

V&V Reference Report

L2 ASCDS Version : 8.4.5

Observation 11986 - L2 Version 3
Chandra X-Ray Center

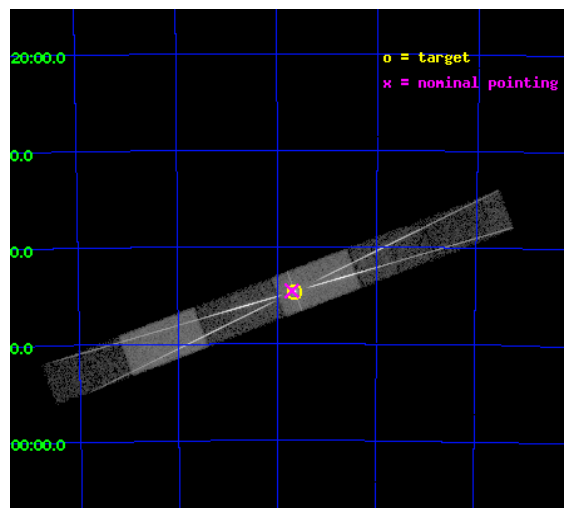
L2 Processing Date : Jun 19 2012

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1 Front

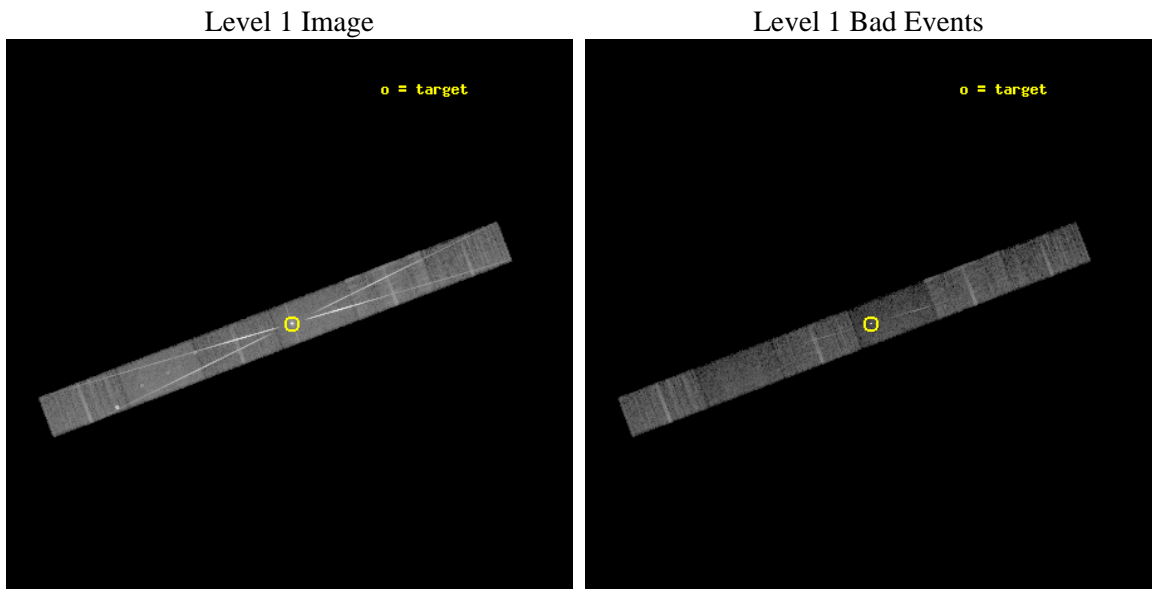
| | | |
|----------|---|---|
| seq_num | 401109 | Sequence number |
| obs_id | 11986 | Observation id |
| title | Deep Chandra Observations of the Black Hole LMC X-1 | Proposal title |
| observer | Dr. Michael Nowak | Principal investigator |
| object | LMC X-1 | Source name |
| dtycycle | 0 | |
| cycle | P | events from which exps? Prim/Second/Both |
| ra_targ | 84.911667 | Observer's specified target RA [deg] |
| dec_targ | -69.74325 | Observer's specified target Dec [deg] |
| ra_nom | 84.925433554685 | Nominal RA [deg] |
| dec_nom | -69.74233894574 | Nominal Dec [deg] |
| roll_nom | 339.16953571852 | Nominal Roll [deg] |
| revision | 3 | Processing version of data |
| ontime | 8185.4999426603 | Sum of GTIs [s] |
| livetime | 7992.5503736402 | Livetime [s] |
| ontime4 | 8185.4999426603 | Sum of GTIs [s] |
| ontime5 | 8185.4999426603 | Sum of GTIs [s] |
| ontime6 | 8185.4999426603 | Sum of GTIs [s] |
| ontime7 | 8185.4999426603 | Sum of GTIs [s] |
| ontime8 | 8185.4999426603 | Sum of GTIs [s] |
| ontime9 | 8185.4999426603 | Sum of GTIs [s] |
| l2events | 203953 | Number of level 2 events |



