V&V Reference Report
L2 ASCDS Version : 8.4.5

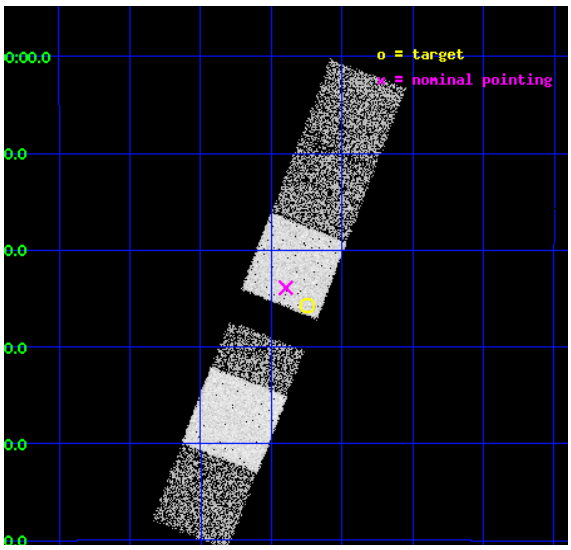
Observation 2414 - L2 Version 3
Chandra X-Ray Center

L2 Processing Date : Sep 6 2012

Contents

1 Front

seq_num	100026	Sequence number
obs_id	2414	Observation id
title	VENUS AND MARS: THE CLOSEST PLANETARY ANALOGUES TO COMETS	Proposal
observer	Dr. Konrad Dennerl	Principal investigator
object	VENUS	Source name
dtycycle	0	
cycle	P	events from which exps? Prim/Second/Both
ra_targ	339.68718	Observer's specified target RA [deg]
dec_targ	-9.42834	Observer's specified target Dec [deg]
ra_nom	339.72424185968	Nominal RA [deg]
dec_nom	-9.398475591084	Nominal Dec [deg]
roll_nom	291.38879964955	Nominal Roll [deg]
revision	3	Processing version of data
ontime	5753.5818227679	Sum of GTIs [s]
livetime	5680.7265053369	Livetime [s]
ontime4	5750.3590451032	Sum of GTIs [s]
ontime5	5753.5407827646	Sum of GTIs [s]
ontime6	5753.4997427762	Sum of GTIs [s]
ontime7	5753.5818227679	Sum of GTIs [s]
ontime8	5750.2177425176	Sum of GTIs [s]
ontime9	5750.1766726077	Sum of GTIs [s]
l2events	49136	Number of level 2 events

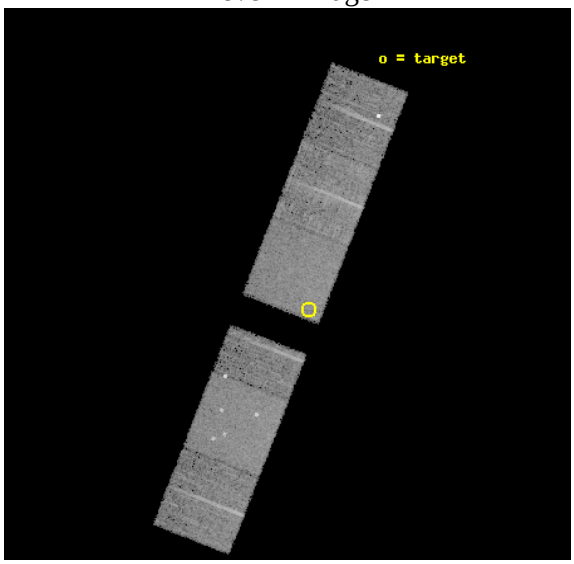


2 OBI

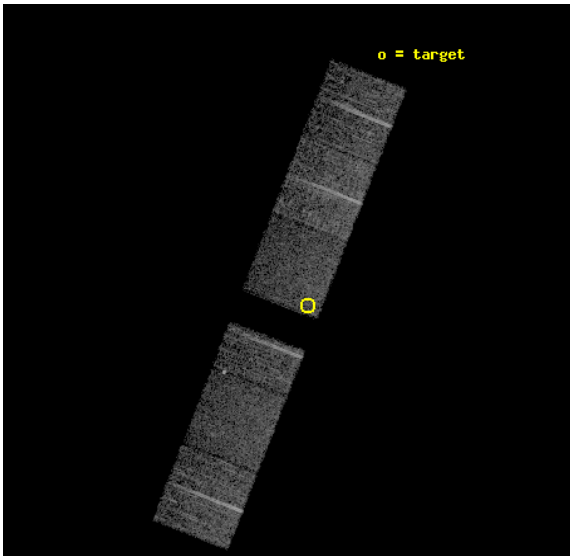
2.1 OBI

2.1.1 Images

Level 1 Image

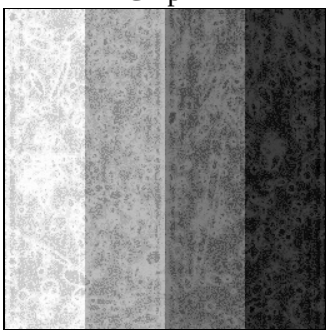


Level 1 Bad Events

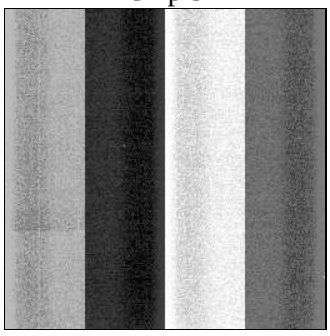


2.1.2 Bias

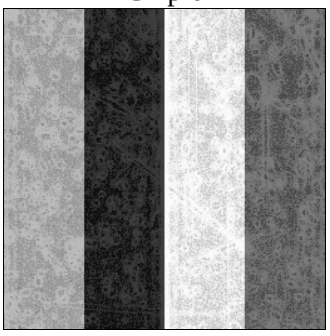
Chip 4



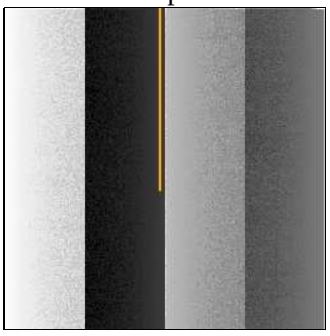
Chip 5



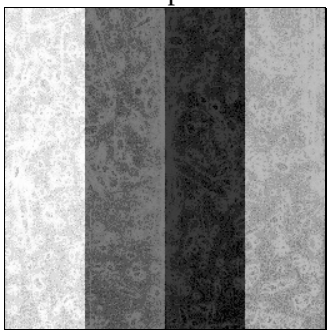
Chip 6



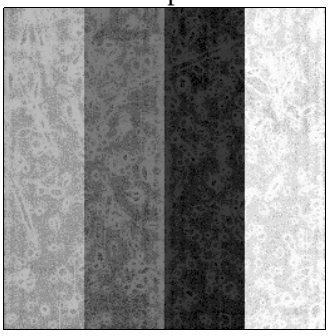
Chip 7



Chip 8



Chip 9



2.1.3 Parameters

obi_num	0	Obi number
ascdsver	8.4.5	Processing system revision
caldbver	4.5.1.1	
date	2012-09-06T11:17:11	Date and time of file creation
revision	3	Processing version of data

sched_exp_time	6000.000000	[s] Scheduled observation exposure time
ontime	5753.5818227679	Sum of GTIs [s]
ontime4	5750.3590451032	Sum of GTIs [s]
ontime5	5753.5407827646	Sum of GTIs [s]
ontime6	5753.4997427762	Sum of GTIs [s]
ontime7	5753.5818227679	Sum of GTIs [s]
ontime8	5750.2177425176	Sum of GTIs [s]
ontime9	5750.1766726077	Sum of GTIs [s]
l1events	232934	Number of level 1 events

2.1.4 Events

	ccd 4	**ccd 5**	**ccd 6**	**ccd 7**	**ccd 8**	**ccd 9**
level 1 events	37343	49964	20979	43161	44619	36868
rejected events	33339	26412	18754	25507	36849	29523
rejected %	89%	52%	89%	59%	82%	80%

