

# V&V Reference Report

## L2 ASCDS Version : 8.4.5

Observation 11964 - L2 Version 3  
Chandra X-Ray Center

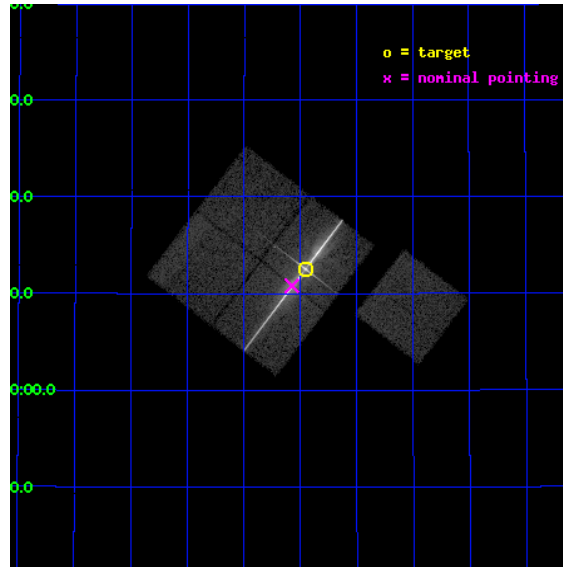
L2 Processing Date : Jul 20 2012

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# 1 Front

seq_num	790213	Sequence number
obs_id	11964	Observation id
title	AO-11 Calibration Observations of MKN 421	Proposal title
observer	Dr. CXC Calibration	Principal investigator
object	MKN421	Source name
dtcycle	0	&#160
cycle	P	events from which exps? Prim/Second/Both
ra_targ	166.113333	Observer's specified target RA [deg]
dec_targ	38.208806	Observer's specified target Dec [deg]
ra_nom	166.14382741422	Nominal RA [deg]
dec_nom	38.180182454966	Nominal Dec [deg]
roll_nom	127.45285799885	Nominal Roll [deg]
revision	3	Processing version of data
ontime	19770.486057222	Sum of GTIs [s]
livetime	19512.170102064	Livetime [s]
ontime0	19770.403977215	Sum of GTIs [s]
ontime1	19770.445027053	Sum of GTIs [s]
ontime2	19770.486057222	Sum of GTIs [s]
ontime3	19770.52710706	Sum of GTIs [s]
ontime6	19770.362947047	Sum of GTIs [s]
l2events	376724	Number of level 2 events

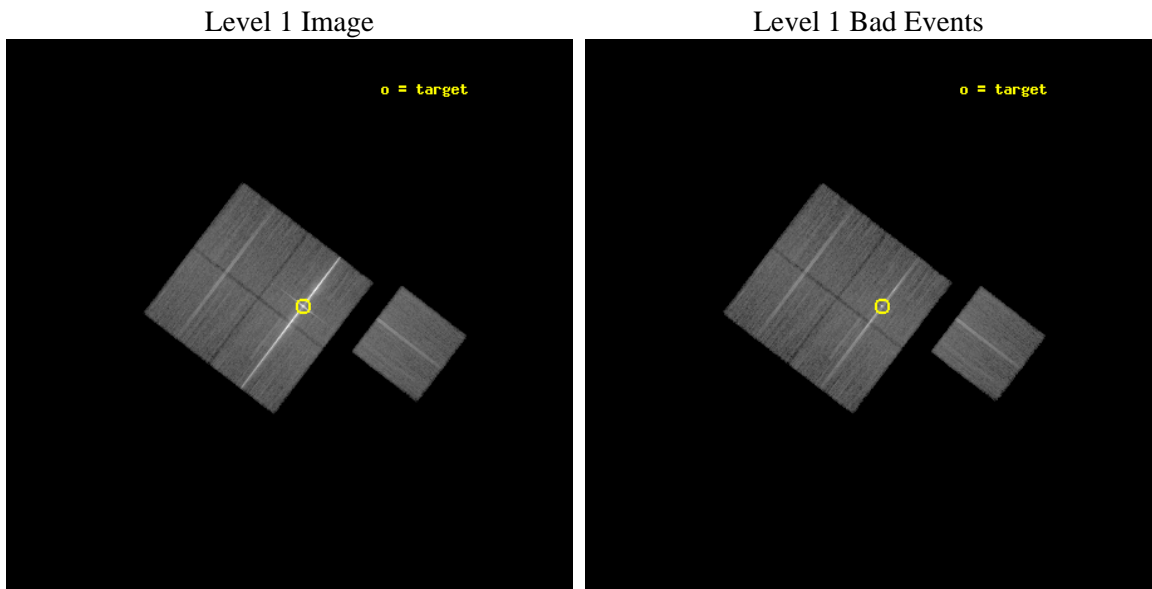




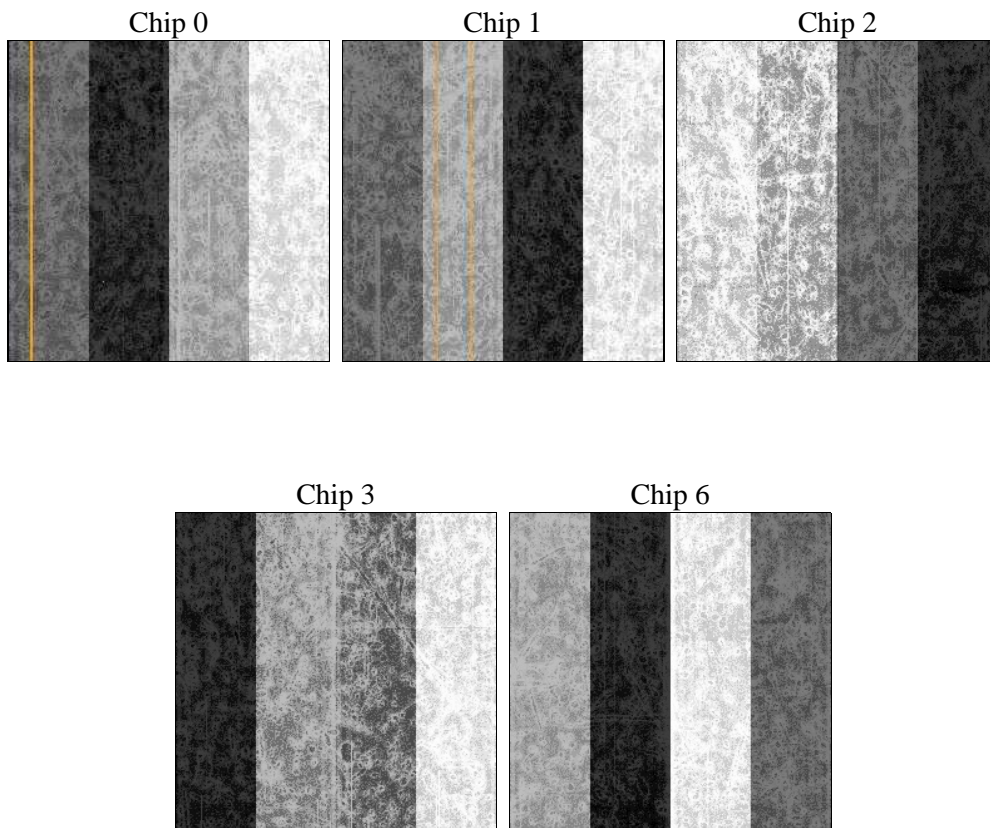
## 2 OBI

### 2.1 OBI

#### 2.1.1 Images



#### 2.1.2 Bias



### 2.1.3 Parameters

obi_num	0	Obi number	sched_exp_time	20000.000000	[s] Scheduled observation exposure time
ascdsver	8.4.5	Processing system revision	ontime	19770.486057222	Sum of GTIs [s]
caldsver	4.4.10	&#160	ontime0	19770.403977215	Sum of GTIs [s]
date	2012-06-21T00:57:10	Date and time of file creation	ontime1	19770.445027053	Sum of GTIs [s]
revision	2	Processing version of data	ontime2	19770.486057222	Sum of GTIs [s]
			ontime3	19770.52710706	Sum of GTIs [s]
			ontime6	19770.362947047	Sum of GTIs [s]
			l1events	1169132	Number of level 1 events

