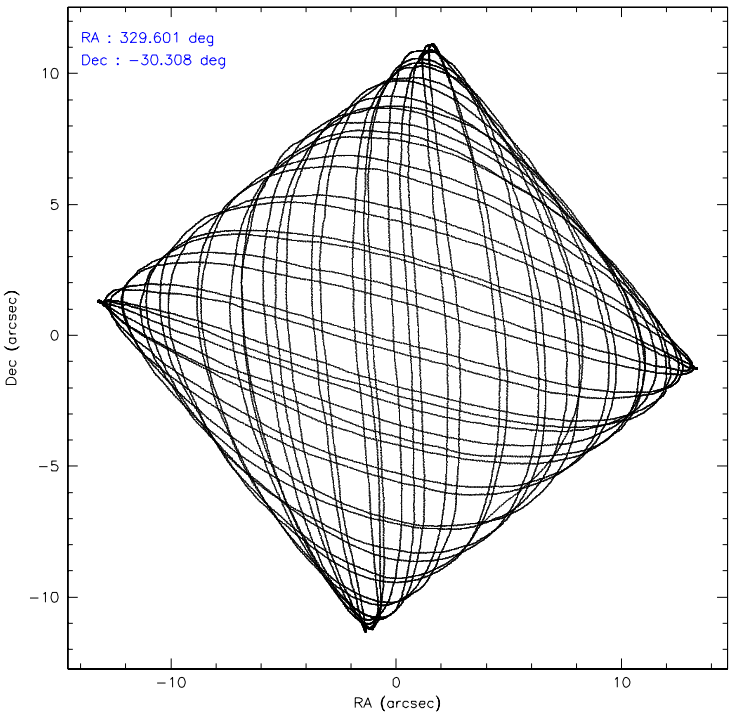
	ccd 4	ccd 5	ccd 6	ccd 7	ccd 8	ccd 9
grade 0 events	6544	23000	58393	13752	9142	5470
	5%	12%	32%	8%	6%	4%
grade 1 events	68	240	900	120	88	45
	0%	0%	0%	0%	0%	0%
grade 2 events	3087	28060	8656	15298	5837	2572
	2%	15%	4%	9%	4%	2%
grade 3 events	1277	6084	3181	7240	2915	1308
	0%	3%	1%	4%	2%	1%
grade 4 events	1205	5925	3130	7011	2589	1200
	0%	3%	1%	4%	1%	1%
grade 5 events	3885	11734	4839	13353	5801	4679
	3%	6%	2%	8%	4%	4%
grade 6 events	2290	38127	3805	31517	7362	2444
	1%	20%	2%	20%	5%	2%
grade 7 events	110136	69649	95757	66570	110451	95722
	85%	38%	53%	42%	76%	84%

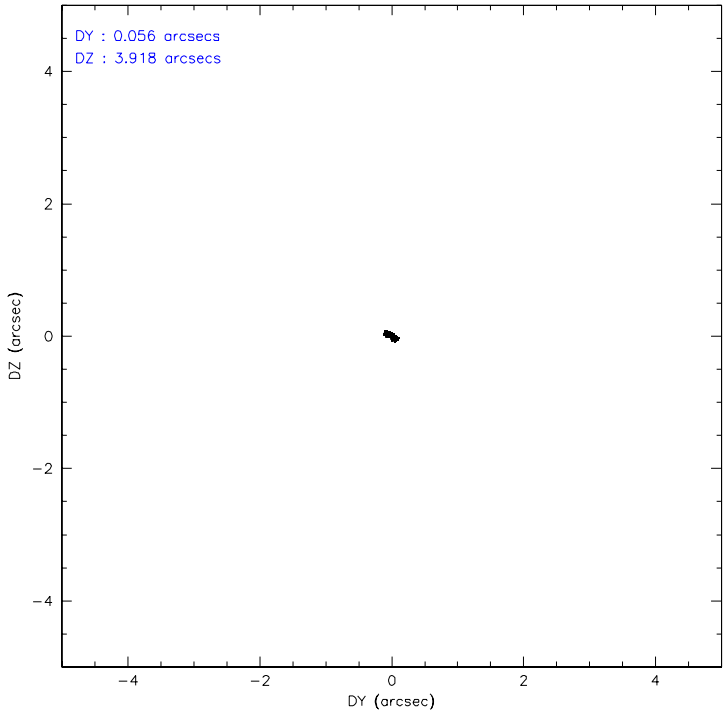
2.2 Compared Parameters

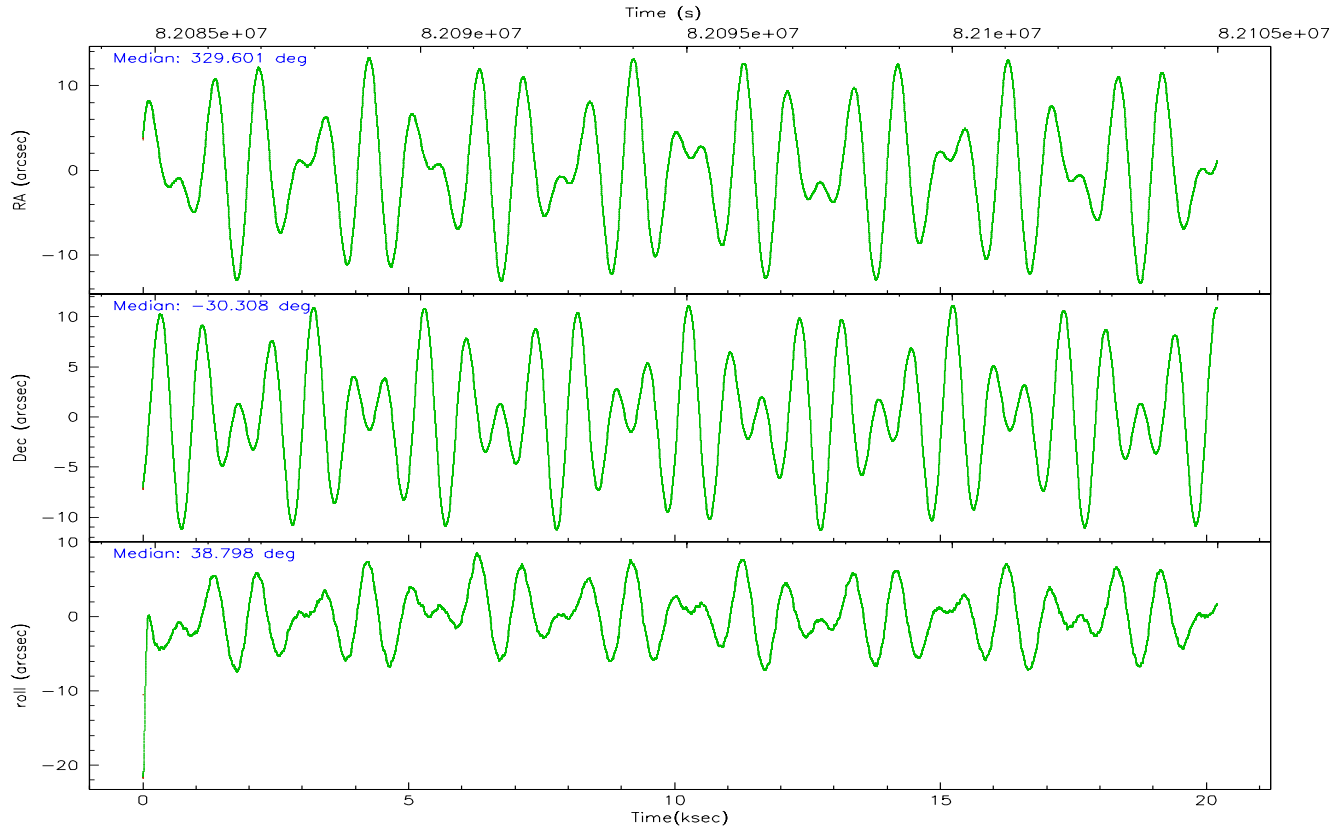
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	LETG	LETG
Data mode	FAINT	FAINT
Observation mode	POINTING	POINTING
Pointing RA	329.589962	329.6012779518638
Pointing Dec	-30.333169	-30.30757292178095
Pointing Roll	38.632112	38.79443666780835
SIM focus pos (mm)	-0.684267	-0.6828225247311905
SIM defocus (mm)	0	0.001444936568705701
SIM translation stage pos (mm)	-182.131972	-182.1344861297048
SIM translation stage offset (mm)	-8.000551	-7.998036453302973
Observation start time	82084983.184000	82084453.06157701
Observation start date	2000-08-08T01:21:59	2000-08-08T01:14:13
Observation end time	82104983.184000	82105117.06234699
Observation end date	2000-08-08T06:55:19	2000-08-08T06:58:37
Read mode	TIMED	TIMED