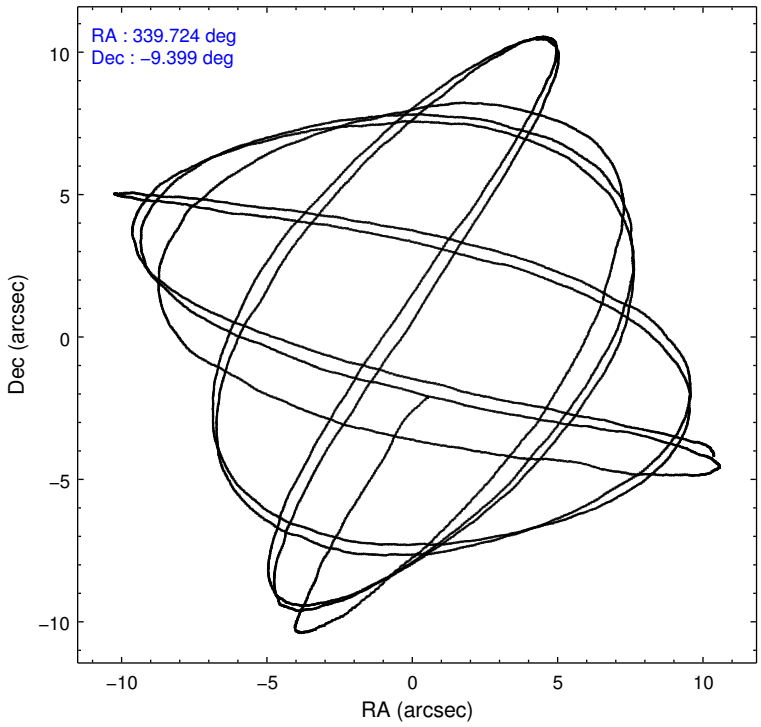
	ccd 4	**ccd 5**	**ccd 6**	**ccd 7**	**ccd 8**	**ccd 9**
grade 0 events	1589	3877	798	1575	2432	1531
	4%	7%	3%	3%	5%	4%
grade 1 events	18	227	12	42	27	14
	0%	0%	0%	0%	0%	0%
grade 2 events	955	6344	482	3432	1628	4049
	2%	12%	2%	7%	3%	10%
grade 3 events	402	967	248	1622	881	402
	1%	1%	1%	3%	1%	1%
grade 4 events	359	875	216	1556	776	399
	0%	1%	1%	3%	1%	1%
grade 5 events	1206	3898	872	4207	1739	1511
	3%	7%	4%	9%	3%	4%
grade 6 events	702	11514	482	9492	2059	971
	1%	23%	2%	21%	4%	2%
grade 7 events	32112	22262	17869	21235	35077	27991
	85%	44%	85%	49%	78%	75%

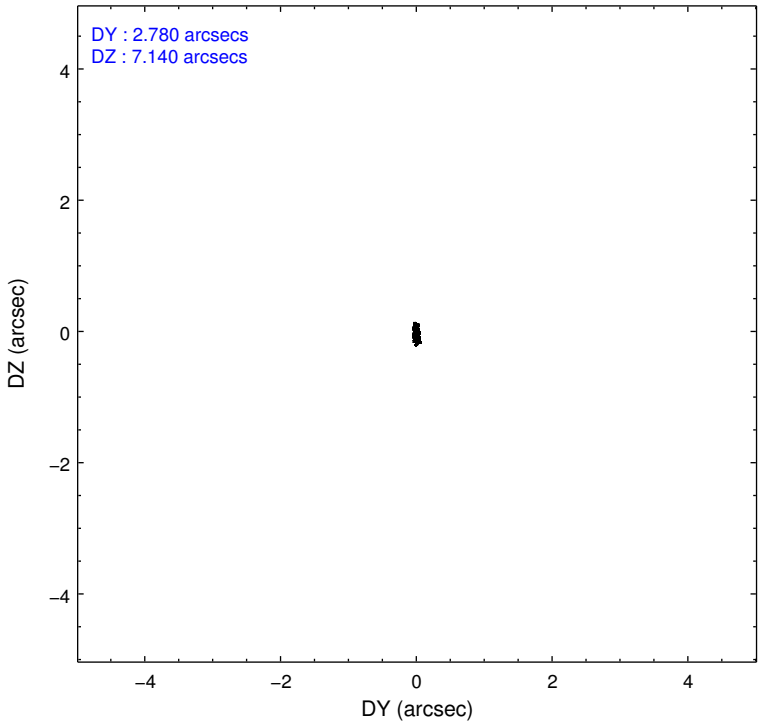
2.2 Compared Parameters

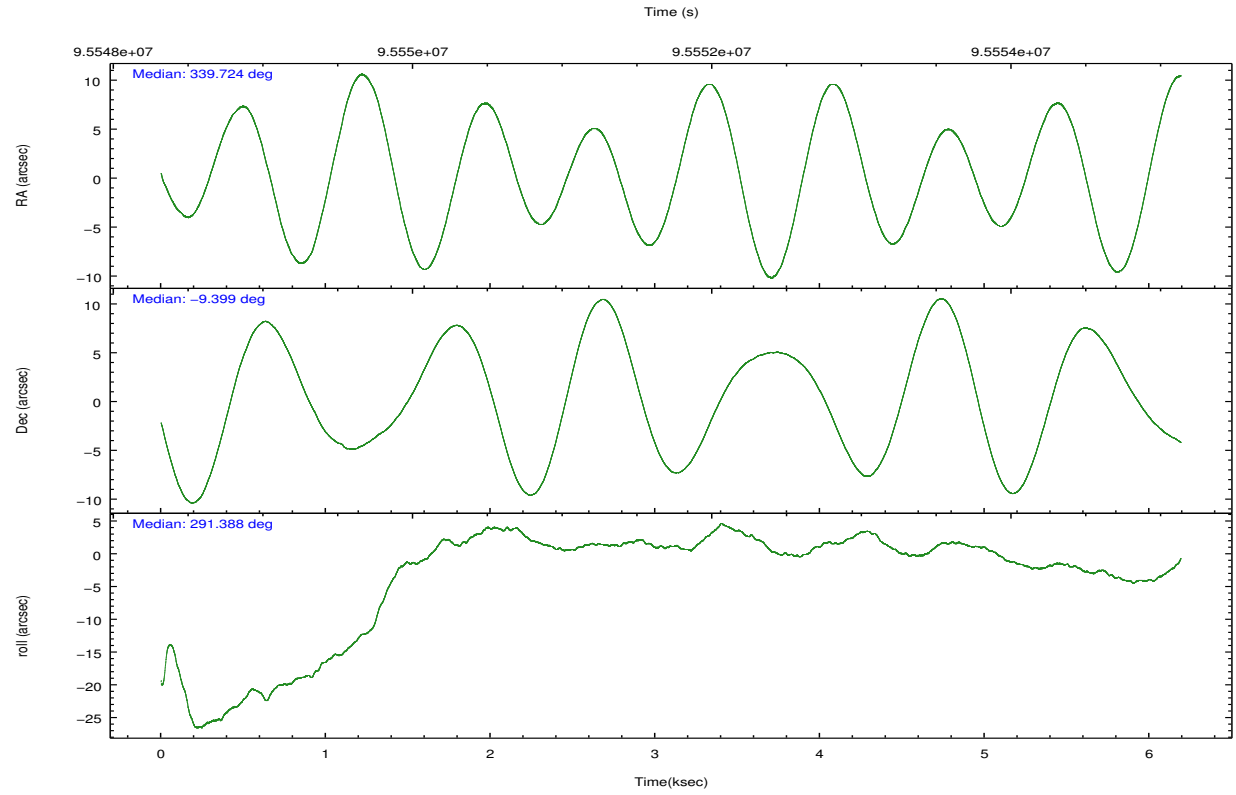
Parameter	Planned	Actual
Instrument	ACIS	ACIS
Detector	ACIS-456789	ACIS-456789
Grating	LETG	LETG
Data mode	VFAINT	VFAINT
Observation mode	POINTING	POINTING
[deg] Pointing RA	339.702468	339.724241859679
[deg] Pointing Dec	-9.381548	-9.398475591084027
[deg] Pointing Roll	291.228623	291.3887996495477
[s] Window start time (MET)	95299264.184000	95299264.184000
[s] Window stop time (MET)	95990464.184000	95990464.184000
[mm] SIM focus pos	-0.684267	-0.6828225247311905
[mm] SIM defocus	0	0.001444936568705701
[mm] SIM translation stage pos	-190.132523	-190.1400660498719
[mm] SIM translation stage offset	0	0.00754346686406393
[s] Observation start time (MET)	95548828.184000	95548452.284015
Observation start date	2001-01-10T21:19:24	2001-01-10T21:14:12
[s] Observation end time (MET)	95554828.184000	95555689.296792
Observation end date	2001-01-10T22:59:24	2001-01-10T23:14:49
Read mode	TIMED	TIMED