### 2.1.4 Events

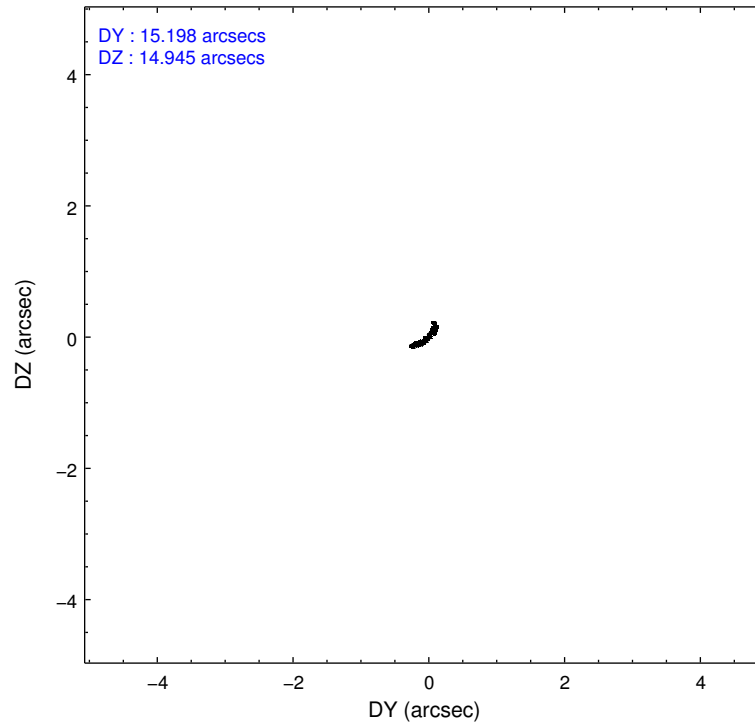
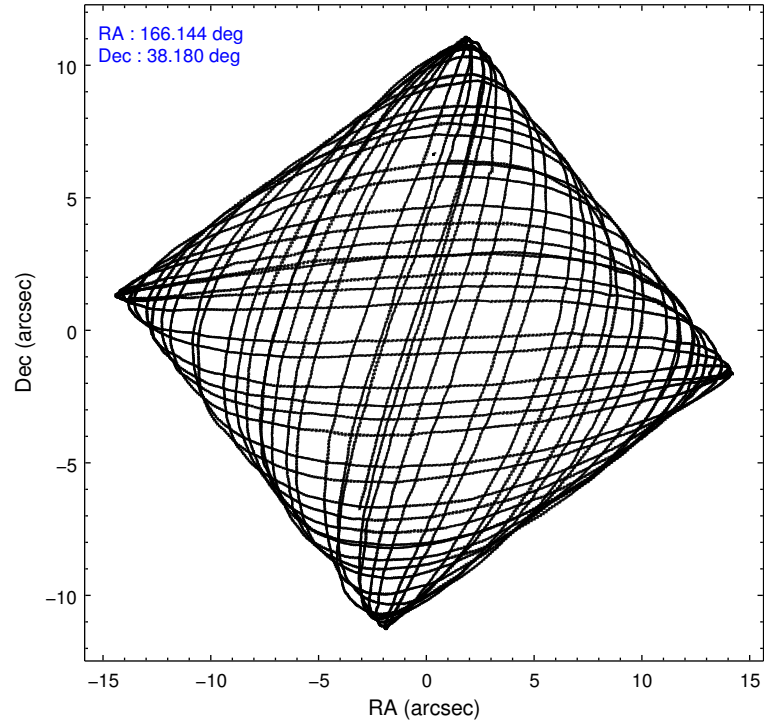
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
level 1 events	151541	154187	431954	264526	166924
rejected events	133578	134747	170514	151131	148948
rejected %	88%	87%	39%	57%	89%

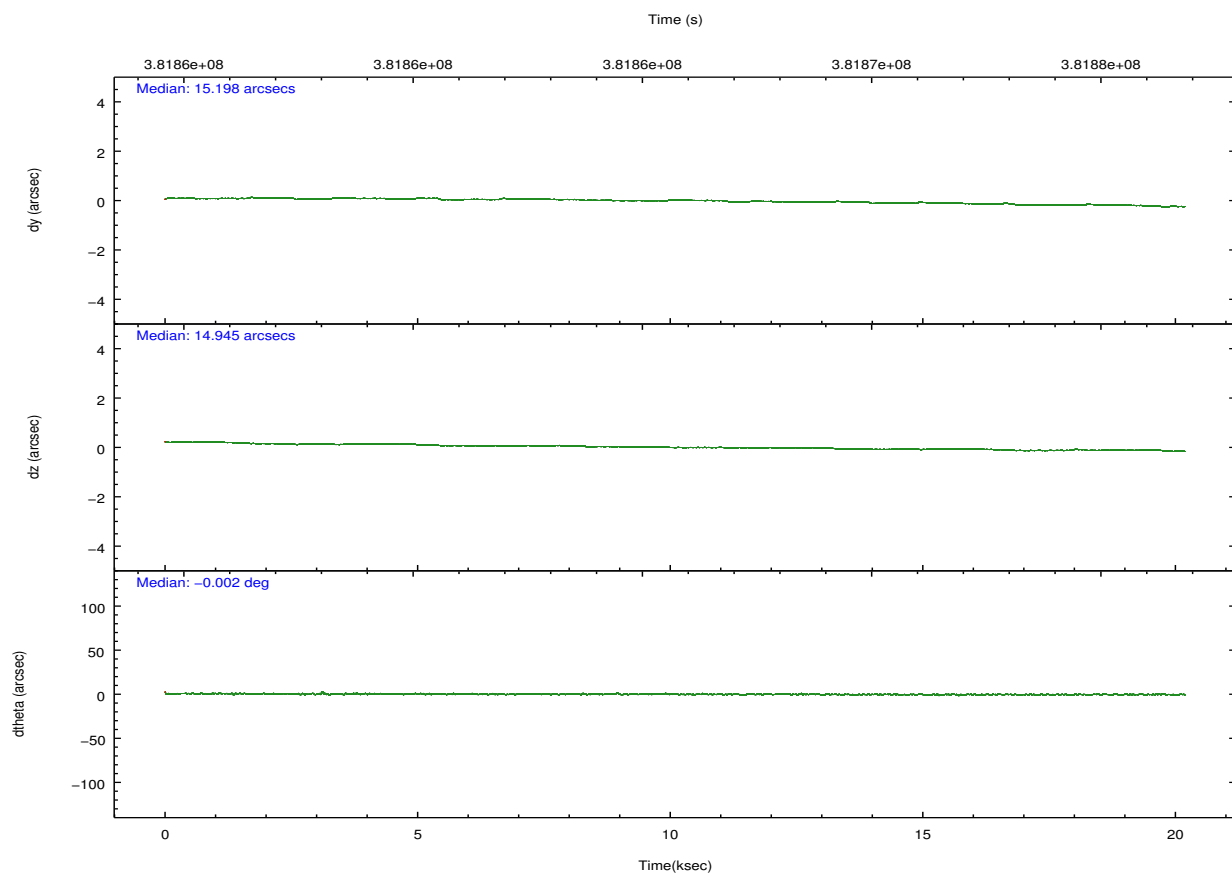
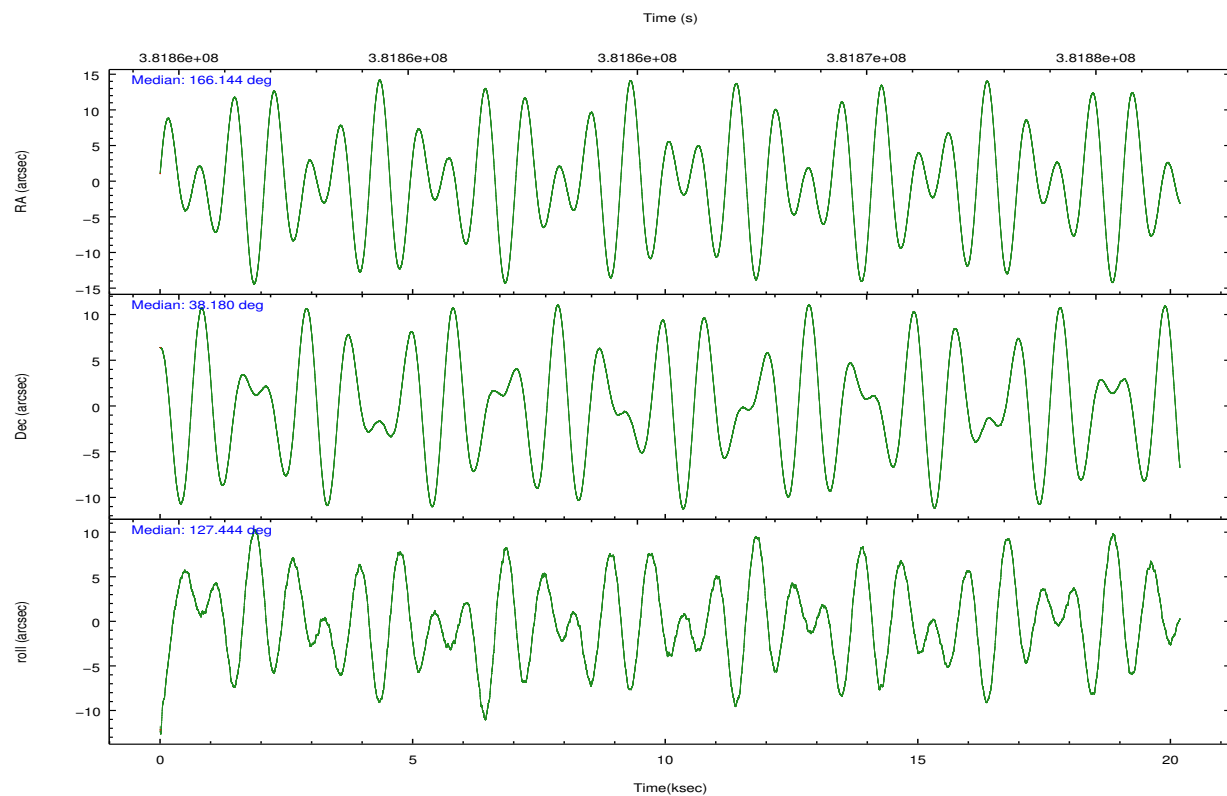
	ccd 0	ccd 1	ccd 2	ccd 3	ccd 6
grade 0 events	6483	6848	199416	88313	6320
	4%	4%	46%	33%	3%
grade 1 events	85	104	7442	1964	76
	0%	0%	1%	0%	0%
grade 2 events	4357	4541	29345	12238	4039
	2%	2%	6%	4%	2%
grade 3 events	1939	2016	10813	4147	1956
	1%	1%	2%	1%	1%
grade 4 events	1800	2001	10785	4185	1839
	1%	1%	2%	1%	1%
grade 5 events	6403	6941	10207	8035	6785
	4%	4%	2%	3%	4%
grade 6 events	3392	4041	11144	4544	3827
	2%	2%	2%	1%	2%
grade 7 events	127082	127695	152802	141100	142082
	83%	82%	35%	53%	85%