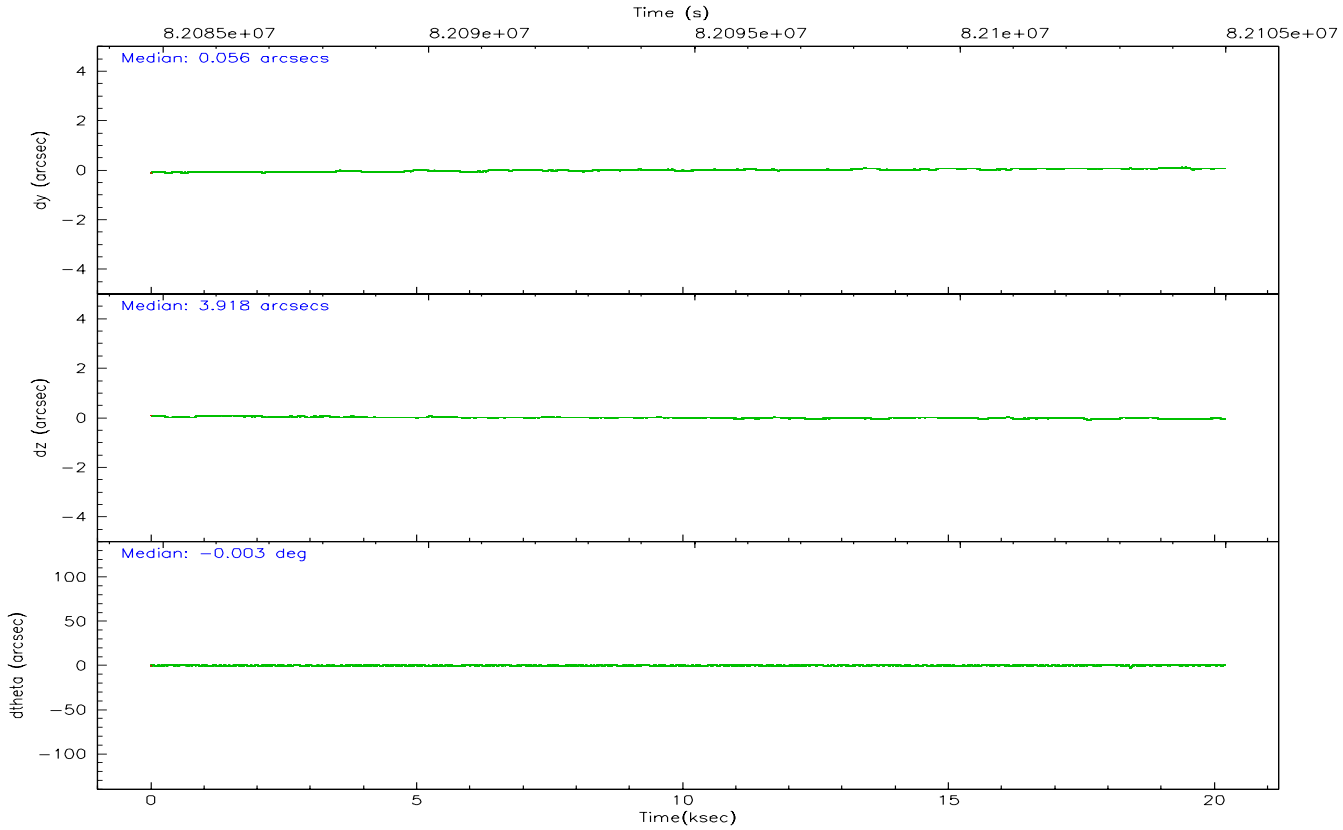
Parameter	Planned	Actual
Obspar format version number	6	6
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
Primary exposure time	0.000000	3.2

2.3 Aspect


RA : 329.601 deg
Dec : −30.308 deg
10
5
0
−5
−10
Dec (arcsec)
−10
0
10
RA (arcsec)


DY : 0.056 arcsecs
DZ : 3.918 arcsecs
4
2
0
−2
−4
DZ (arcsec)
−4
−2
0
2
4
DY (arcsec)


Time (s)
8.2085e+07
8.209e+07
8.2095e+07
8.21e+07
8.2105e+07
Median: 329.601 deg
RA (arcsec)
Median: −30.308 deg
Dec (arcsec)
Median: 38.798 deg
roll (arcsec)
Time(ksec)

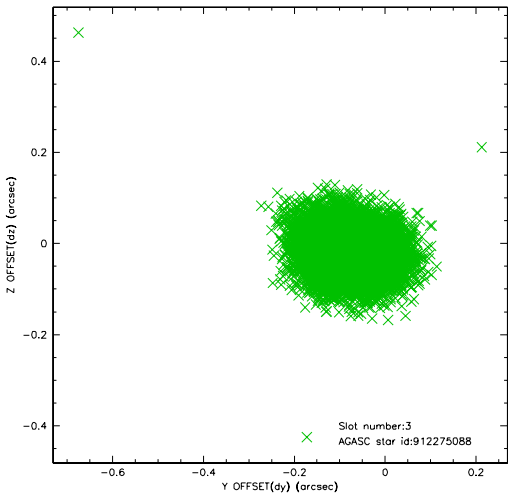

Time (s)
8.2085e+07
8.209e+07
8.2095e+07
8.21e+07
8.2105e+07
Median: 0.056 arcsecs
dy (arcsec)
Median: 3.918 arcsecs
dz (arcsec)
Median: −0.003 deg
dtheta (arcsec)
Time(ksec)

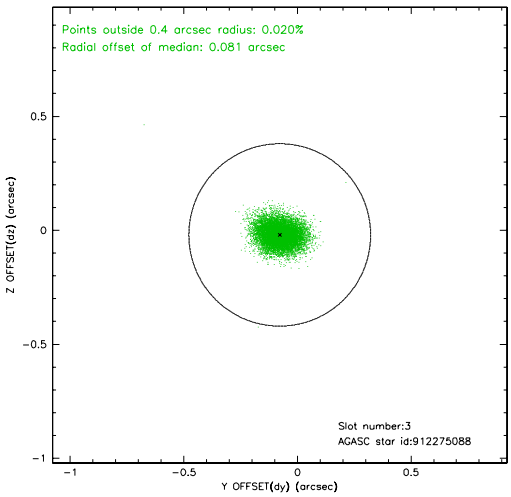
Slot Statistics

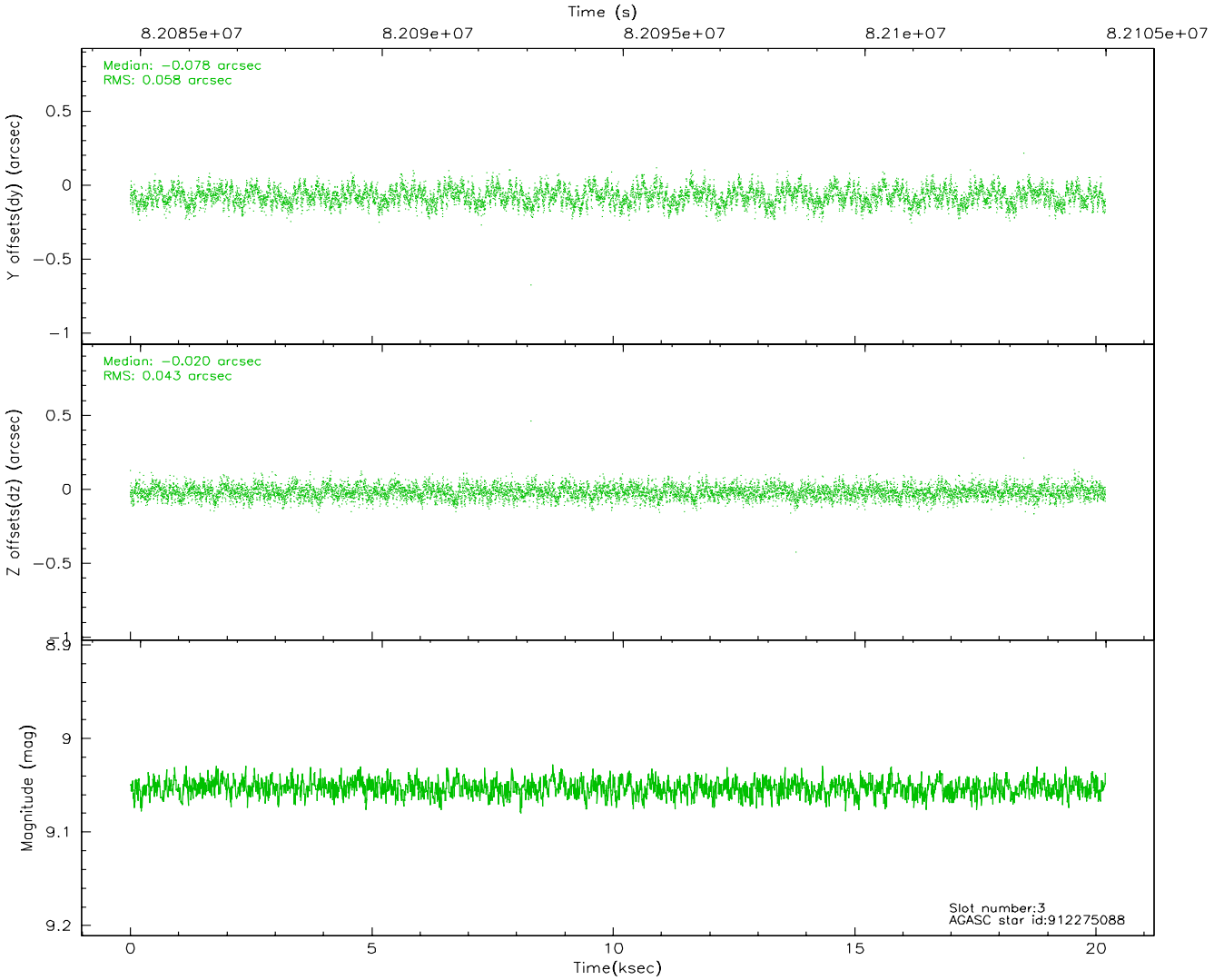
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.10	4927	-0.045	-0.085	0.007	0.011	0.000000	0.000000	-752.12	-1889.84
1	FID	ACIS-S-4	7.18	4925	0.034	0.044	0.005	0.009	0.000000	0.000000	2161.19	18.48
2	FID	ACIS-S-5	7.22	4925	-0.020	0.048	0.007	0.012	0.000000	0.000000	-1804.67	12.44
3	GUIDE	912275088	9.05	9849	-0.078	-0.020	0.077	0.123	329.619228	-29.738698	1407.47	1615.38
4	GUIDE	981468288	9.21	9784	0.070	-0.001	0.119	0.191	328.608359	-30.257017	-2221.39	2110.46
5	GUIDE	981478152	9.40	9844	-0.035	0.039	0.080	0.129	329.415589	-30.057192	195.26	1116.03
6	GUIDE	981468128	9.35	9791	0.076	-0.042	0.077	0.127	329.756350	-30.158334	797.23	168.79
7	GUIDE	981469488	9.60	9847	-0.022	0.021	0.085	0.139	329.261199	-30.045155	-153.90	1449.27