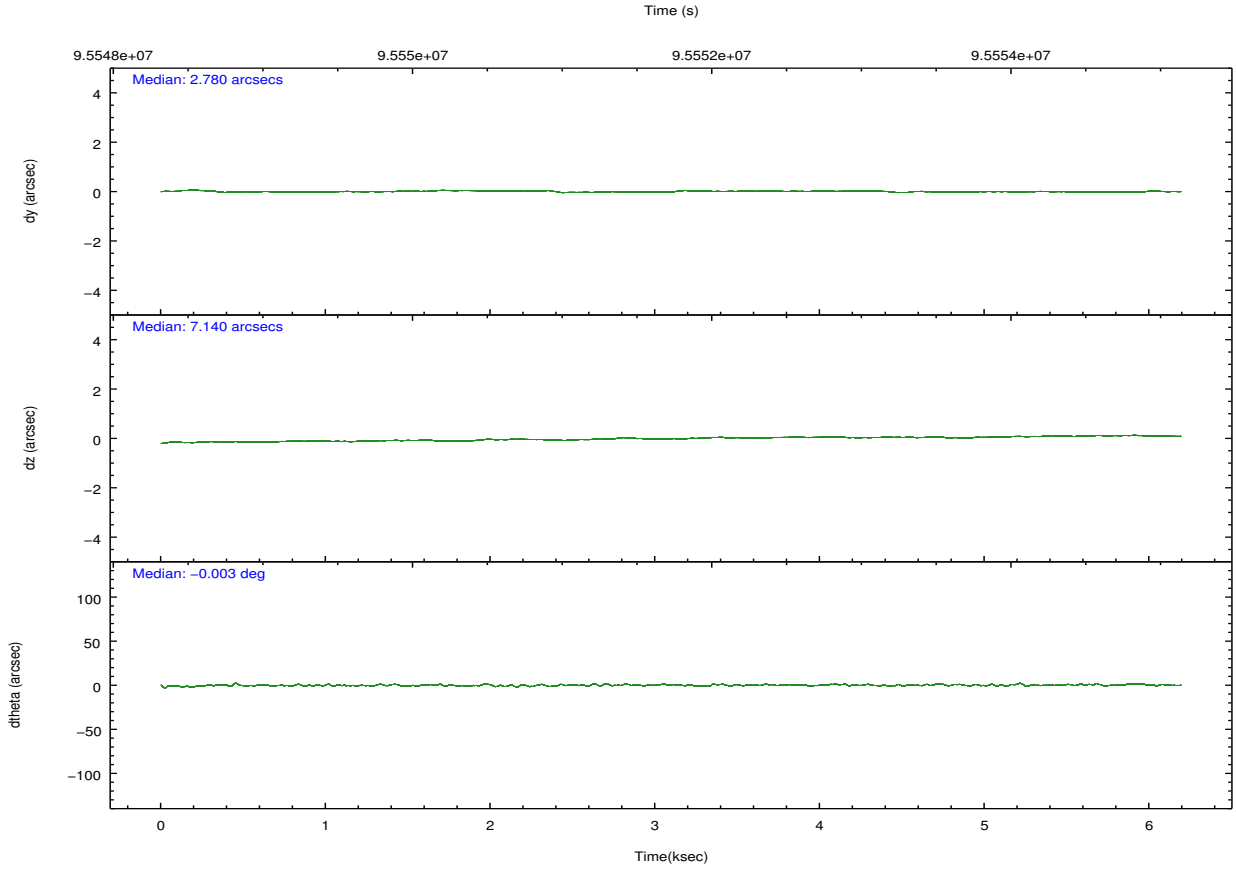
Parameter	Planned	Actual
Obspar format version number	7	7
Obspar file type	PREDICTED	ACTUAL
Obspar update status	NONE	UPDATED
Number of optional ACIS chips dropped	0	0
On-chip summing requested	N	N
Subarray requested	NONE	NONE
Alternating exposures requested	N	N
[s] Primary exposure time	0.000000	3.2

2.3 Aspect


RA : 339.724 deg
Dec : −9.399 deg
Dec (arcsec)
RA (arcsec)
10
5
0
−5
−10
−10
−5
0
5
10


DY : 2.780 arcsecs
DZ : 7.140 arcsecs
DZ (arcsec)
DY (arcsec)
4
2
0
−2
−4
−4
−2
0
2
4


Time (s)
9.5548e+07
9.555e+07
9.5552e+07
9.5554e+07
Median: 339.724 deg
RA (arcsec)
Median: −9.399 deg
Dec (arcsec)
Median: 291.388 deg
roll (arcsec)
Time(ksec)

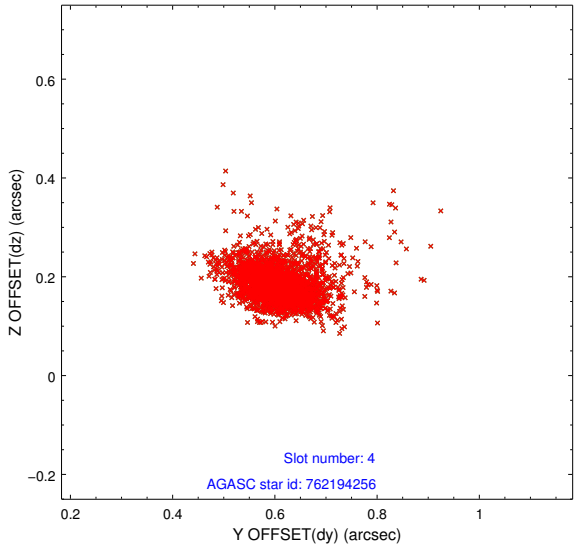

Time (s)
9.5548e+07
9.555e+07
9.5552e+07
9.5554e+07
Median: 2.780 arcsecs
dy (arcsec)
Median: 7.140 arcsecs
dz (arcsec)
Median: −0.003 deg
dtheta (arcsec)
Time(ksec)