## 2.2 Compared Parameters

Parameter	Planned	Actual	Parameter	Planned	Actual
Instrument	ACIS	ACIS	Obspar format version number	7	7
Detector	ACIS-01236	ACIS-01236	Obspar file type	PREDICTED	ACTUAL
Grating	LETG	LETG	Obspar update status	NONE	UPDATED
Data mode	FAINT	FAINT	Number of optional ACIS chips dropped	0	0
Observation mode	POINTING	POINTING	On-chip summing requested	N	N
[deg] Pointing RA	166.176169	166.1438274142219	Subarray requested	NONE	NONE
[deg] Pointing Dec	38.169725	38.18018245496574	Alternating exposures requested	N	N
[deg] Pointing Roll	127.224184	127.4528579988458	[s] Primary exposure time	0.000000	3.1
[s] Window start time (MET)	378691266.184000	378691266.184000			
[s] Window stop time (MET)	383702466.184000	383702466.184000			
[mm] SIM focus pos	-0.782348	-0.7809083437167272			
[mm] SIM defocus	0	0.001439871863259334			
[mm] SIM translation stage pos	-223.402463	-223.4094861201138			
[mm] SIM translation stage offset	-10.19	-10.18296688281589			
[s] Observation start time (MET)	381855804.184000	381855428.17185			
Observation start date	2010-02-06T15:02:18	2010-02-06T14:57:08			
[s] Observation end time (MET)	381875804.184000	381875938.42289			
Observation end date	2010-02-06T20:35:38	2010-02-06T20:38:58			
Read mode	TIMED	TIMED			

## 2.3 Aspect



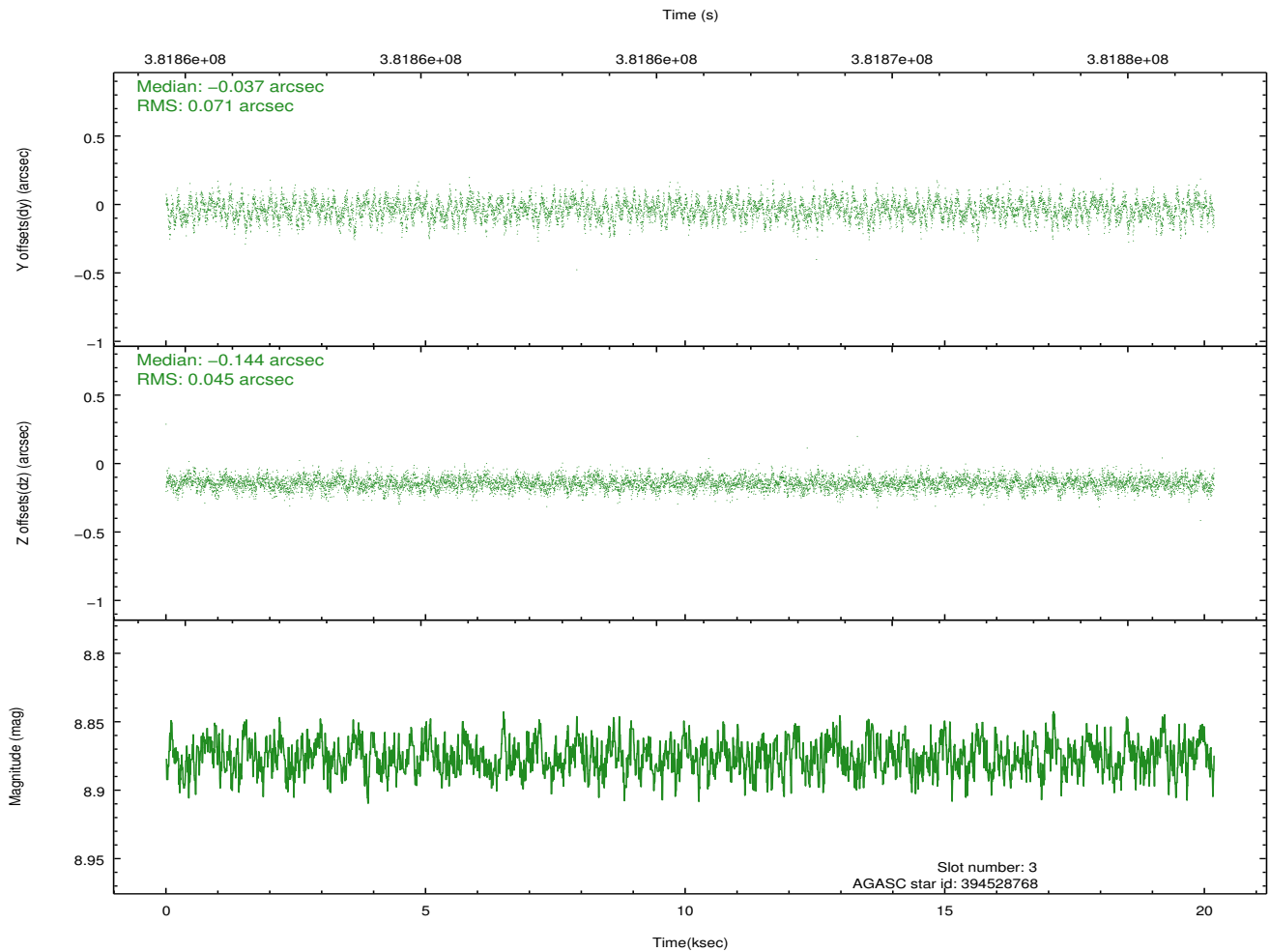
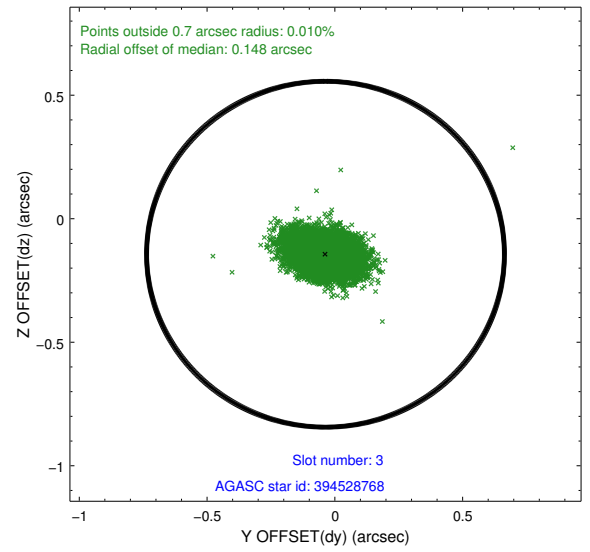
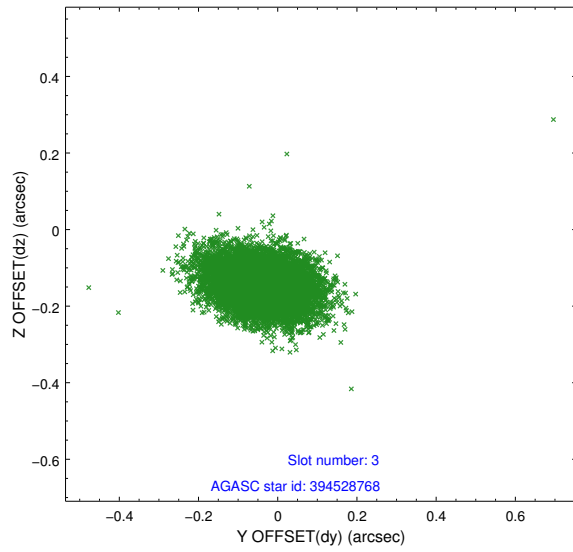