2.4 Star Slots

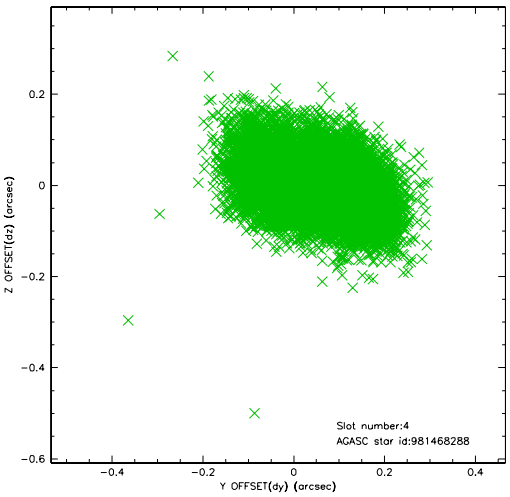
2.4.1 Slot 3

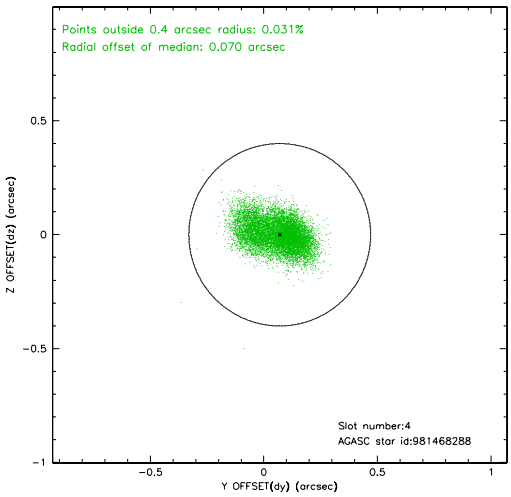


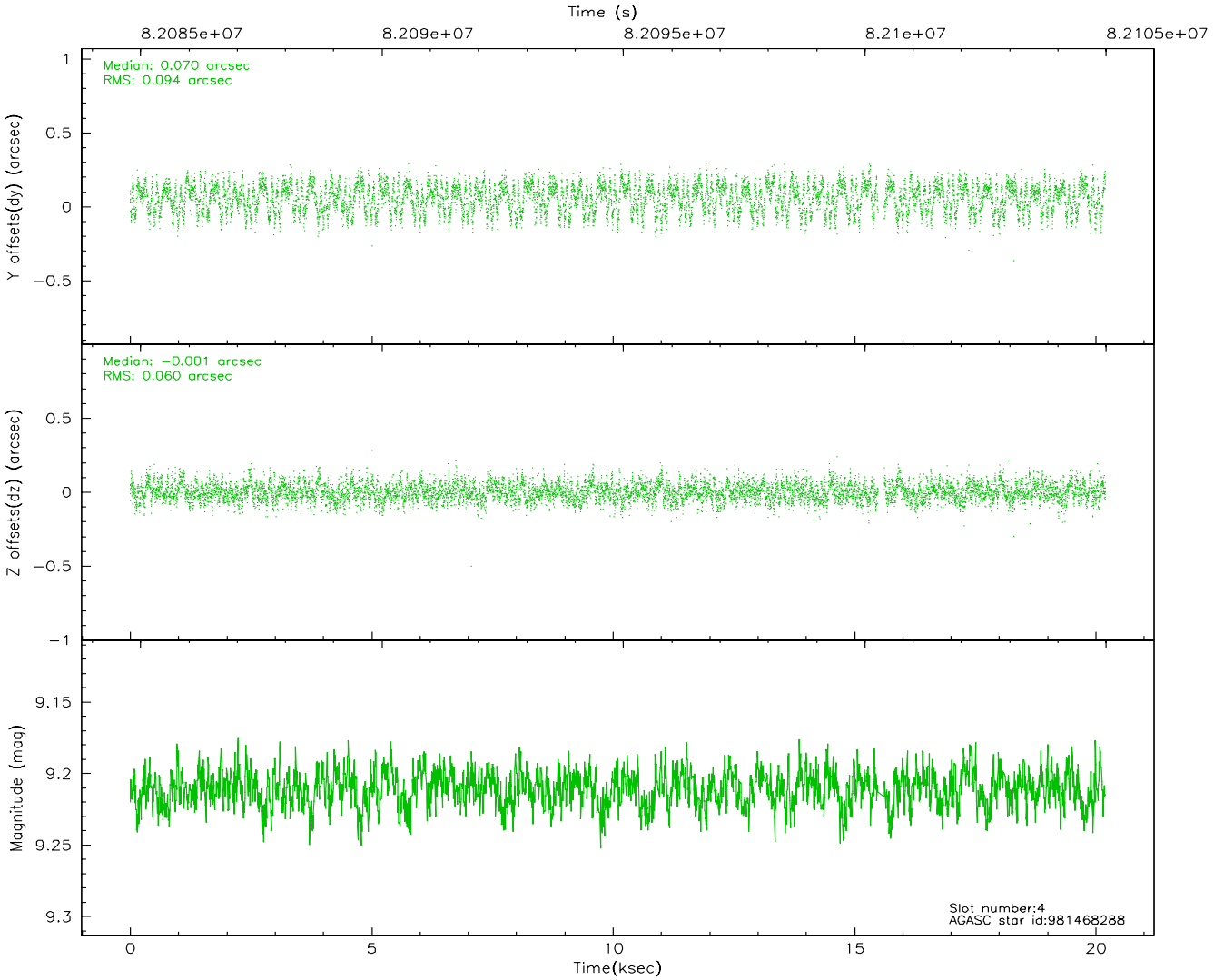




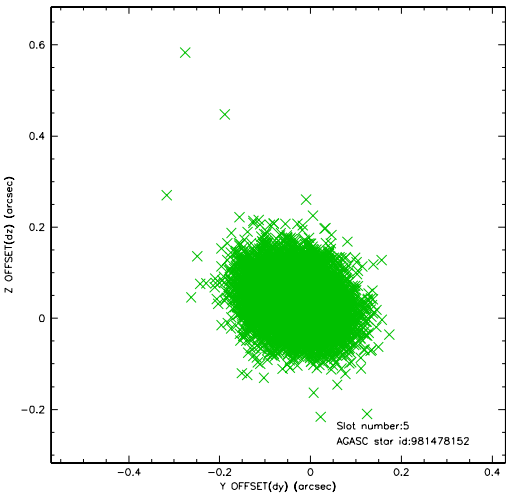
2.4.2 Slot 4

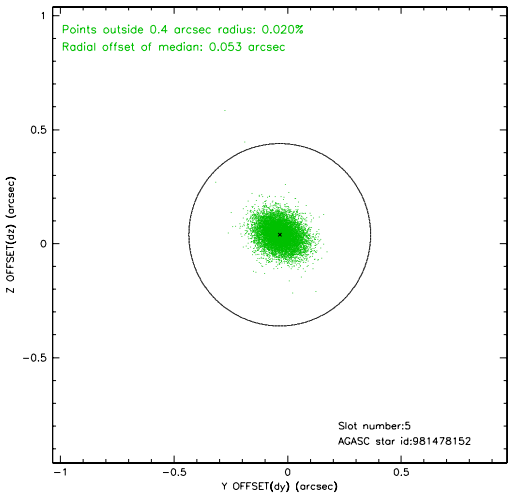

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:981468288

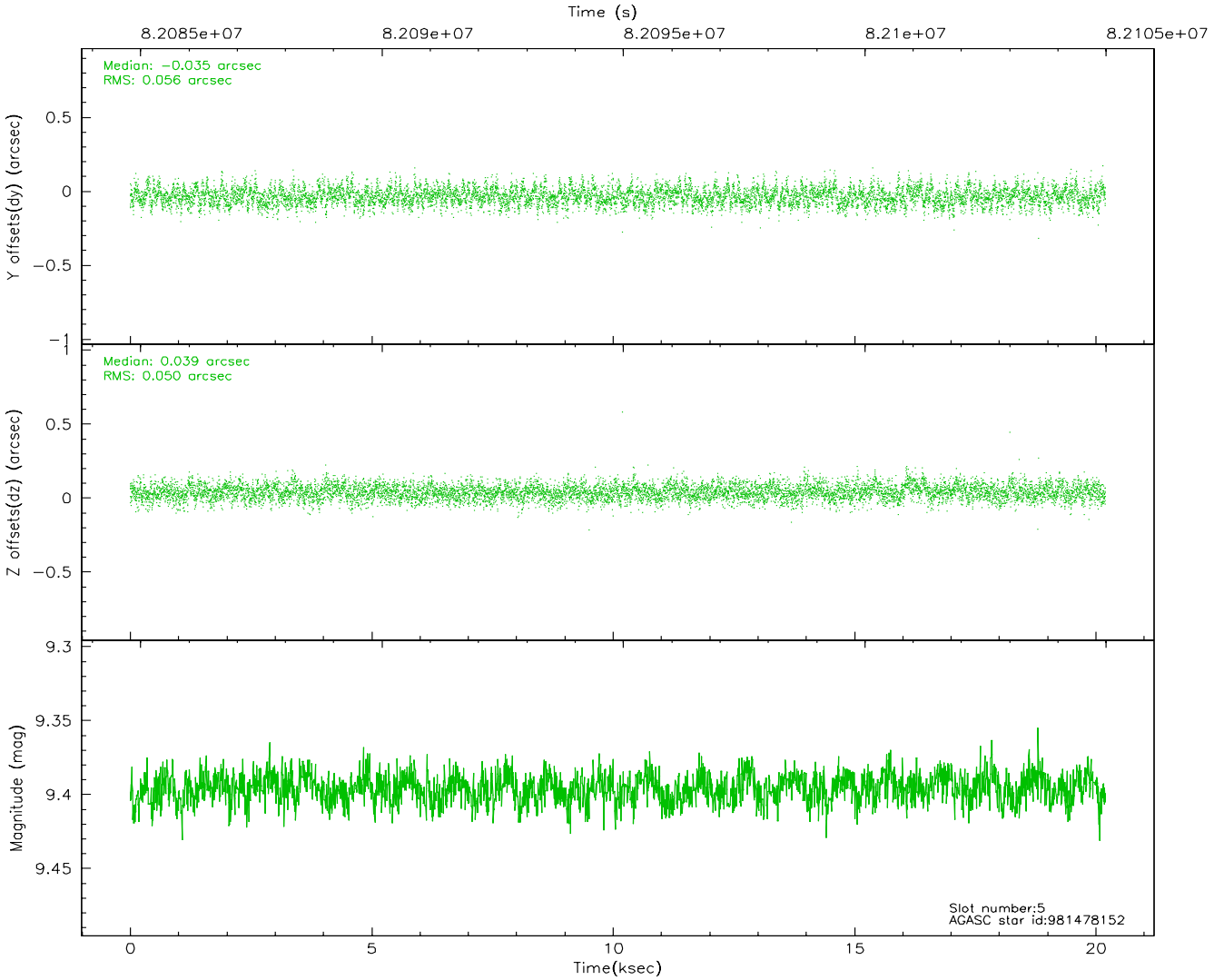

Points outside 0.4 arcsec radius: 0.031%
Radial offset of median: 0.070 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:4
AGASC star id:981468288


Time (s)
8.2085e+07
8.209e+07
8.2095e+07