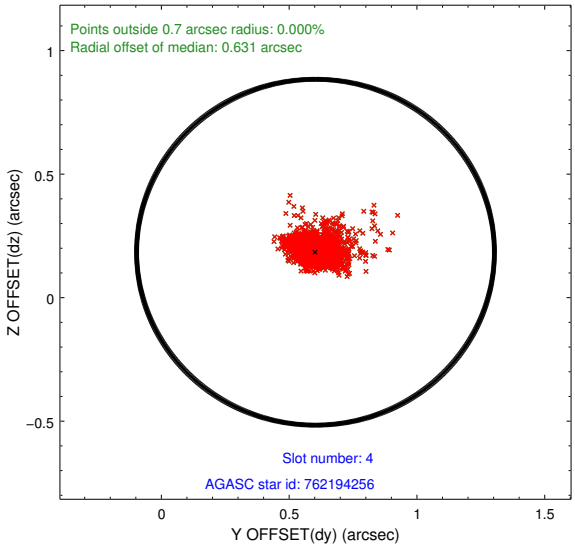
Slot Statistics

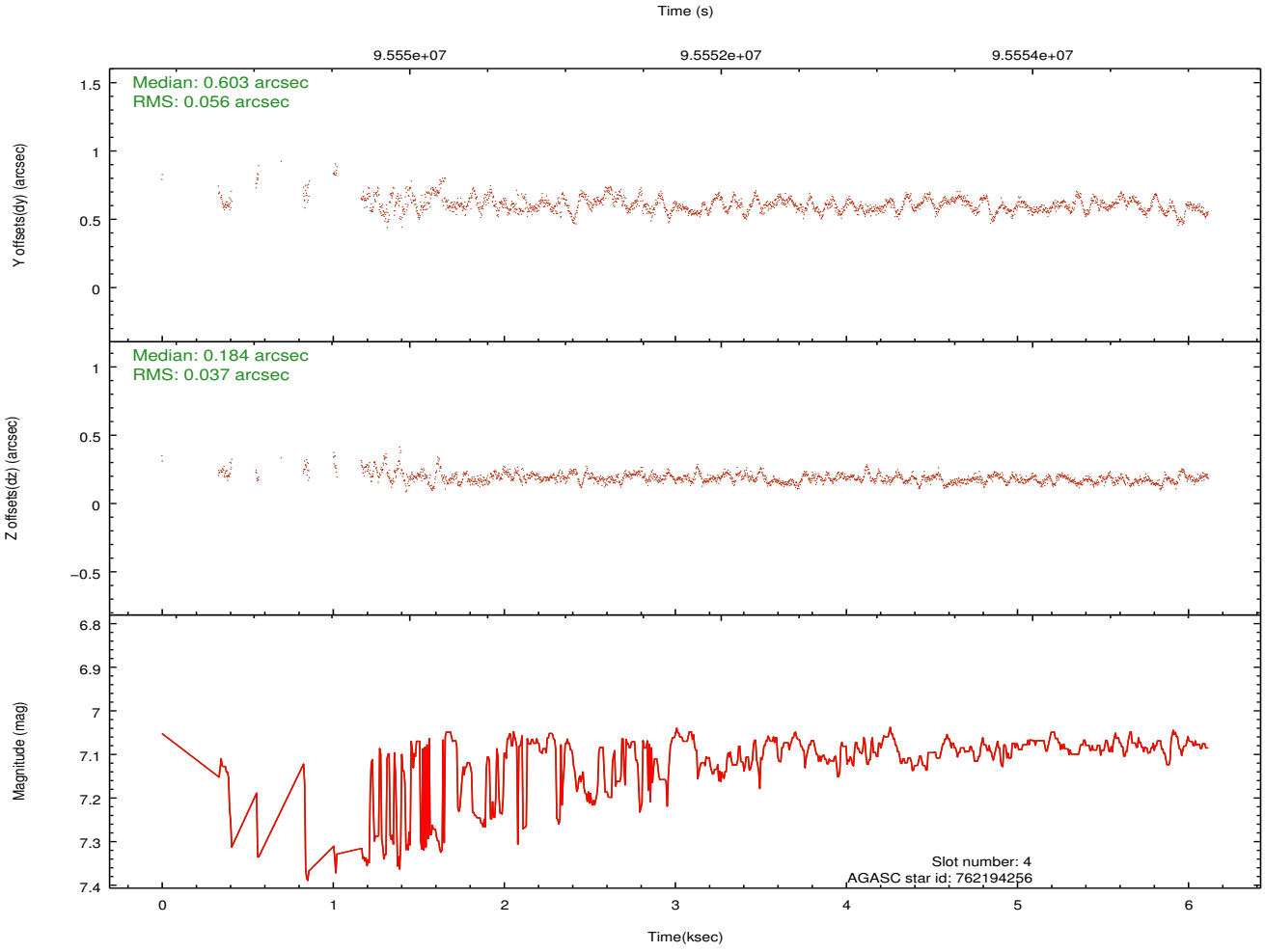
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-S-2	7.12	1511	-0.010	0.001	0.007	0.015	0.000000	0.000000	-755.46	-1728.28
1	OMITTED		0.00	0	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0.00
2	FID	ACIS-S-5	7.23	1510	-0.009	0.003	0.007	0.015	0.000000	0.000000	-1808.97	172.73
3	OMITTED		0.00	0	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0.00
4	BAD	762194256	7.09	2493	0.603	0.184	0.063	0.126	339.816781	-10.027795	2315.20	-465.17
5	GUIDE	761672120	8.11	3021	-0.309	-0.153	0.074	0.309	339.232283	-9.389338	-577.49	-1567.67
6	GUIDE	761670320	9.20	3020	-0.265	-0.009	0.099	0.304	339.180611	-8.948429	-2125.06	-1166.55
7	OMITTED		0.00	0	0.000	0.000	0.000	0.000	0.000000	0.000000	0.00	0.00