### Slot Statistics

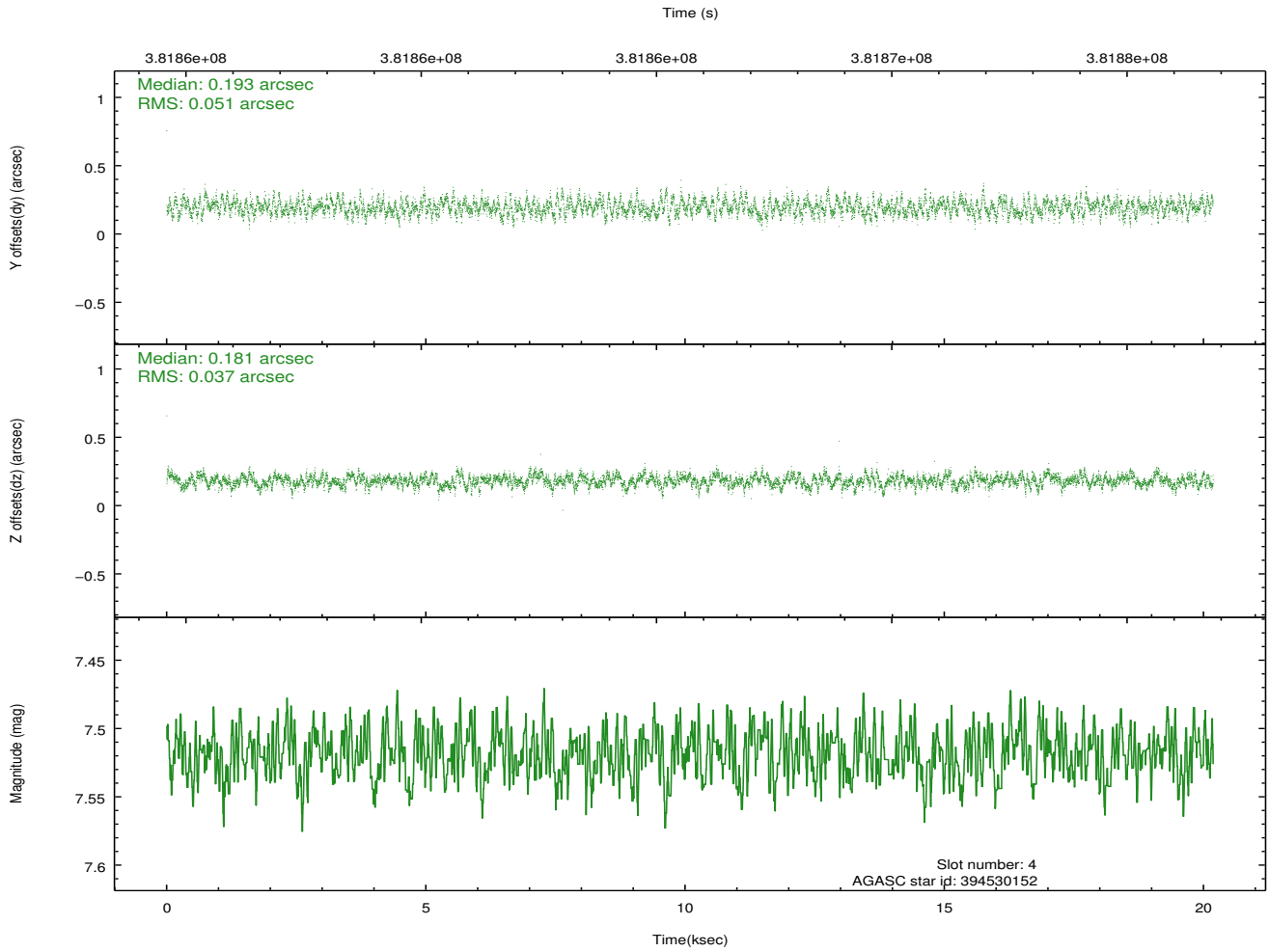
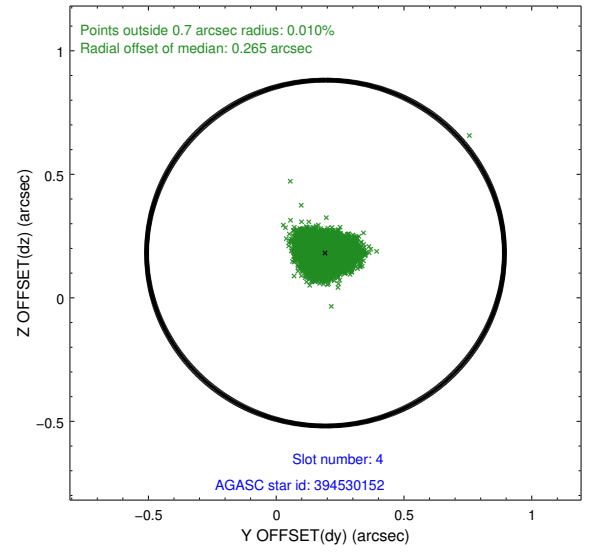
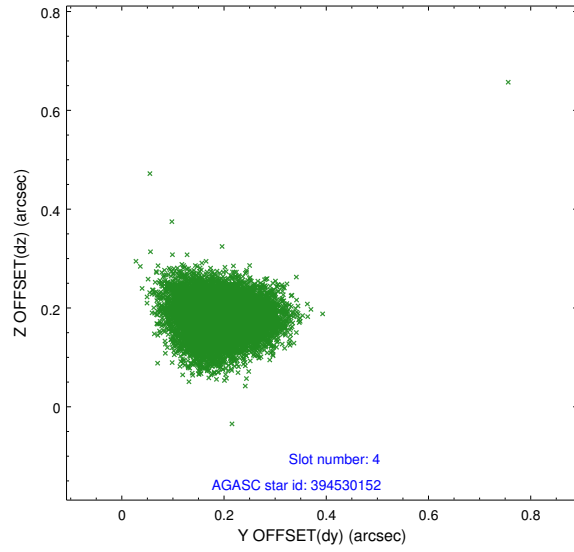
slot	status	id	mag	n_pts	med_dy	med_dz	dr1	dr2	ra	dec	mean_y	mean_z
0	FID	ACIS-I-1	7.03	4924	0.172	-0.153	0.009	0.015	0.000000	0.000000	924.27	-1047.78
1	FID	ACIS-I-5	7.04	4924	-0.330	0.127	0.007	0.011	0.000000	0.000000	-1824.25	849.84
2	FID	ACIS-I-6	7.05	4924	0.067	0.097	0.008	0.013	0.000000	0.000000	389.50	1494.54
3	GUIDE	394528768	8.88	9845	-0.037	-0.144	0.087	0.148	166.180365	38.952248	2236.48	-1713.14
4	GUIDE	394530152	7.52	9848	0.193	0.181	0.067	0.108	166.075805	38.868252	2173.53	-1296.96
5	GUIDE	394533744	8.90	9843	-0.295	-0.084	0.075	0.120	167.094985	37.988717	-2085.28	-1689.96
6	GUIDE	394533848	8.74	9839	0.194	0.053	0.079	0.130	166.382906	38.276007	-45.44	-694.82
7	GUIDE	394546712	6.59	9847	-0.055	-0.010	0.060	0.096	166.451462	38.394357	175.59	-1107.68

## 2.4 Star Slots

### 2.4.1 Slot 3

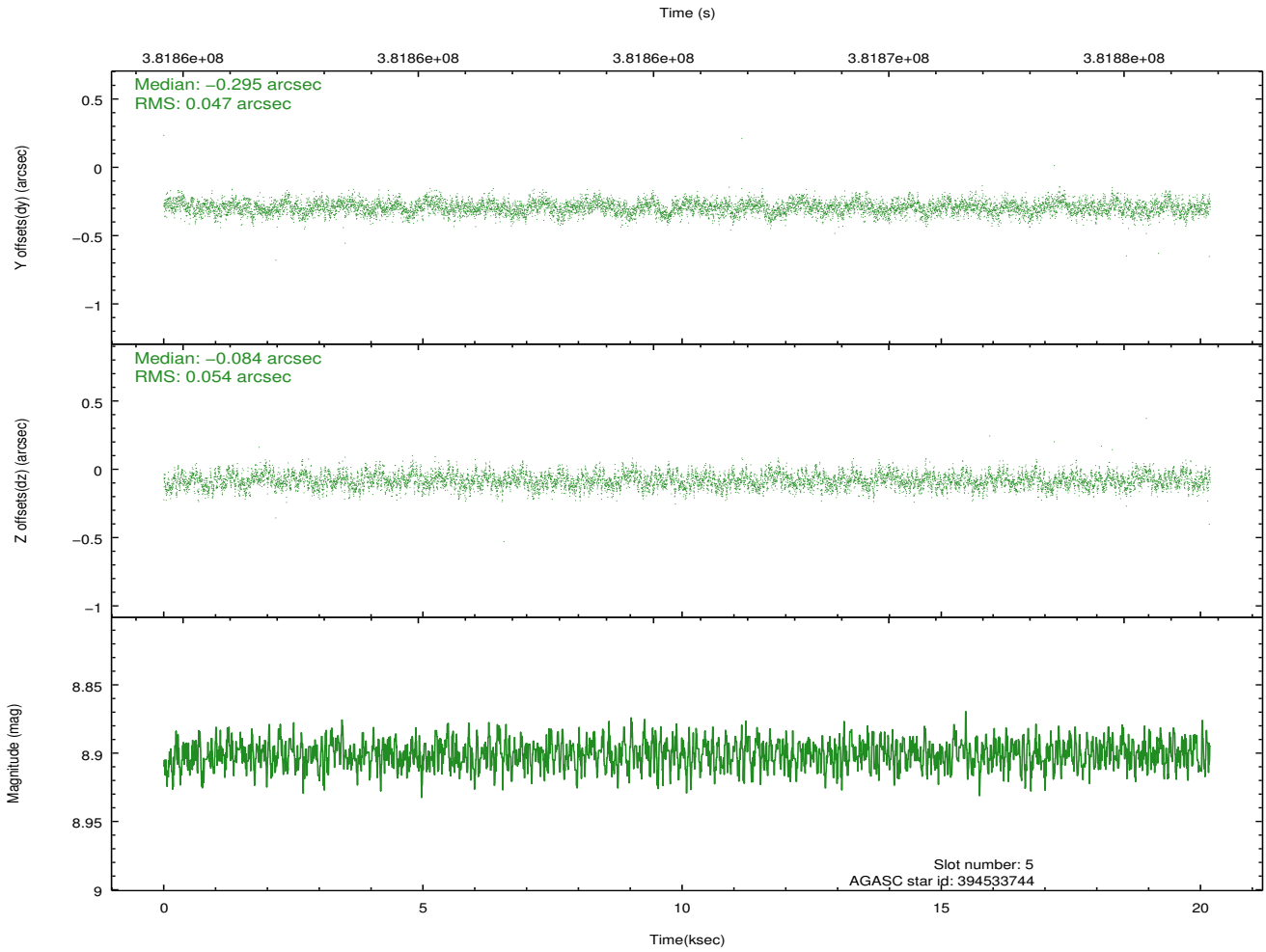
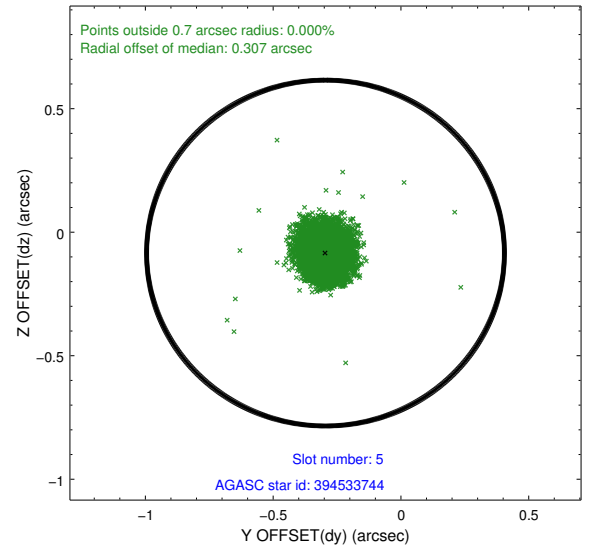
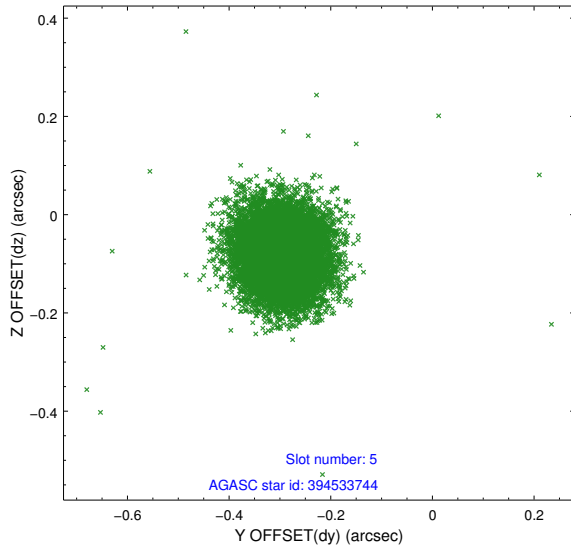