8.21e+07
8.2105e+07
Median: 0.070 arcsec
RMS: 0.094 arcsec
Y offsets(dy) (arcsec)
Median: −0.001 arcsec
RMS: 0.060 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:4
AGASC star id:981468288
Time(ksec)

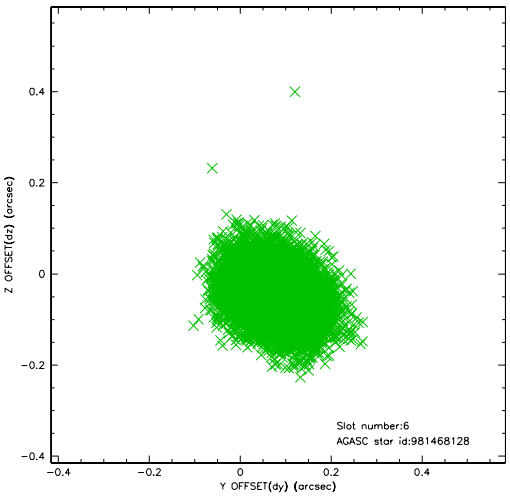
2.4.3 Slot 5

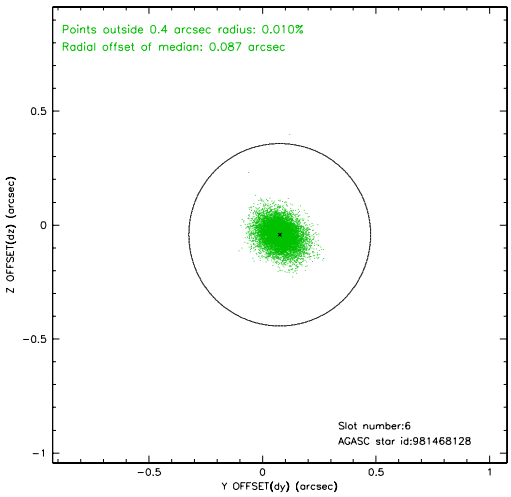

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:981478152

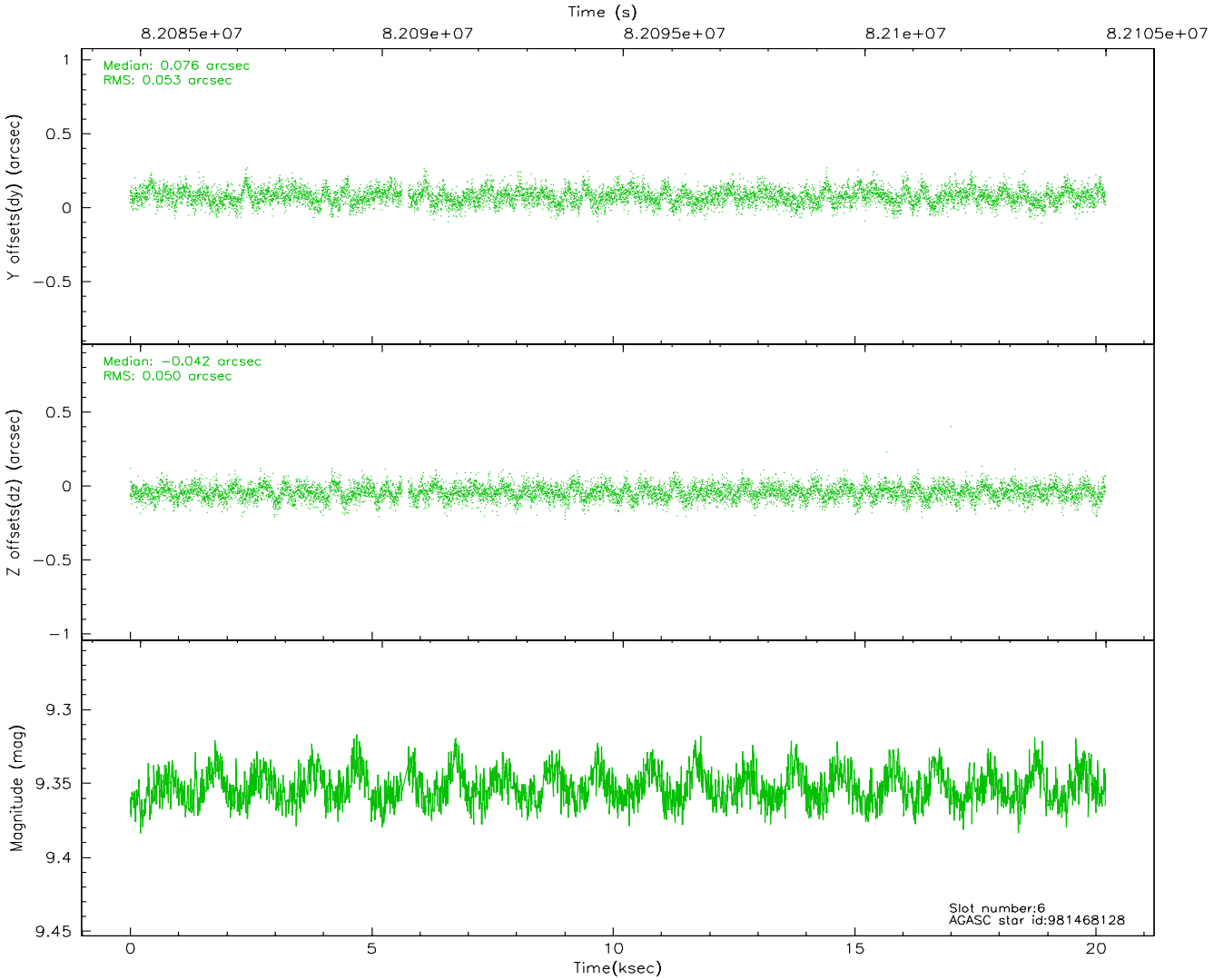

Points outside 0.4 arcsec radius: 0.020%
Radial offset of median: 0.053 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:5
AGASC star id:981478152