2.4 Star Slots

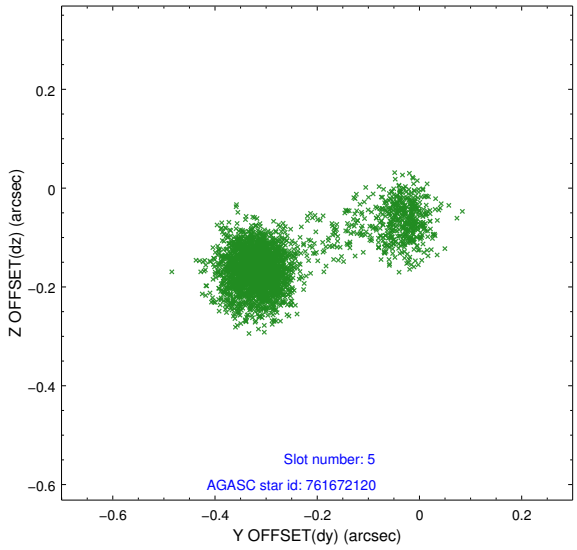
2.4.1 Slot 4

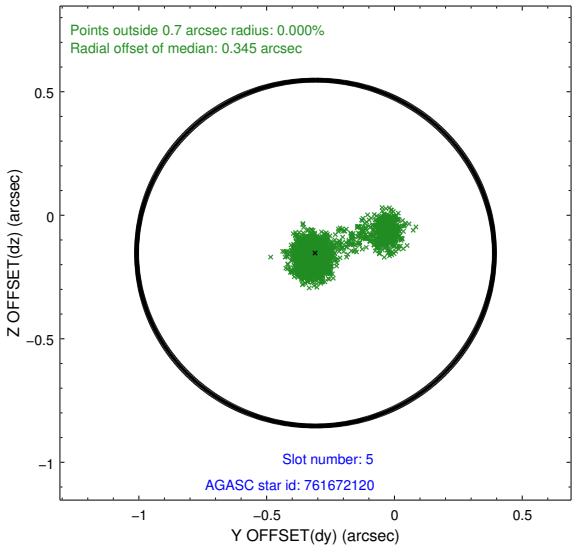


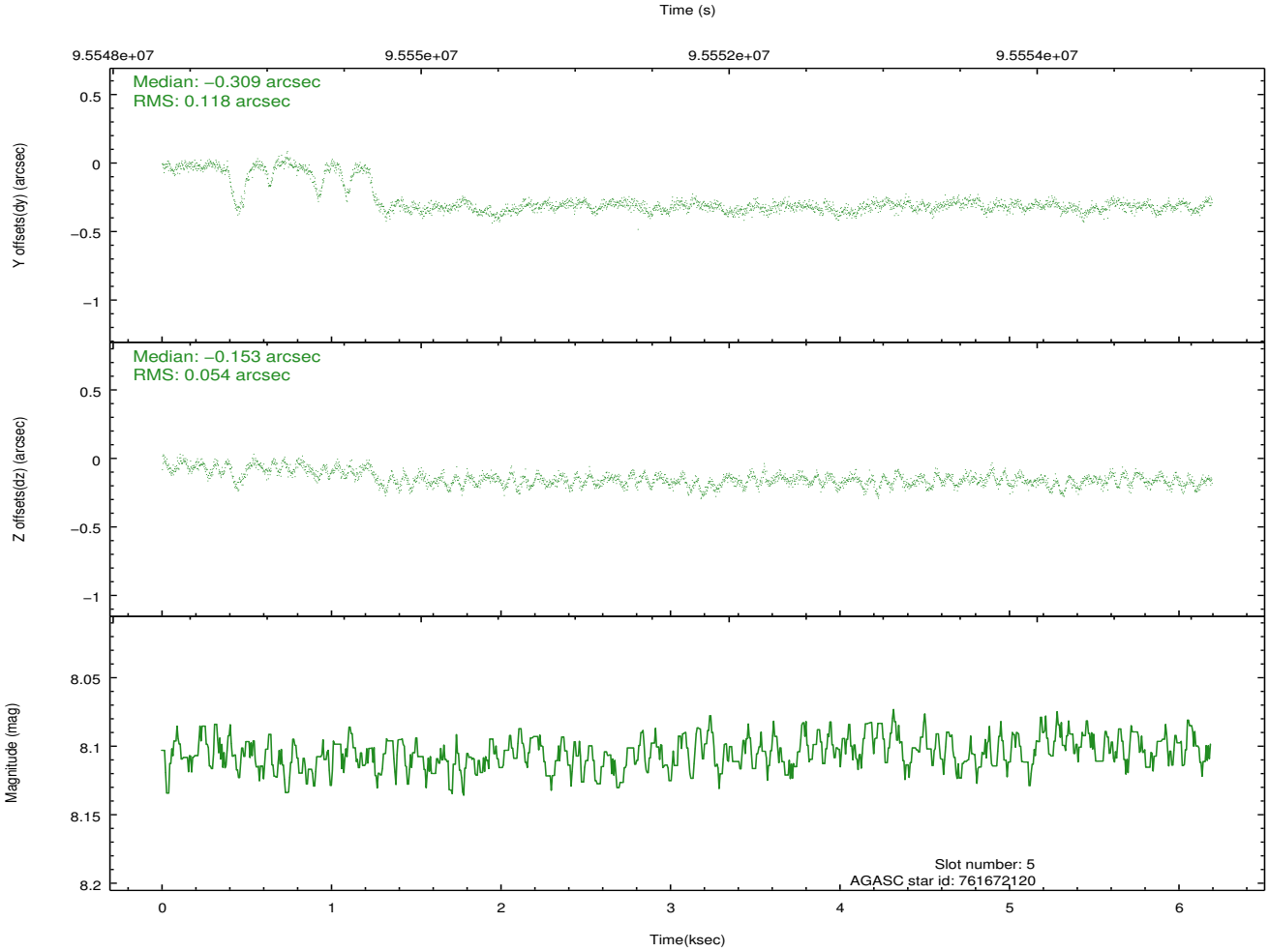




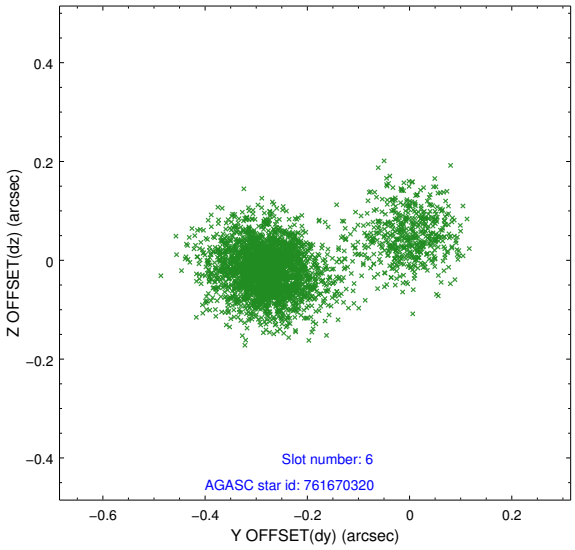
2.4.2 Slot 5

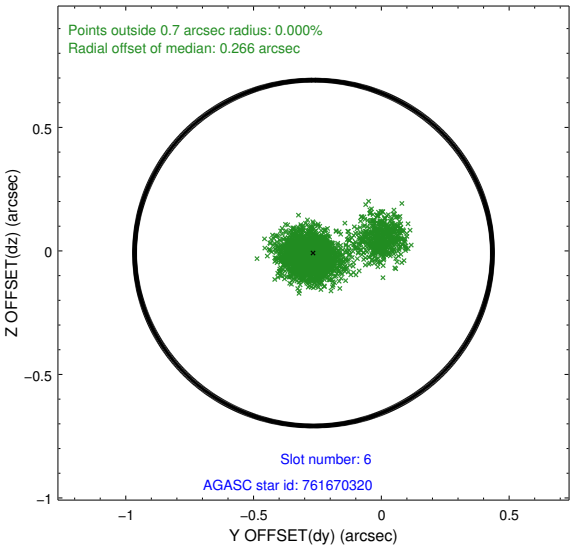

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 761672120

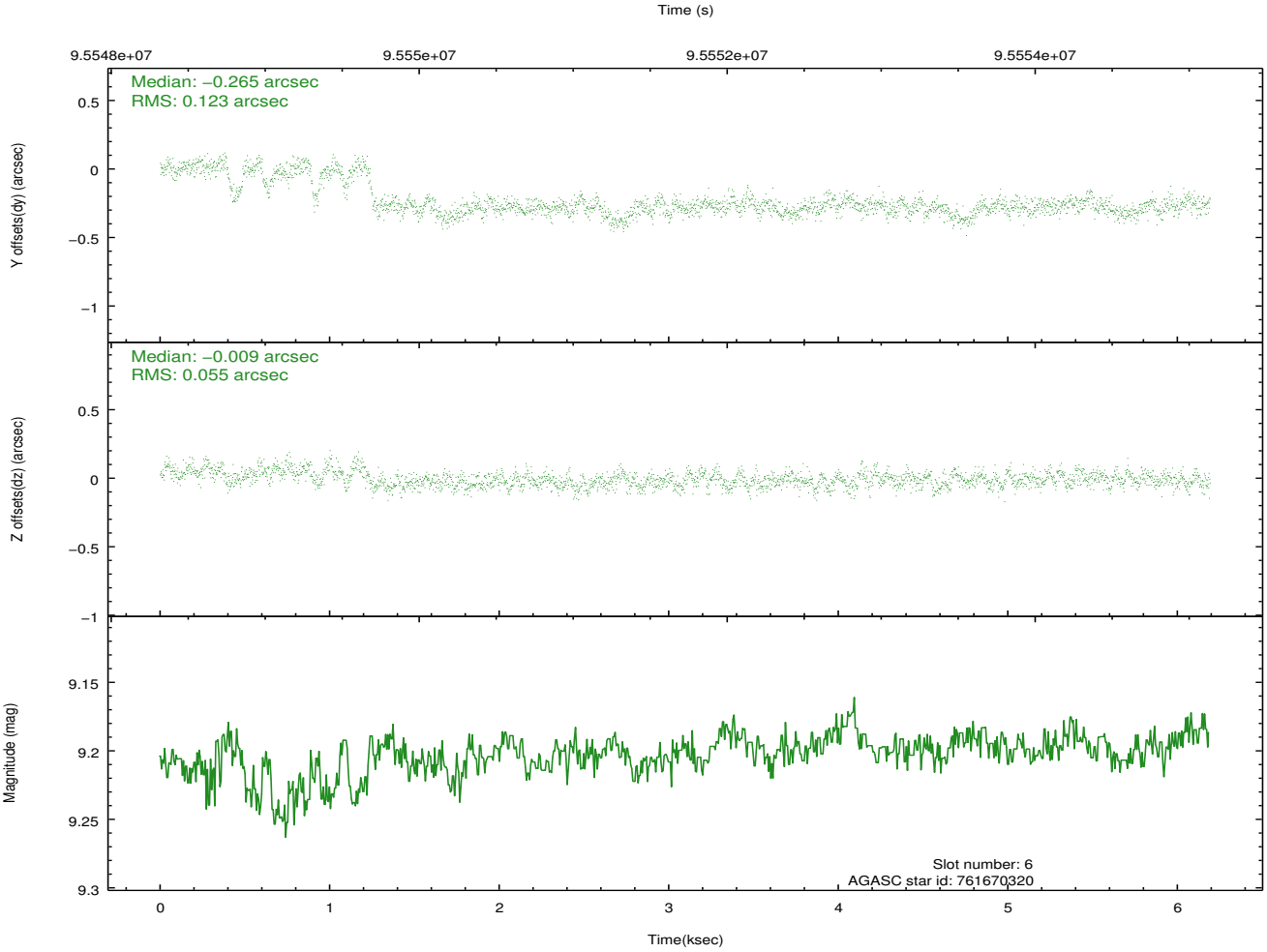

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.345 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 5
AGASC star id: 761672120


Time (s)
Median: −0.309 arcsec
RMS: 0.118 arcsec
Y offsets(dy) (arcsec)
Median: −0.153 arcsec
RMS: 0.054 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 5
AGASC star id: 761672120
Time(ksec)