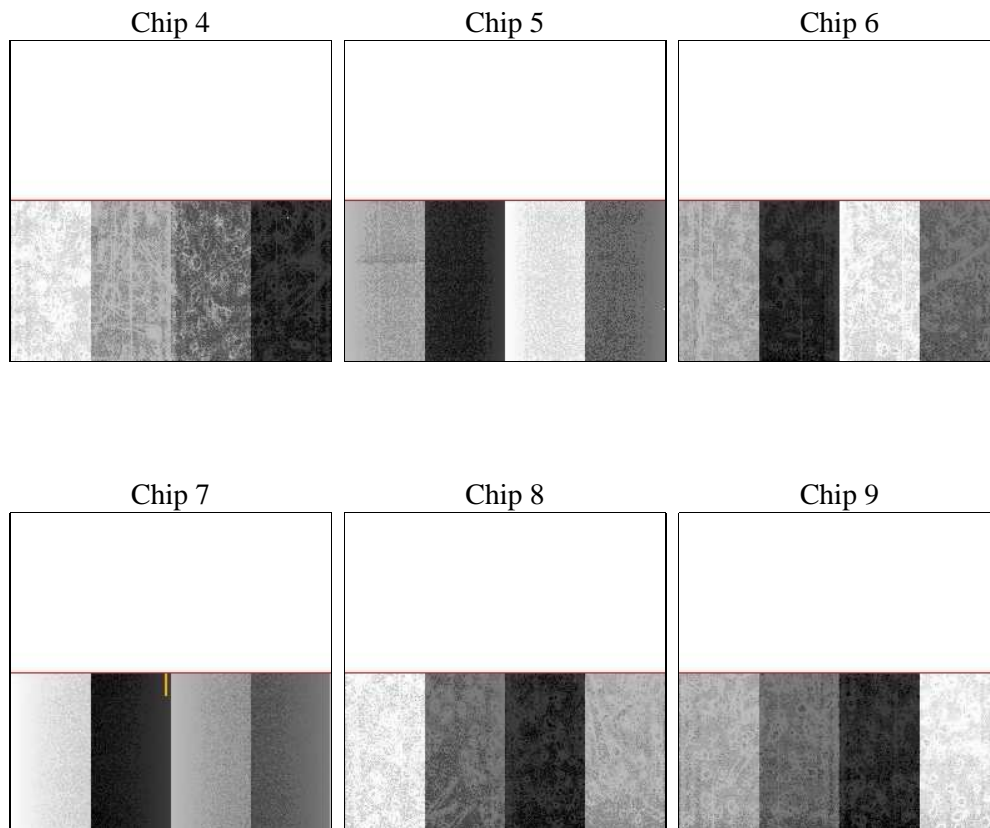
2 OBI

2.1 OBI

2.1.1 Images



2.1.2 Bias



2.1.3 Parameters

| | | | | | |
|----------|---------------------|--------------------------------|----------------|-----------------|---|
| obi_num | 0 | Obi number | sched_exp_time | 8000.000000 | [s] Scheduled observation exposure time |
| ascdsver | 8.4.5 | Processing system revision | ontime | 8185.4999426603 | Sum of GTIs [s] |
| caldbver | 4.4.10 | | ontime4 | 8185.4999426603 | Sum of GTIs [s] |