Time (s)
Median: −0.035 arcsec
RMS: 0.056 arcsec
Y offsets(dy) (arcsec)
Median: 0.039 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:5
AGASC star id:981478152
Time(ksec)

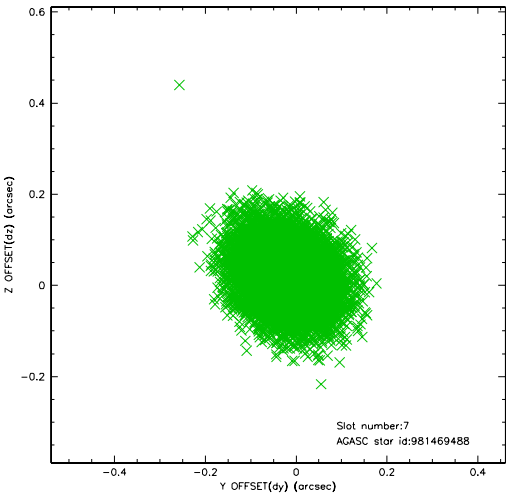
2.4.4 Slot 6

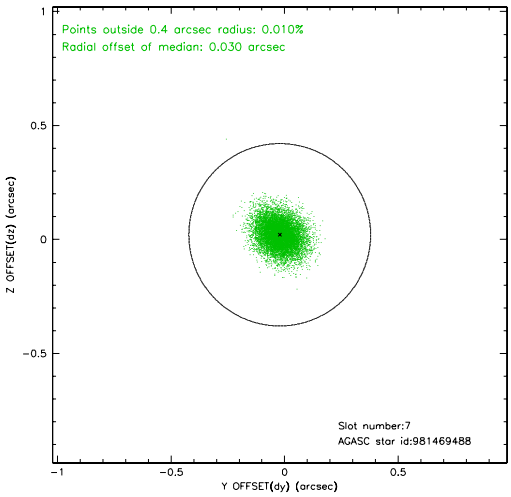

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:981468128

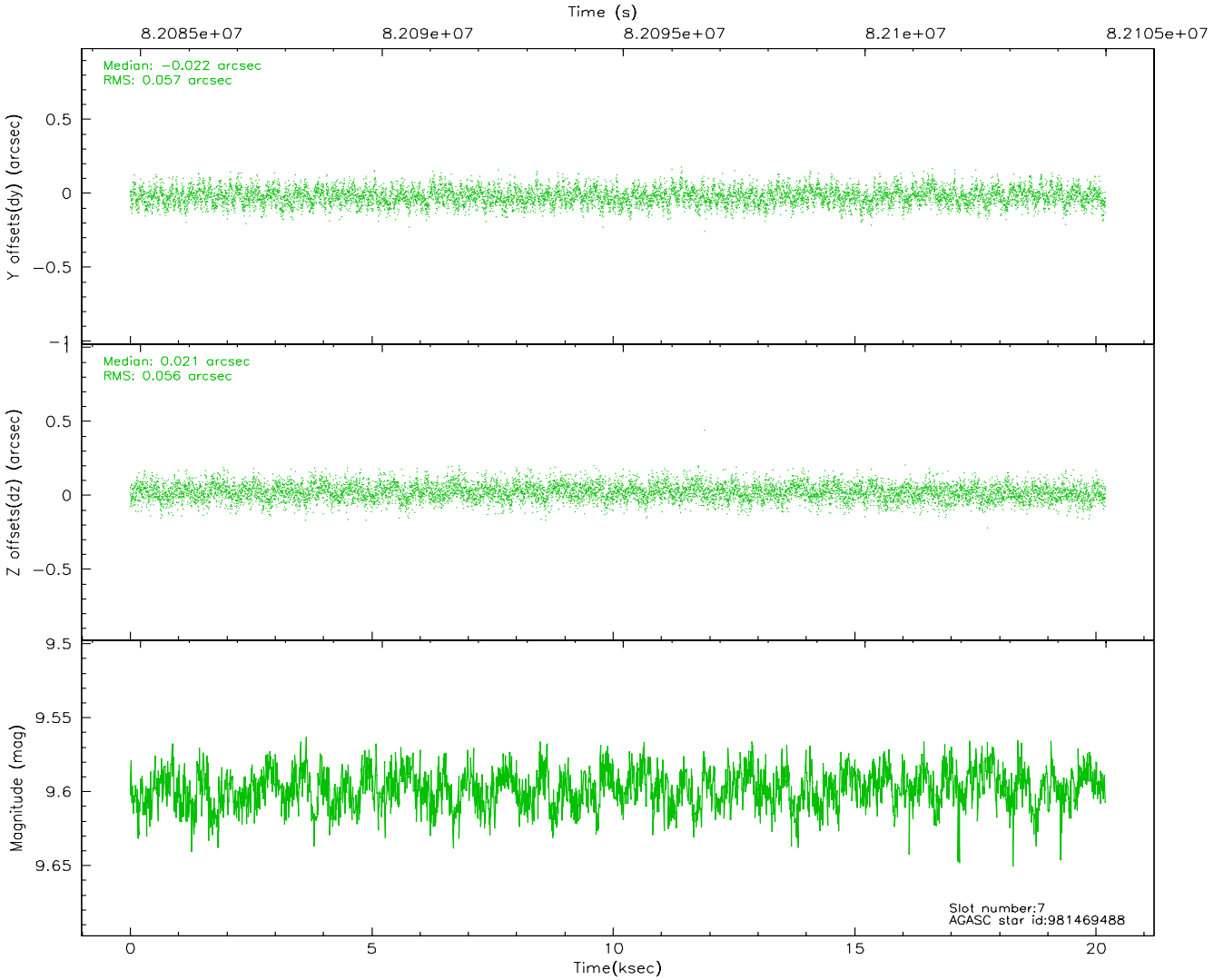

Points outside 0.4 arcsec radius: 0.010%
Radial offset of median: 0.087 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:6
AGASC star id:981468128


Time (s)
Median: 0.076 arcsec
RMS: 0.053 arcsec
Y offsets(dy) (arcsec)
Median: −0.042 arcsec
RMS: 0.050 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:6
AGASC star id:981468128
Time(ksec)

2.4.5 Slot 7

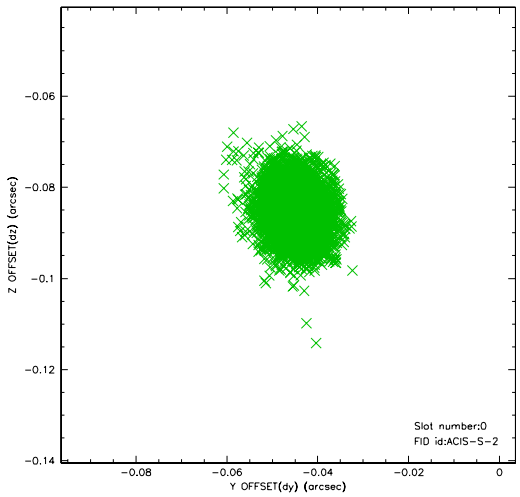

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:981469488

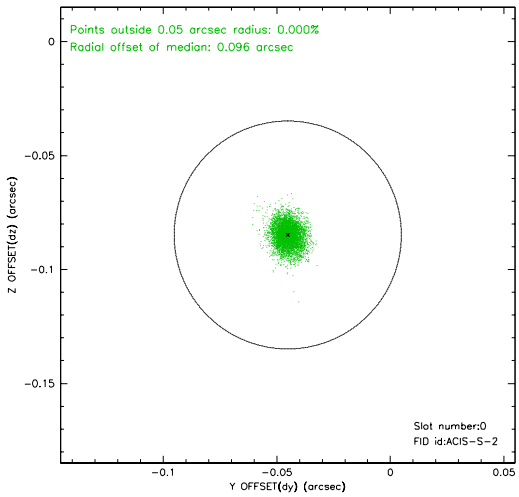

Points outside 0.4 arcsec radius: 0.010%
Radial offset of median: 0.030 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:7
AGASC star id:981469488