2.4.3 Slot 6

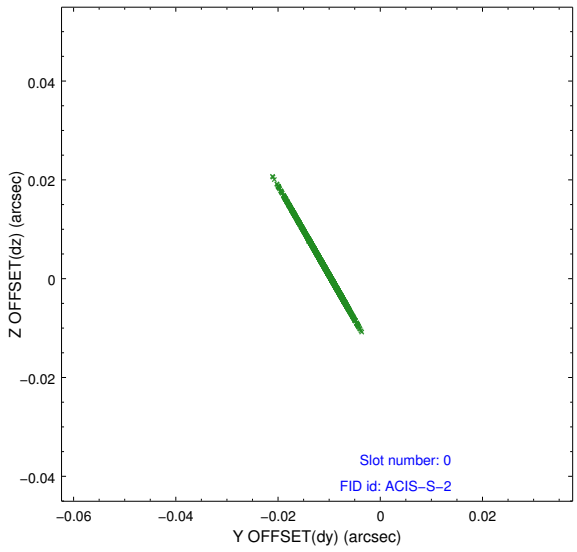

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 761670320

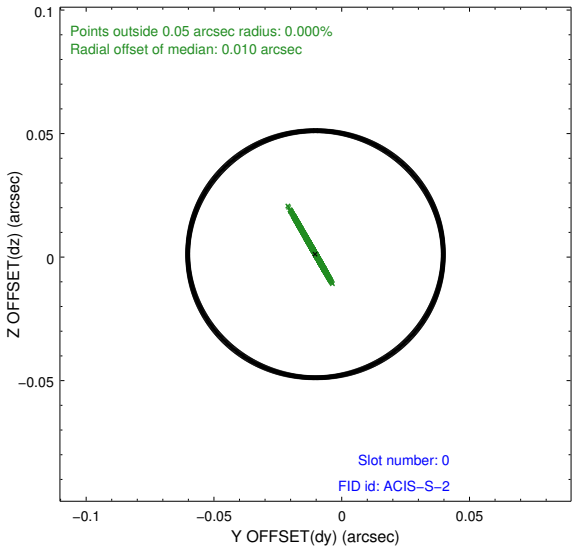

Points outside 0.7 arcsec radius: 0.000%
Radial offset of median: 0.266 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 6
AGASC star id: 761670320

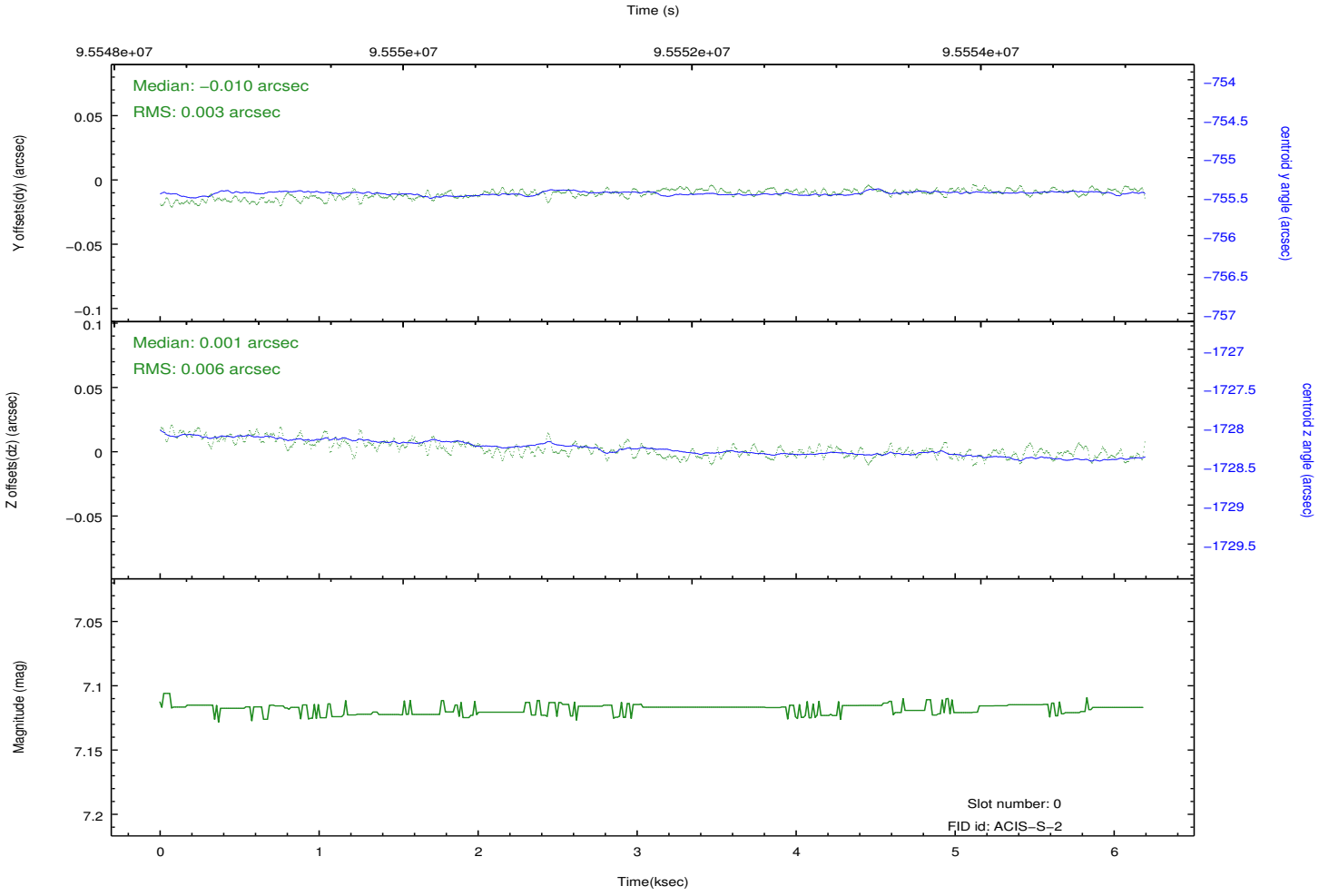

Time (s)
Median: −0.265 arcsec
RMS: 0.123 arcsec
Y offsets(dy) (arcsec)
Median: −0.009 arcsec
RMS: 0.055 arcsec
Z offsets(dz) (arcsec)
Magnitude (mag)
Slot number: 6
AGASC star id: 761670320
Time(ksec)