## 2.4.2 Slot 4

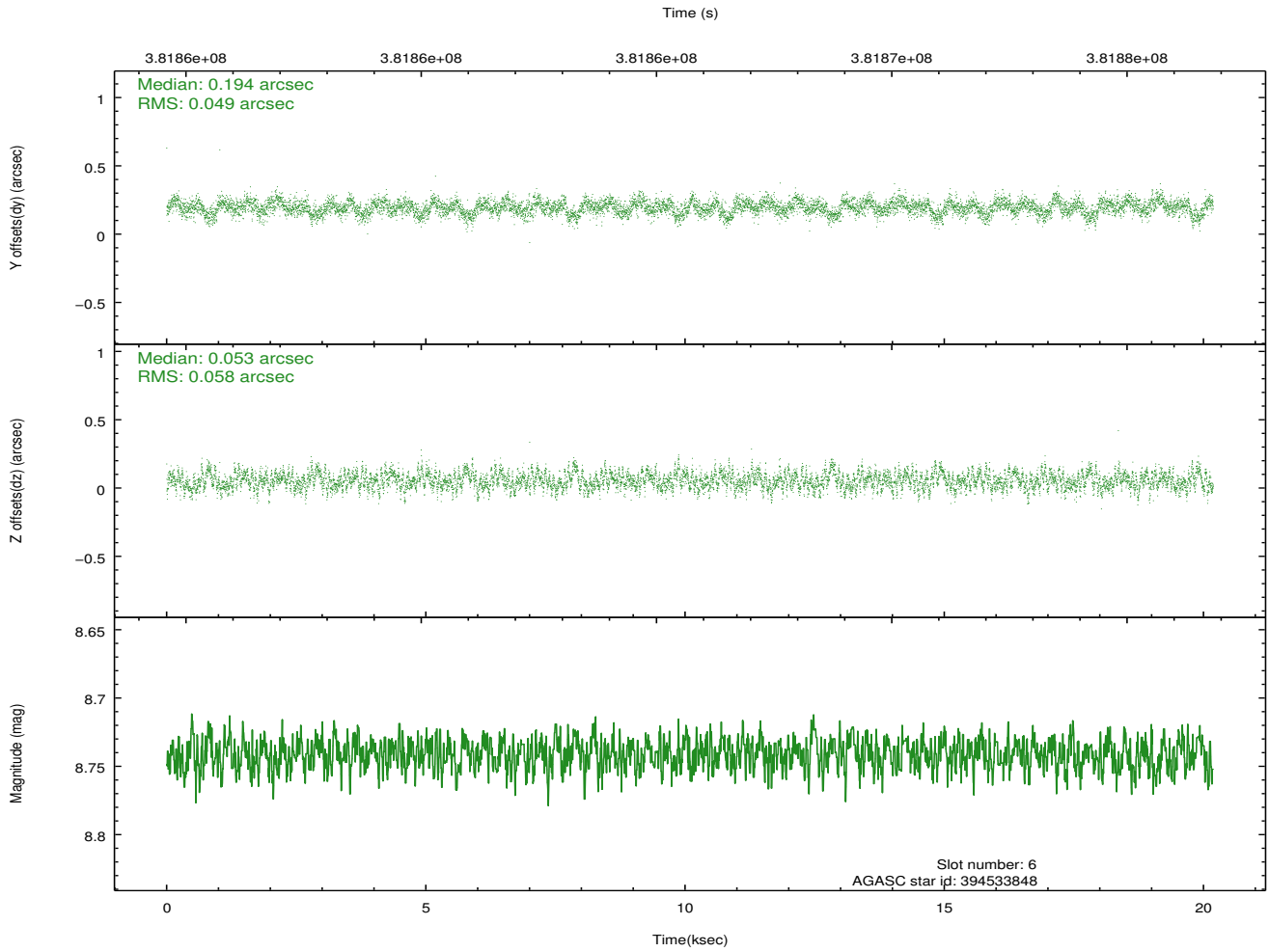
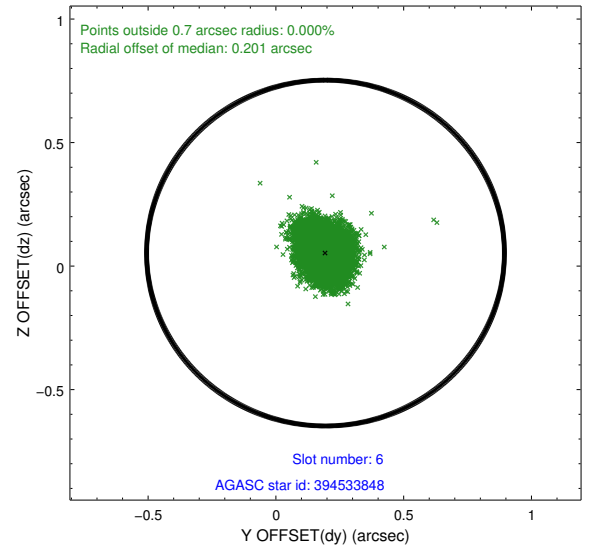
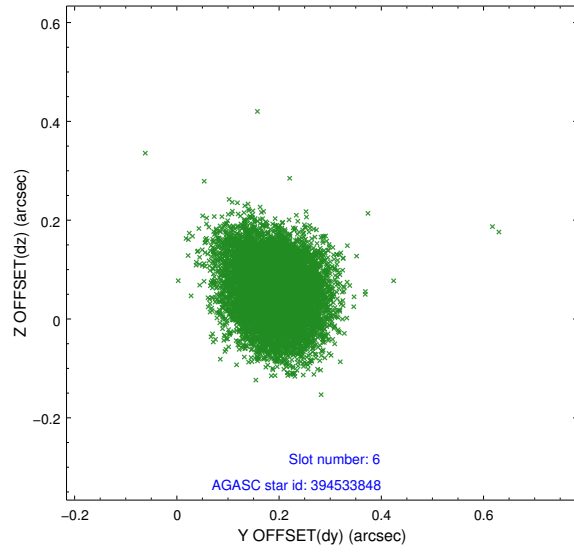




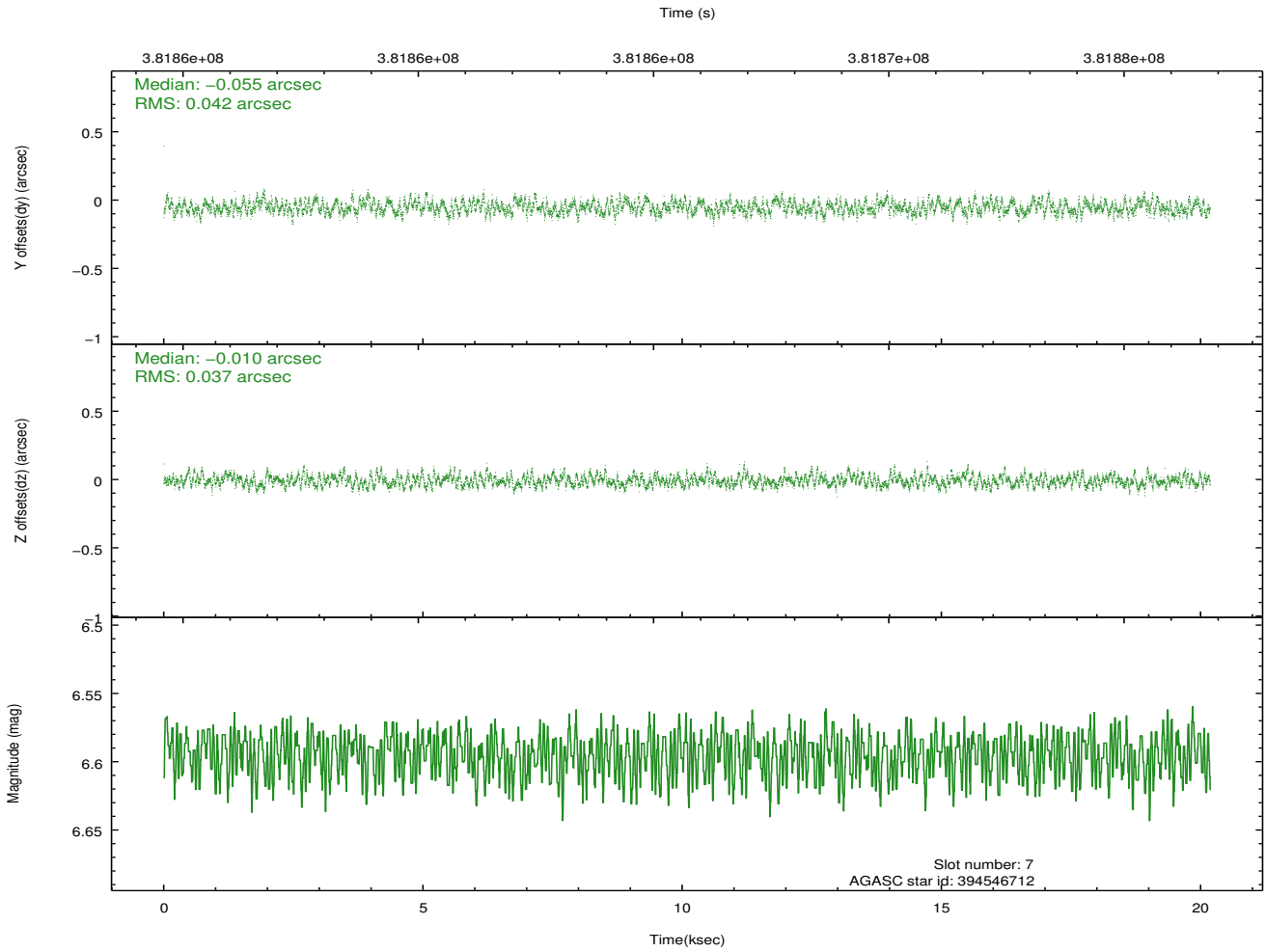
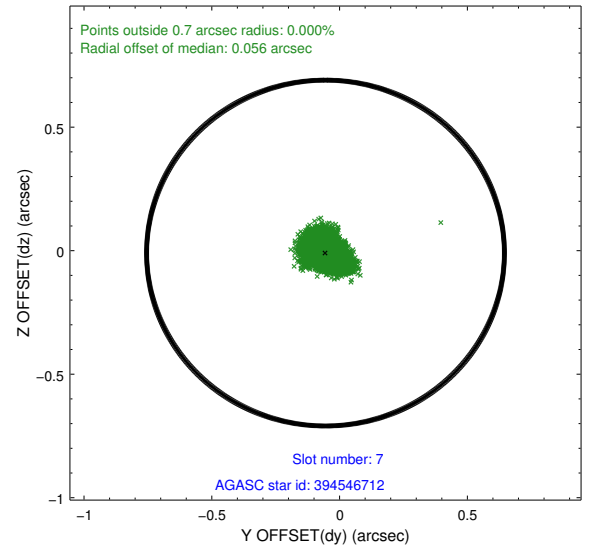
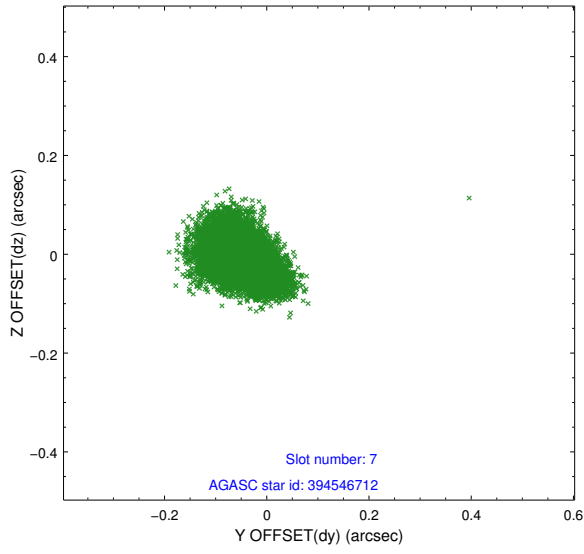
### 2.4.3 Slot 5