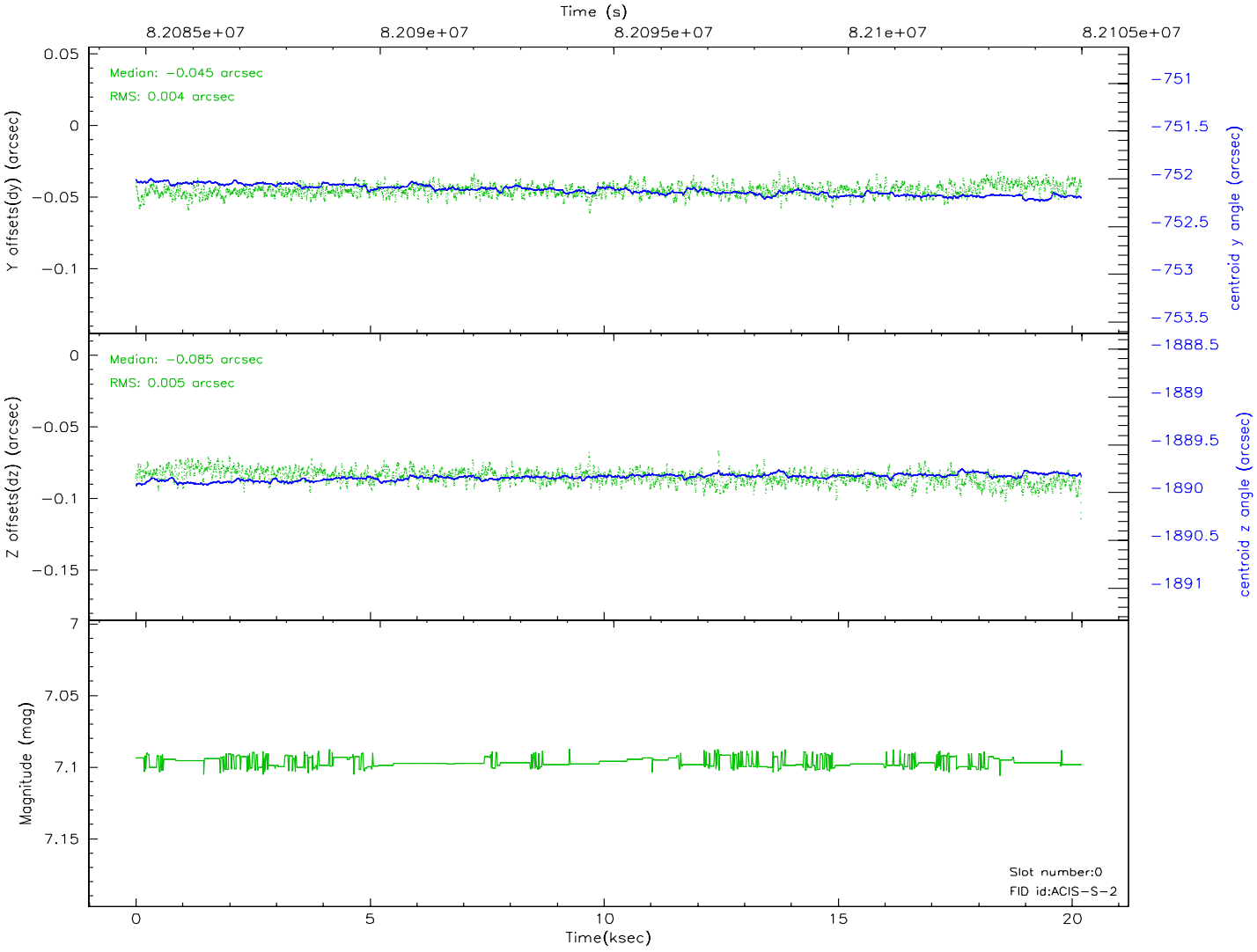

Time (s)
Median: −0.022 arcsec
RMS: 0.057 arcsec
Y offsets(dy) (arcsec)
Median: 0.021 arcsec
RMS: 0.056 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number:7
AGASC star id:981469488
Time(ksec)