2.5 FID Slots

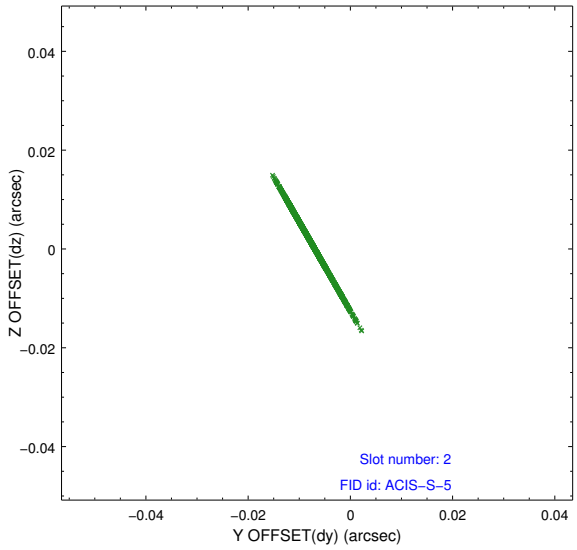
2.5.1 Slot 0

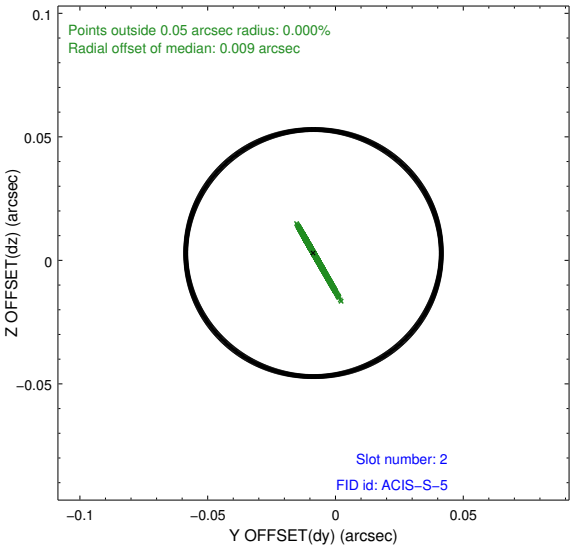


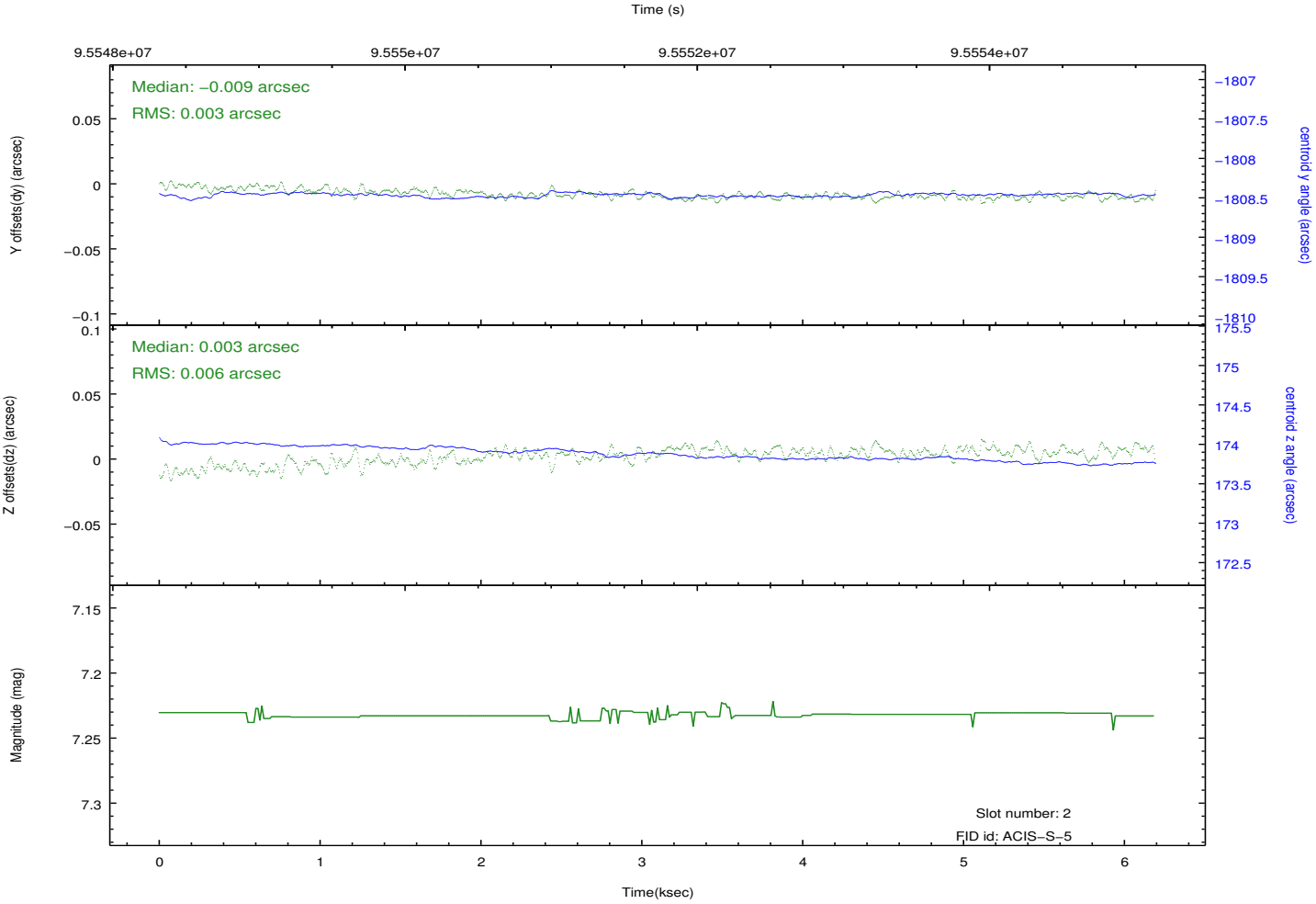




2.5.2 Slot 2

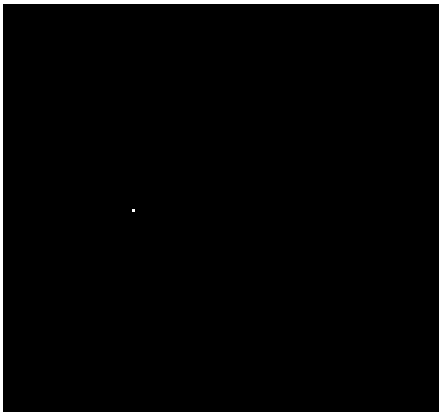

Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5


Points outside 0.05 arcsec radius: 0.000%
Radial offset of median: 0.009 arcsec
Z OFFSET(dz) (arcsec)
Y OFFSET(dy) (arcsec)
Slot number: 2
FID id: ACIS−S−5

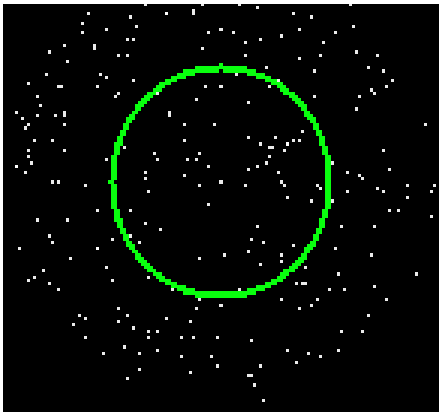

Time (s)
Median: −0.009 arcsec
RMS: 0.003 arcsec
Y offsets(dy) (arcsec)
centroid y angle (arcsec)
Median: 0.003 arcsec
RMS: 0.006 arcsec
Z offsets(dz) (arcsec)
centroid z angle (arcsec)
Magnitude (mag)
Slot number: 2
FID id: ACIS−S−5
Time(ksec)