## 2.4.4 Slot 6

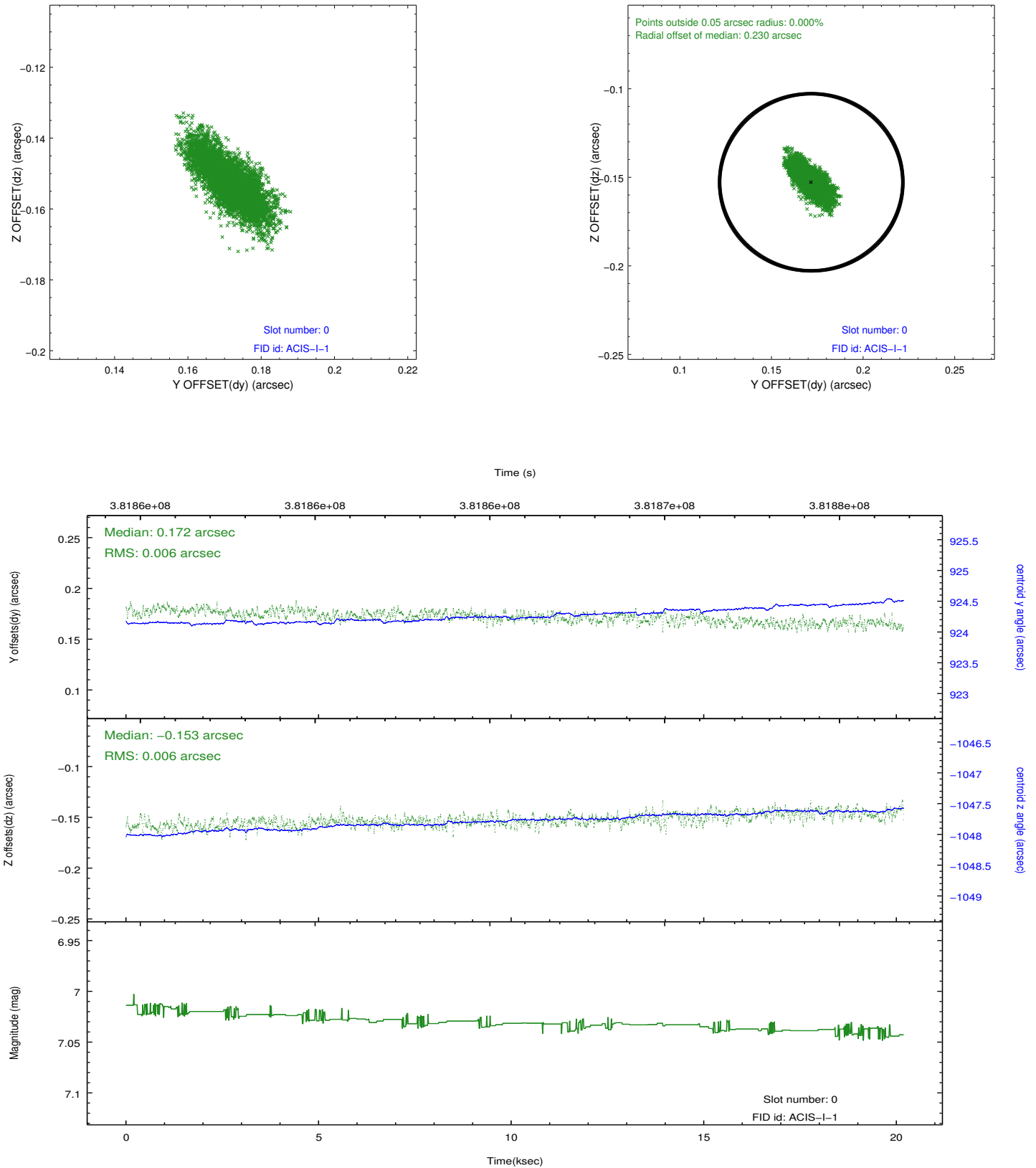


## 2.4.5 Slot 7

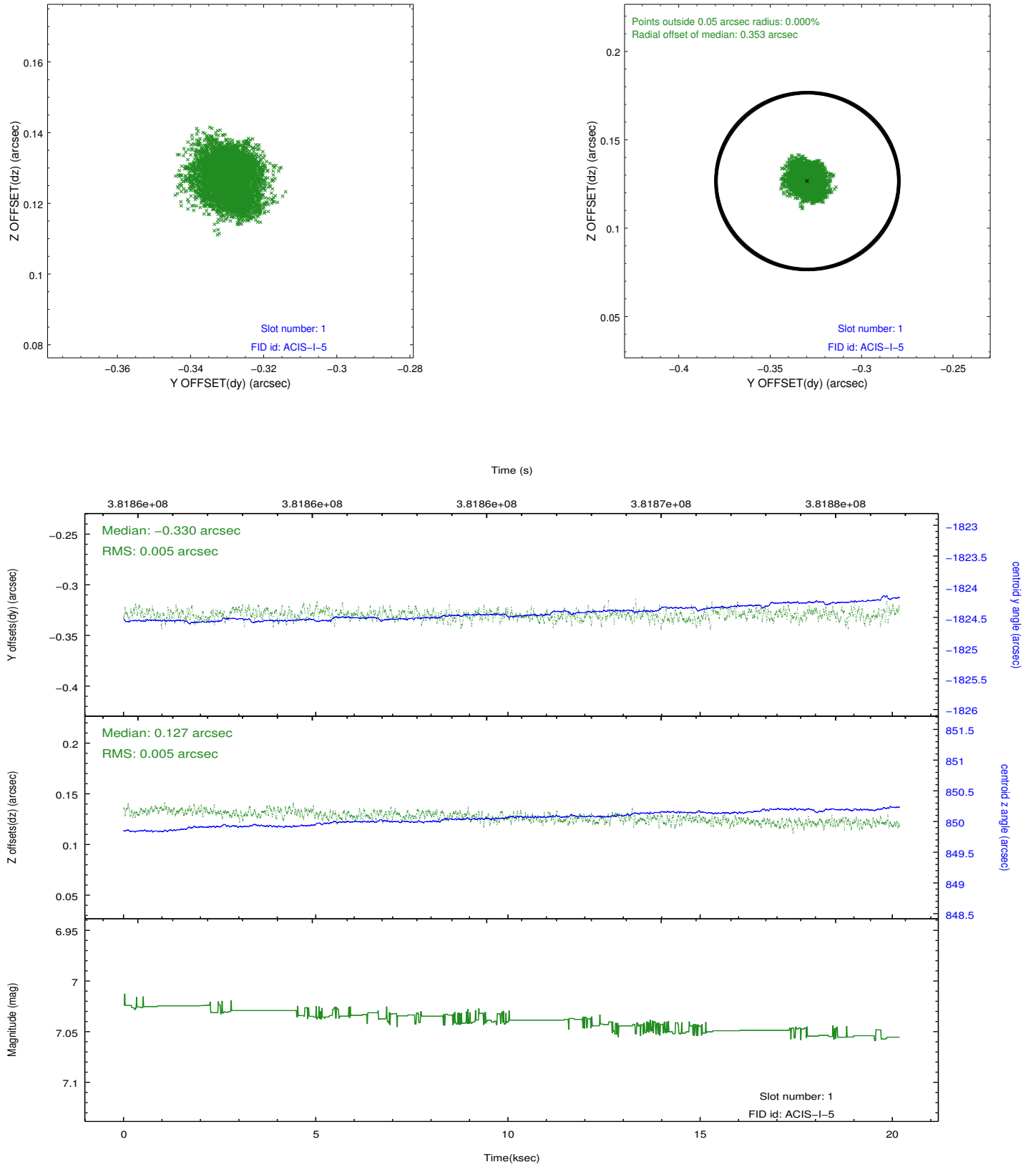