| date | 2012-06-19T07:28:44 | Date and time of file creation | ontime5 | 8185.4999426603 | Sum of GTIs [s] |
| revision | 2 | Processing version of data | ontime6 | 8185.4999426603 | Sum of GTIs [s] |
| | | | ontime7 | 8185.4999426603 | Sum of GTIs [s] |
| | | | ontime8 | 8185.4999426603 | Sum of GTIs [s] |
| | | | ontime9 | 8185.4999426603 | Sum of GTIs [s] |
| | | | l1events | 437484 | Number of level 1 events |

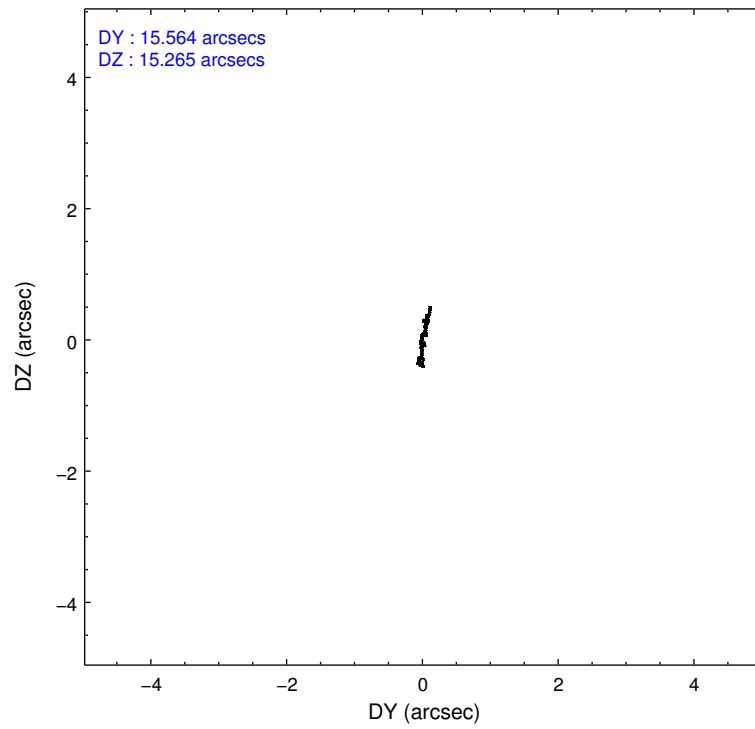
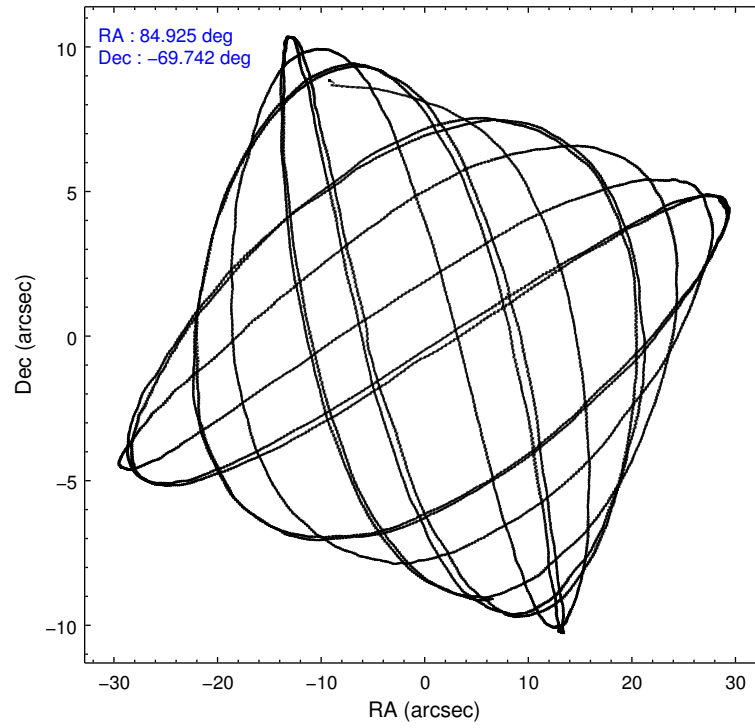
2.1.4 Events