3 Gratings

3.1 LETG Arm

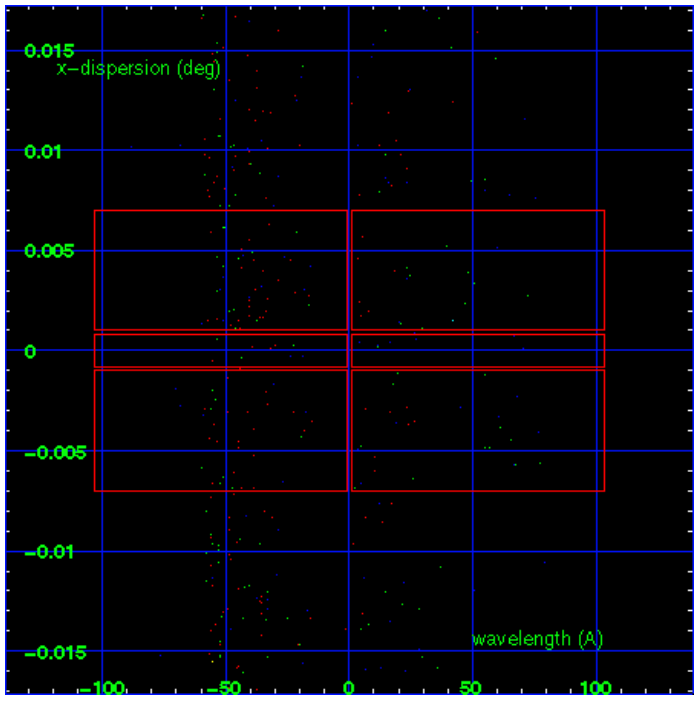


LETG Order Sort 123

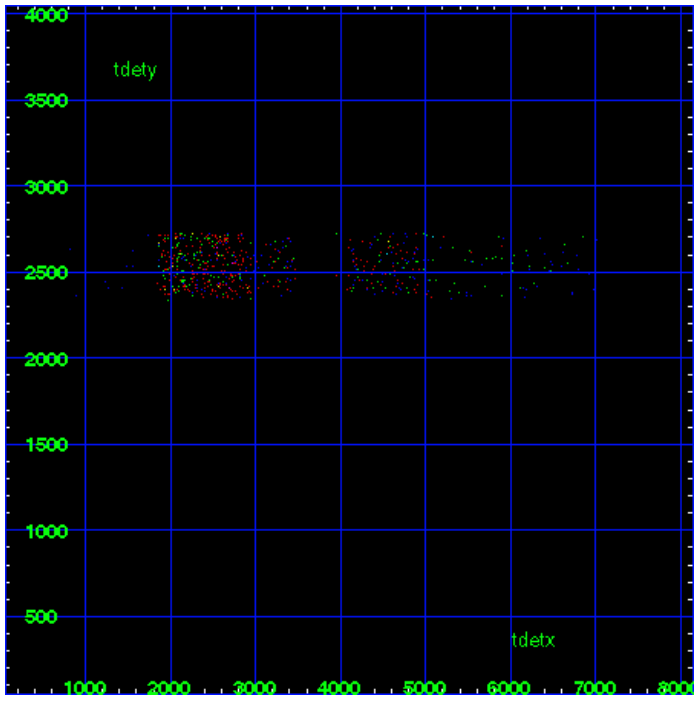


LETG Zero Order

LETG Order Sort ALL

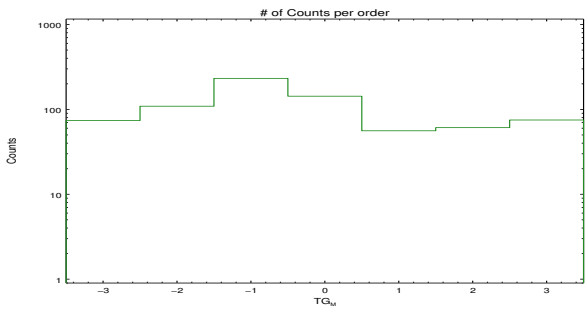


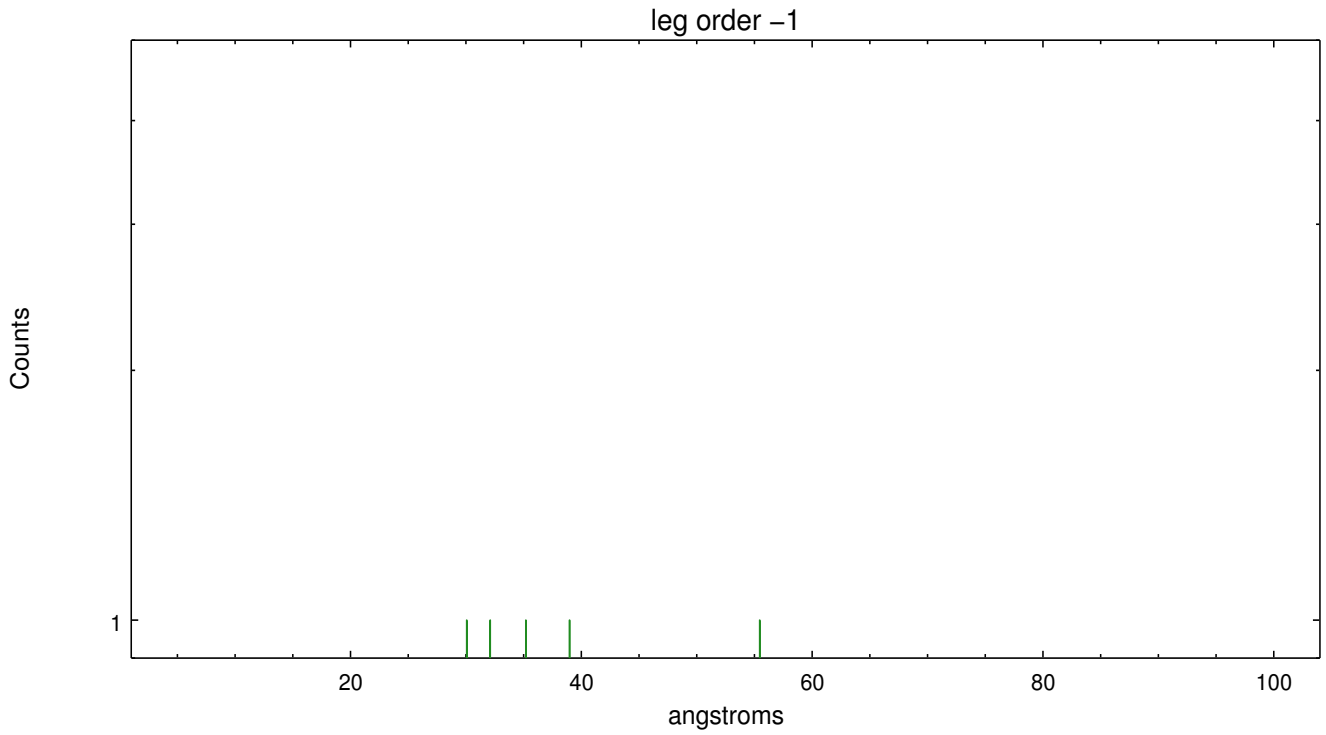
Spot Image LETG

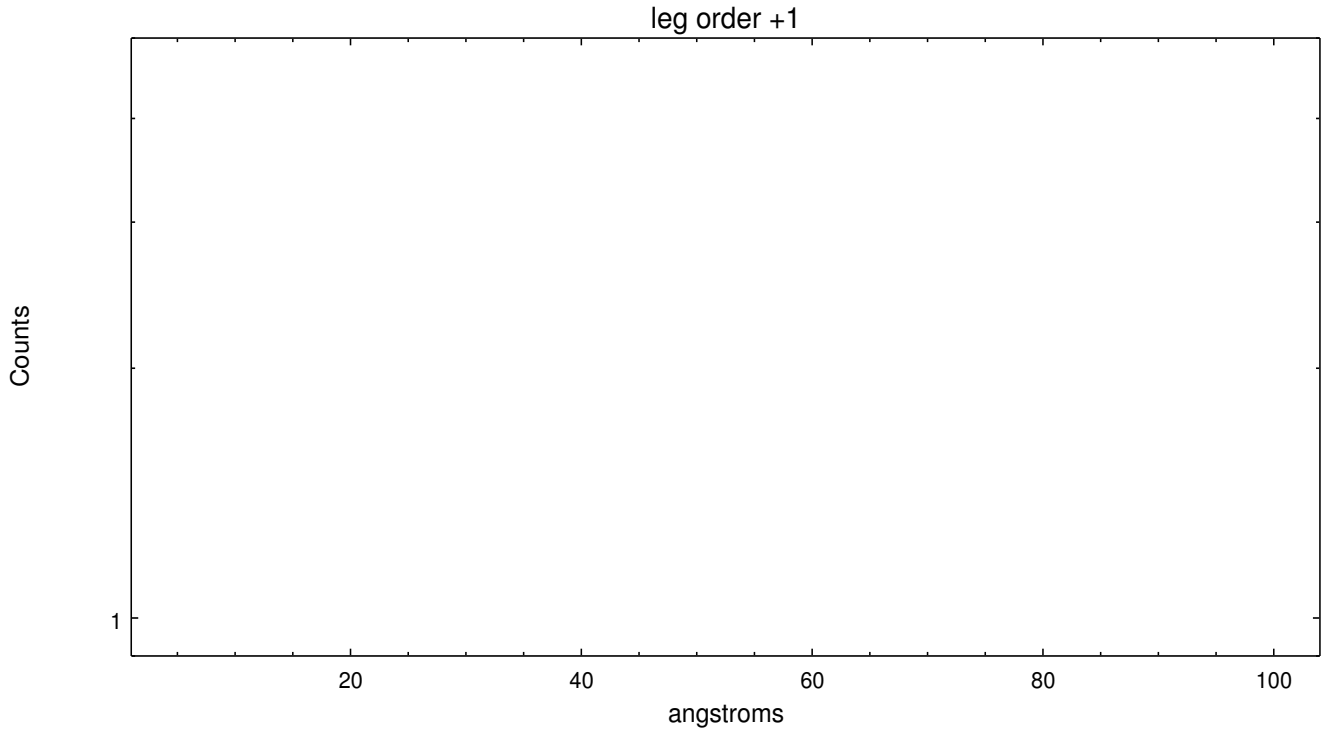


Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	74	109	232	143	56	61	75




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


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

A Summary

A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.09.13
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	5.756

A.2 Comments

```
This is a solar system object. X-ray events will be in the reference
frame
of the Earth. The user will need to run sso_freeze or similar software
to
redistribute the events spatially the reference frame of Venus.
===
A spatial exclusion window was specified for this observation on chip
S2.
===
The observations of Venus caused the aspect camera
to not track some guide stars and fid lights. This is
thought to be because of excessive light from Venus
on the aspect camera focal plane, even though the star
catalogs had been constructed to minimize such problems.One of 3
fiducial lights and 2 of 5 guide stars were excluded from the pointing
solution due to poor data quality and insufficient tracking accuracy.
The 2 remaining fid lights should be adequate for bore sight alignment,
but the aspect solution is probably affected to some degree by the use
of only 3 guide stars. The 3 guide stars that were used have a
discontinuity in y-position after about 1 ksec of the observation. This
is probably related to the fact that the spacecraft roll is off by 20
degrees during the first portion of the observation, then is corrected
and steady for the rest of the observation. The investigator is advised
to work with Level 1 data and evaluate whether events with bad grades
should be eliminated. It appears that some source events were removed in
the Level 2 version of the event data.
```