## 2.5 FID Slots

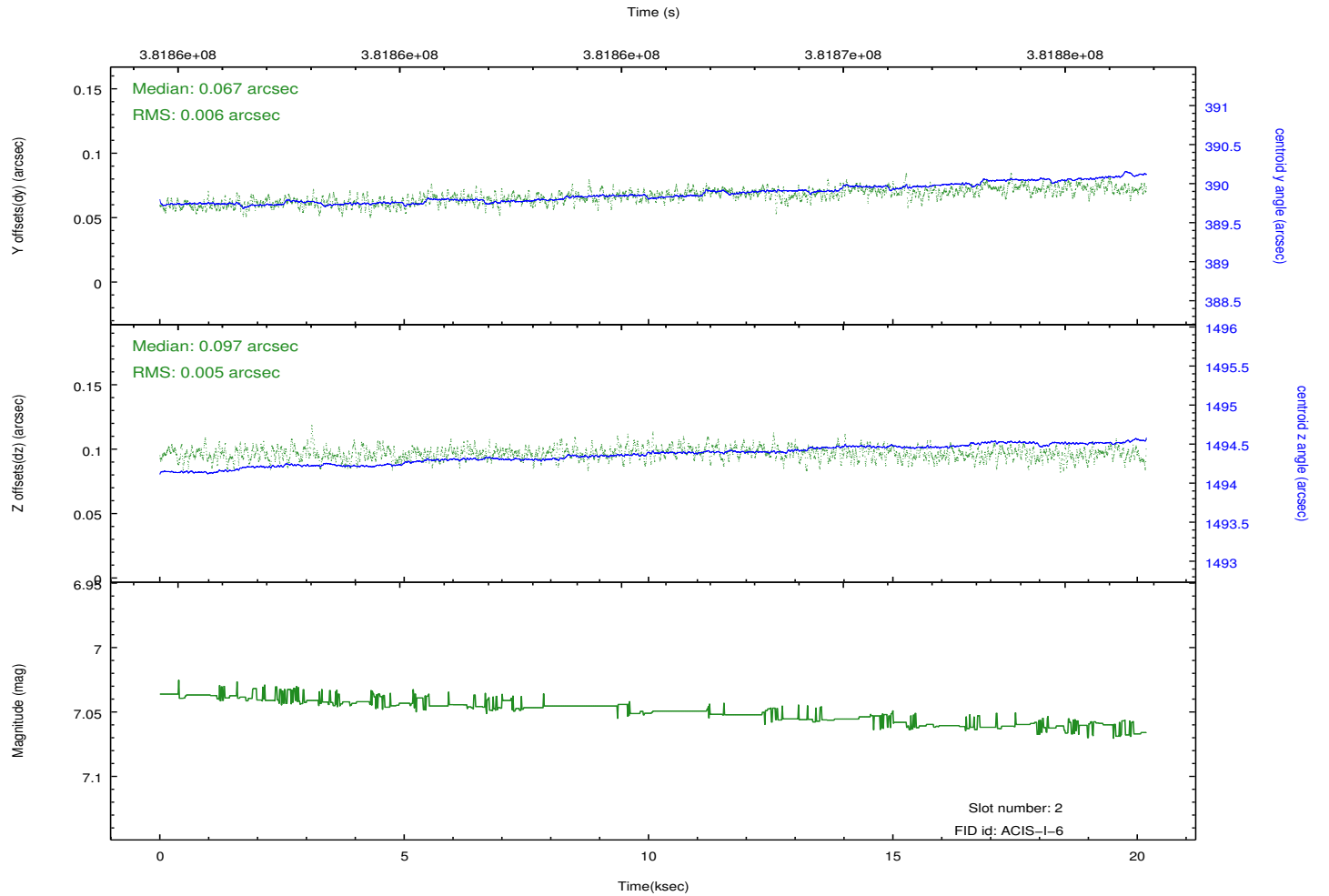
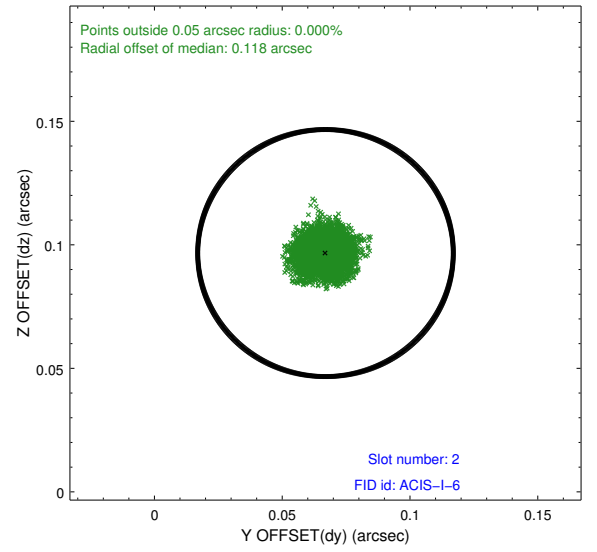
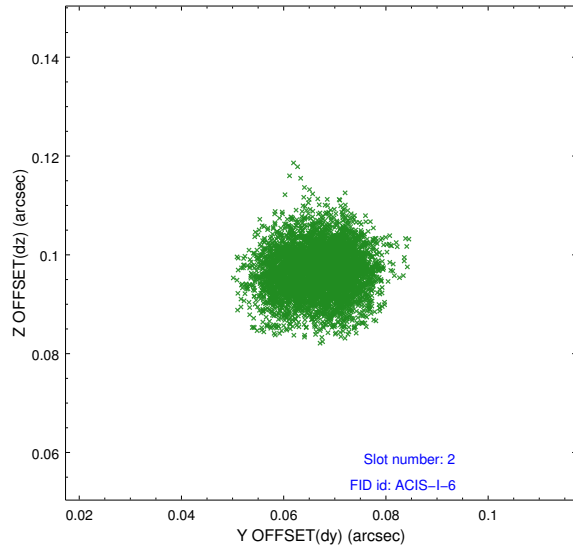
### 2.5.1 Slot 0