2.5 FID Slots

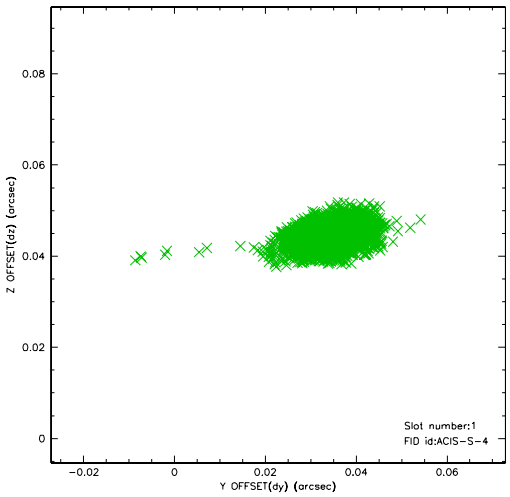
2.5.1 Slot 0

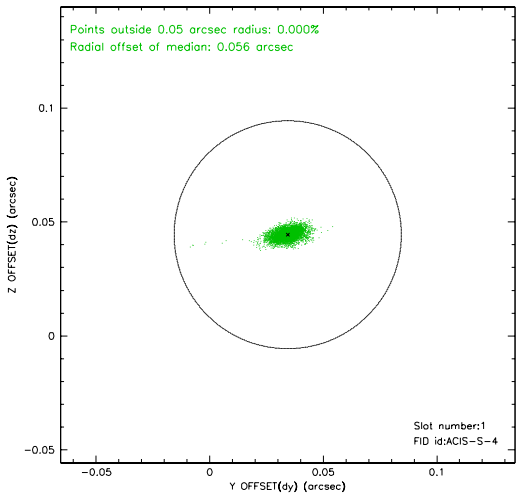


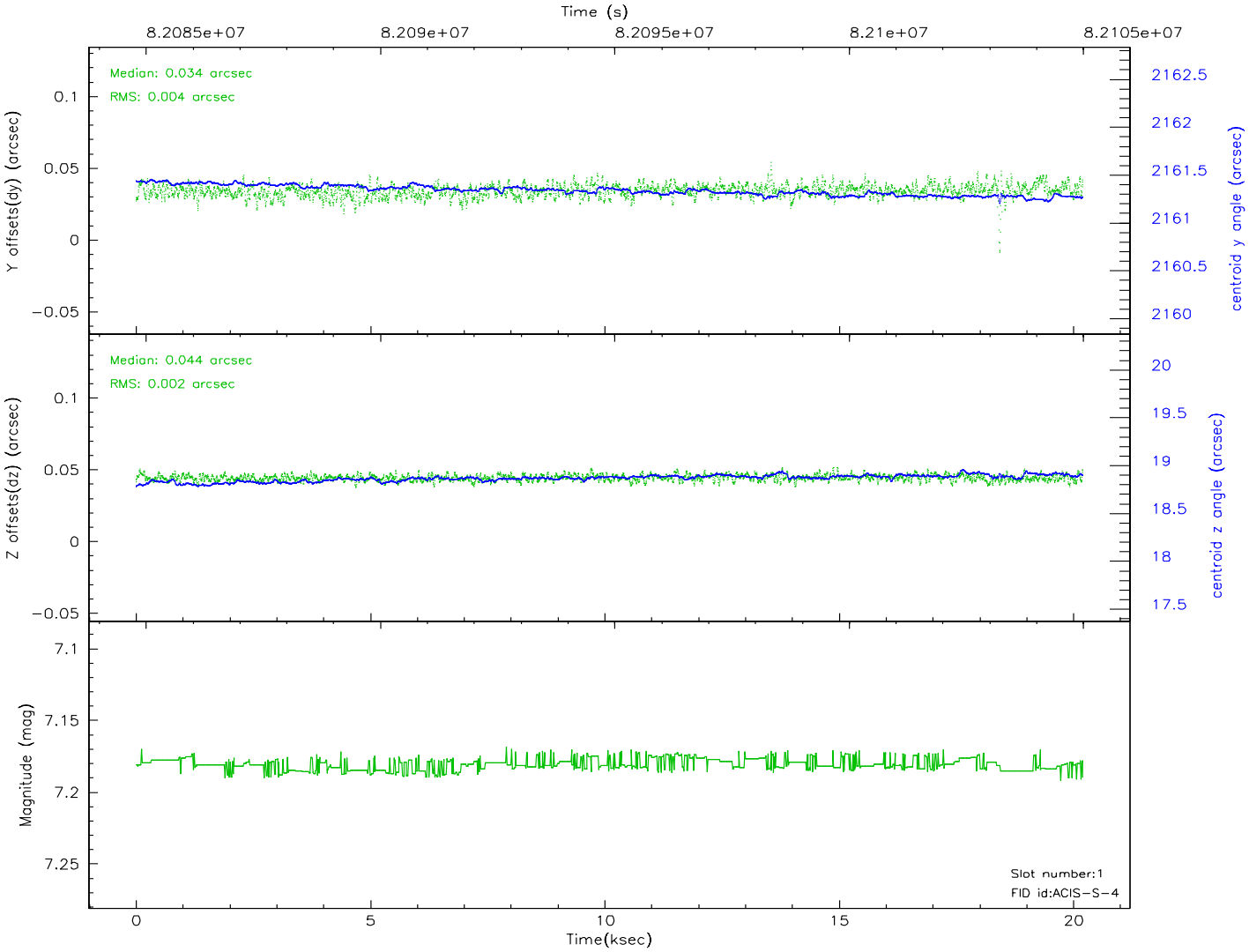




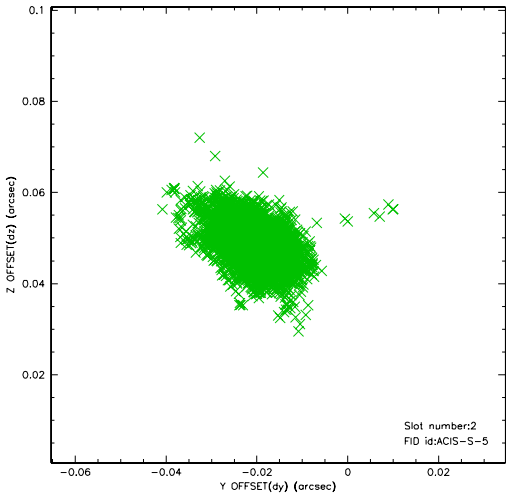
2.5.2 Slot 1

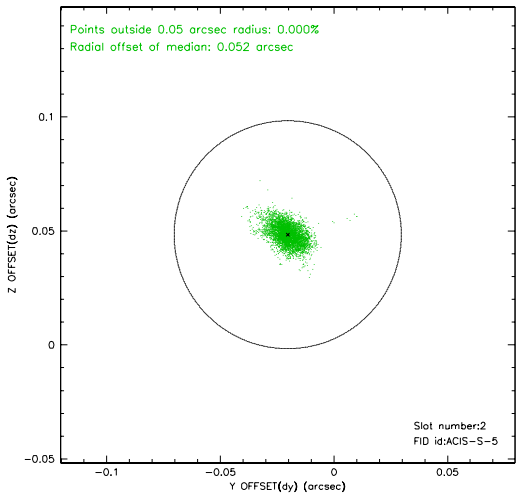

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4

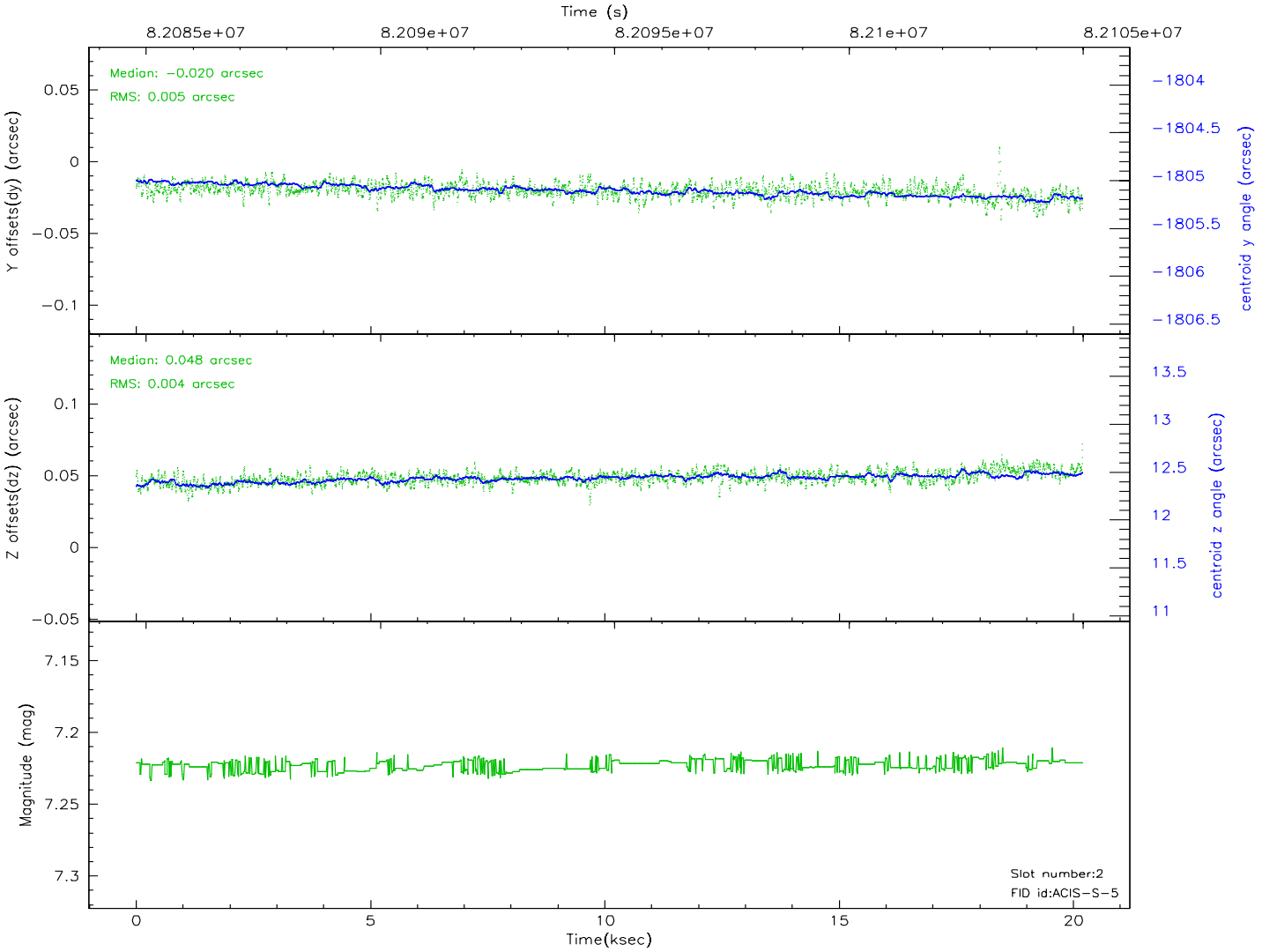

Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.056 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:1
FID id:ACIS-S-4


Time (s)
Median: 0.034 arcsec
RMS: 0.004 arcsec
Y offsets(dy) (arcsec)
Median: 0.044 arcsec
RMS: 0.002 arcsec
Z offsets(dz) (arcsec)
centroid y angle (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:1
FID id:ACIS-S-4
Time(ksec)

2.5.3 Slot 2

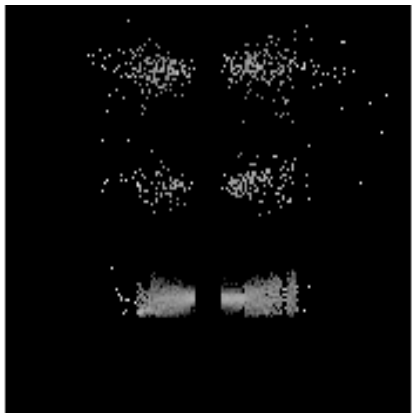

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.052 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number:2
FID id:ACIS-S-5

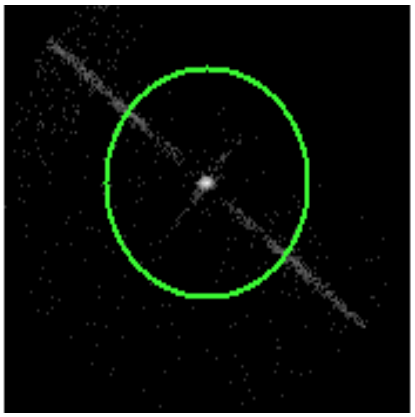

Time (s)
Median: −0.020 arcsec
RMS: 0.005 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.048 arcsec
RMS: 0.004 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number:2
FID id:ACIS-S-5
Time(ksec)