## 2.5.2 Slot 1

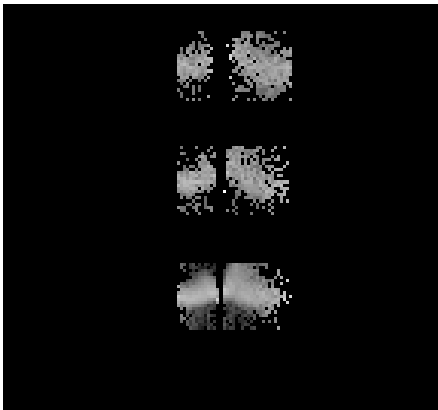


### 2.5.3 Slot 2

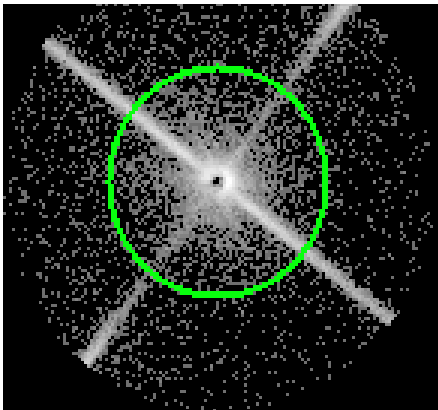


# 3 Gratings

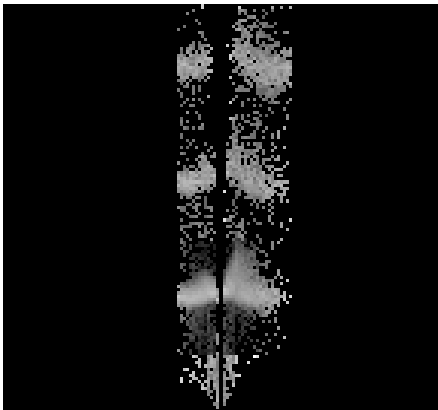
## 3.1 LETG Arm



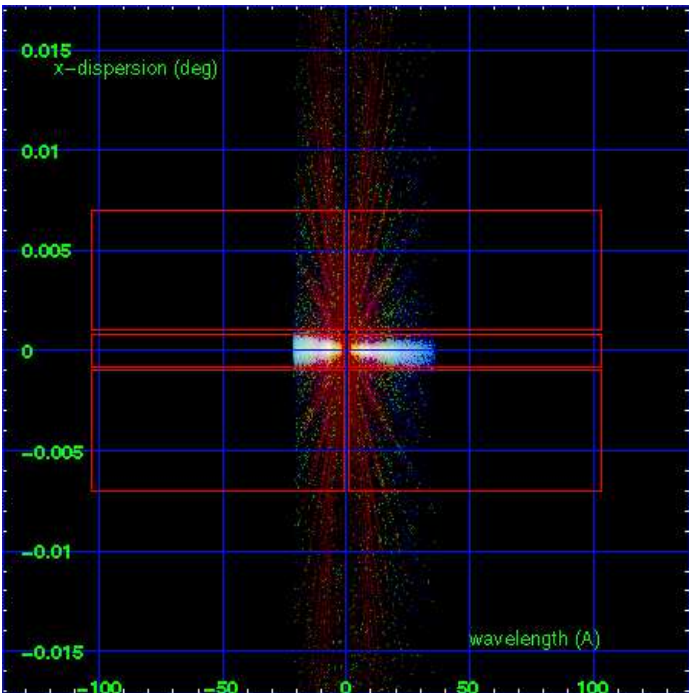
LETG Order Sort 123



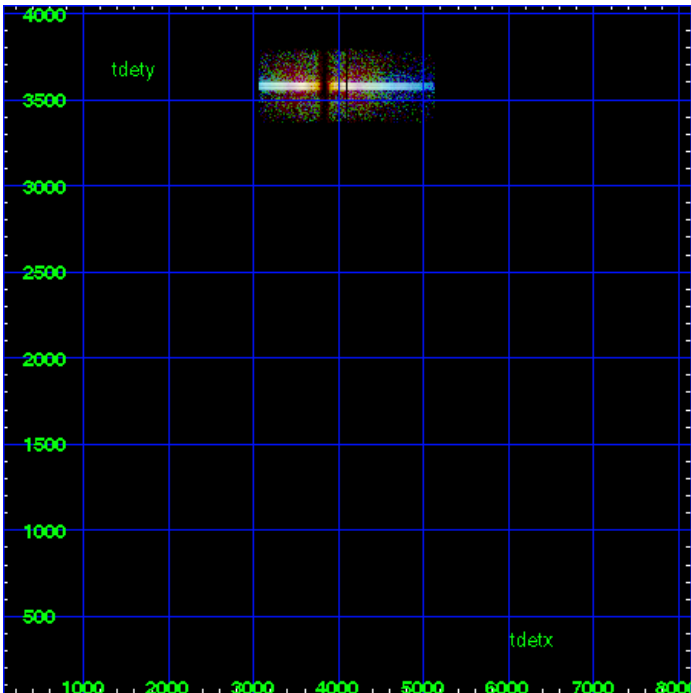
LETG Zero Order



LETG Order Sort ALL

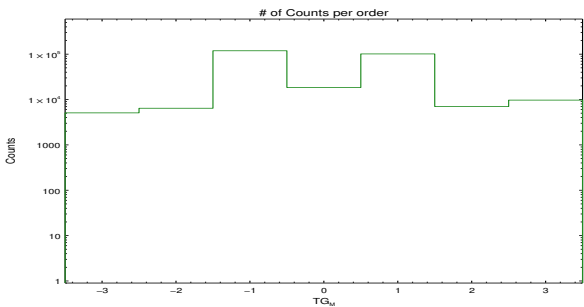


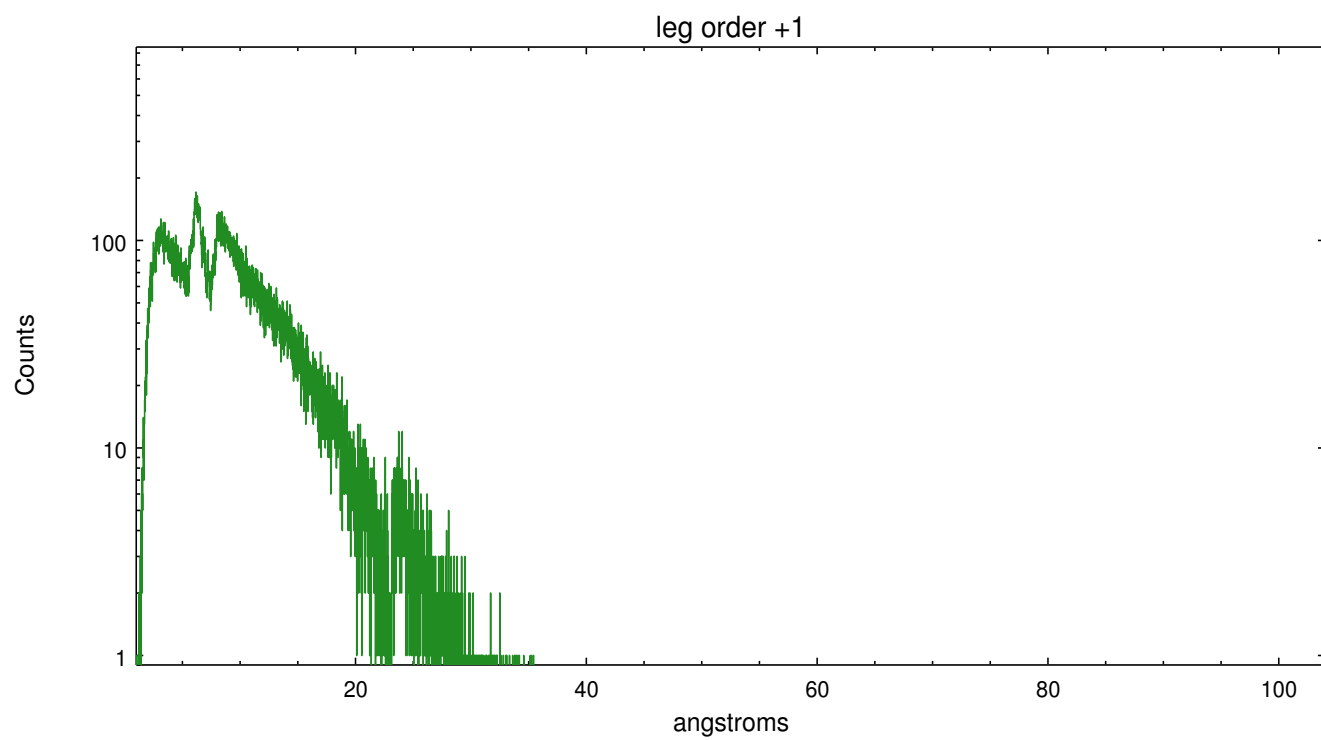
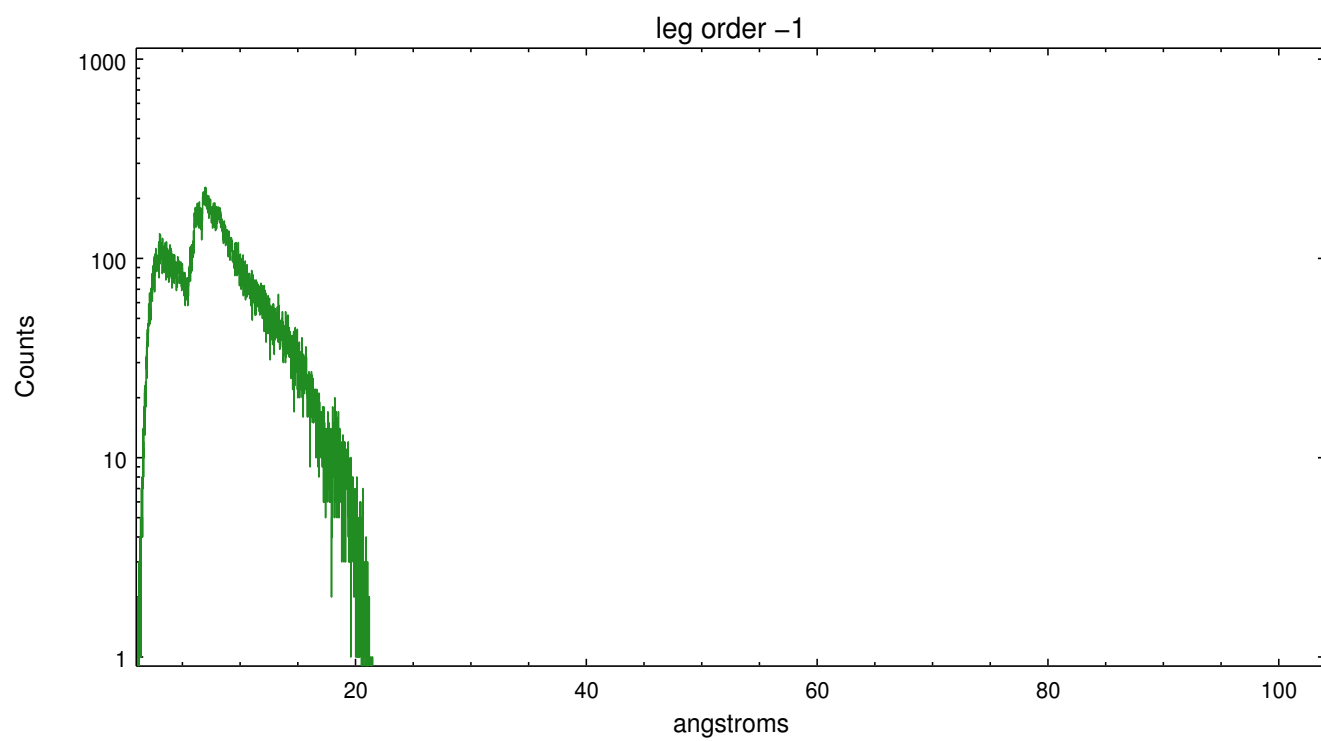
Spot Image LETG



Full Detector LETG

	order -3	order -2	order -1	order 0	order 1	order 2	order 3
Events	5085	6421	119005	18406	101346	7007	9707







# A Summary

## A.1 Status

V&V Scientist	Joy Nichols
V&V Date (YYYY-MM-DD)	2012.07.23
V&V Edition	1
V&V Disposition and Status	OK
V&V Charge Time	19.770486053646

## A.2 Comments

Used flat order-sorting in `tg_resolve_events`, since there is no 'osip' table for ACIS-I.

===

```
pset grt_lev15 osipfile=none===
```

```
pset grt_lev15 osort_lo=0.3===
```

```
pset grt_lev15 osort_hi=0.3===
```

===

Zeroth order piled up. Standard data processing software did not correctly locate the zeroth order due to pileup. Manual intervention was used to input the correct sky coordinates ( $x=4269.94$ ,  $y=4307.81$ ) into the `*src1a.fits` file table. These corrected coordinates were determined using a software tool developed by CXU 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.