3 Gratings

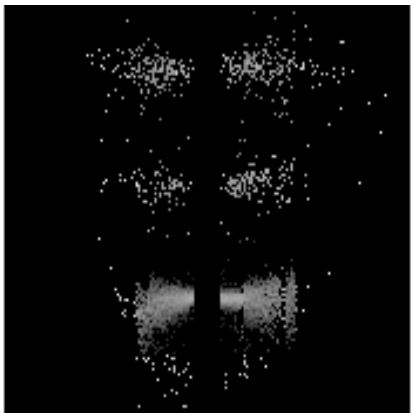
3.1 LETG Arm



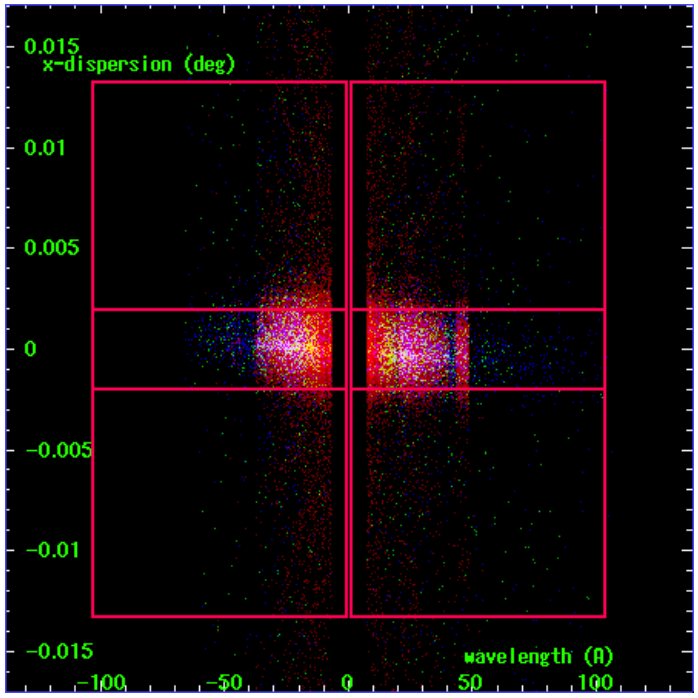
LETG Order Sort 123

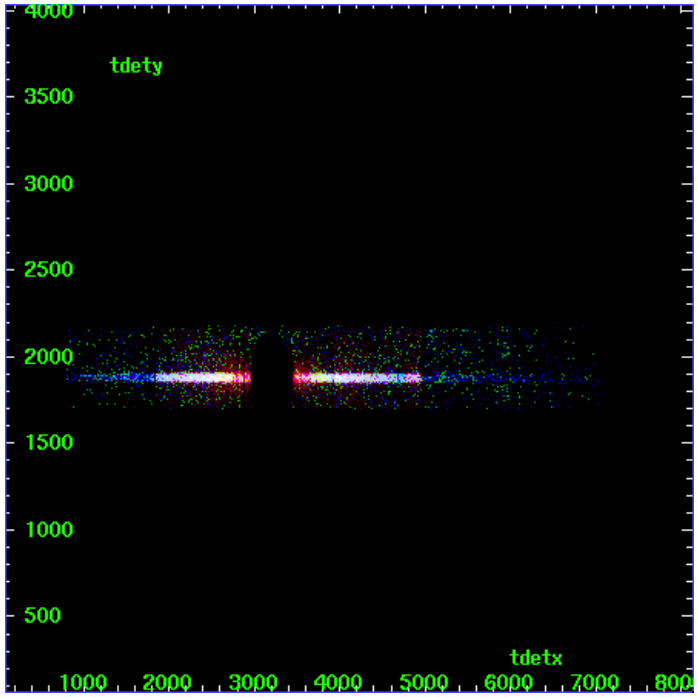


LETG Zero Order



LETG Order Sort ALL

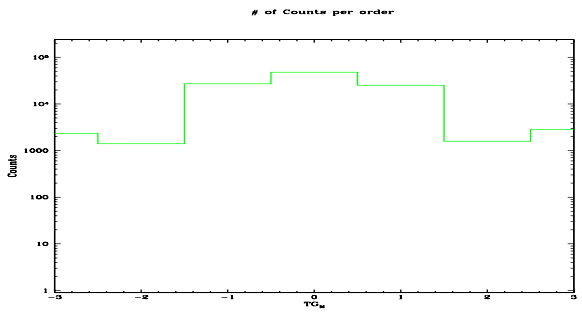


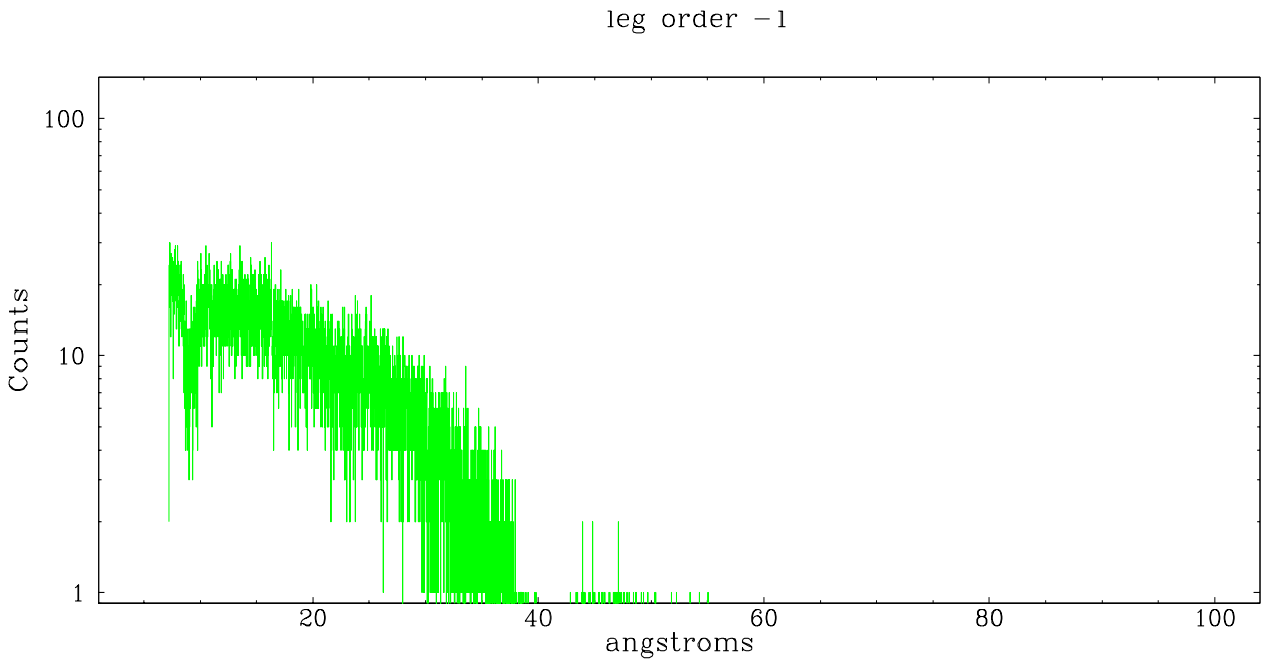


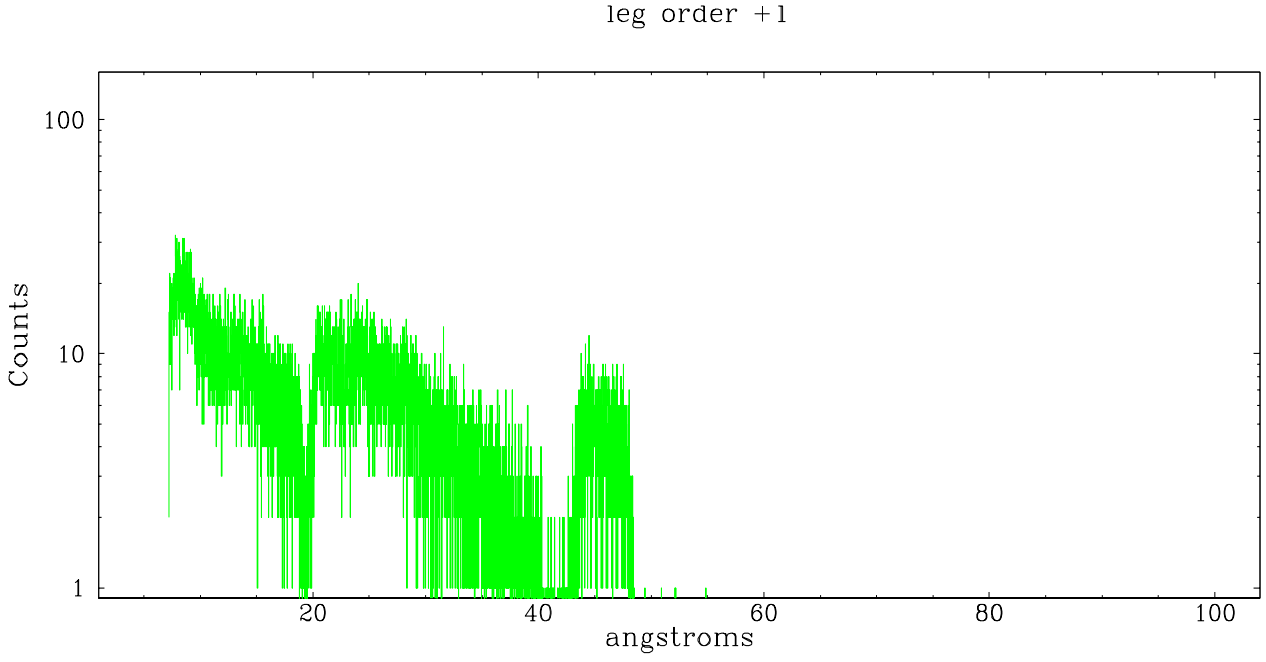
Spot Image LETG

Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	2341	1404	27161	47879	25203	1585	2829




leg order −1
100
10
1
Counts
20
40
60
80
100
angstroms


leg order +1
100
10
1
Counts
20
40
60
80
100
angstroms

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2007.08.02
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	19.756

A.2 Comments

```
Zeroth order off-axis and thus extended. Standard data processing
software did not correctly
locate the zeroth order. Manual intervention was used
to input the correct sky coordinates (x=3367.78; y=4695.49) 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 leg 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.
```