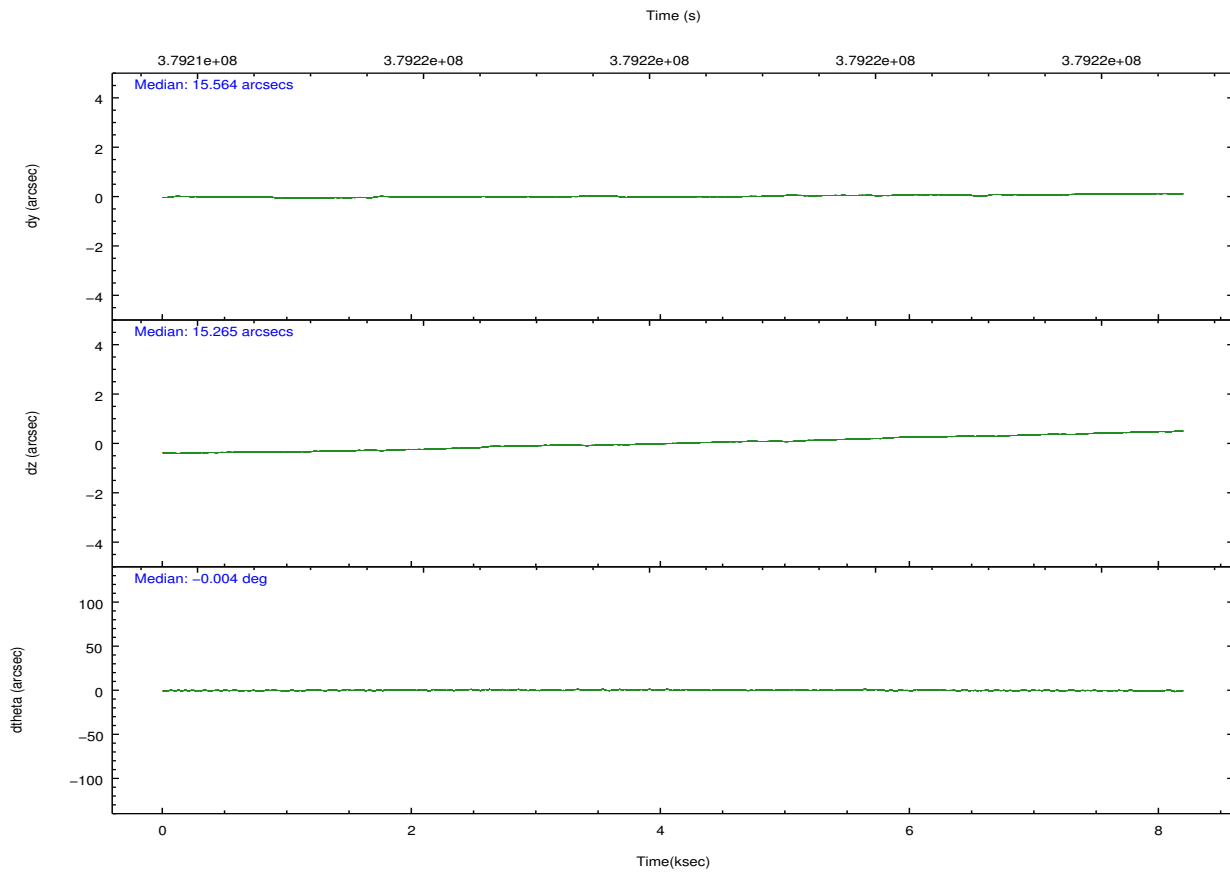
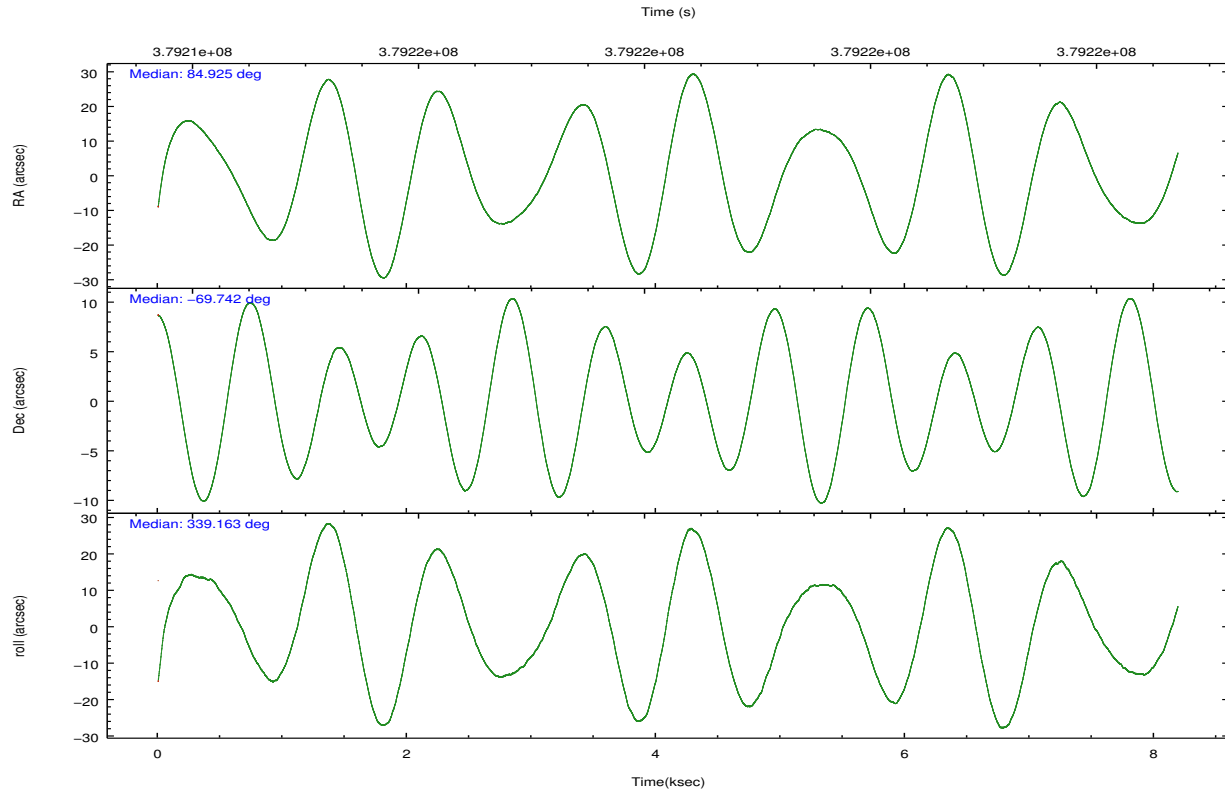
| | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 | | ccd 4 | ccd 5 | ccd 6 | ccd 7 | ccd 8 | ccd 9 |
|-----------------|-------|-------|-------|--------|-------|-------|----------------|-------|-------|-------|-------|-------|-------|
| level 1 events | 52362 | 67791 | 96026 | 100203 | 78711 | 42391 | grade 0 events | 6684 | 8075 | 44520 | 14250 | 23515 | 5134 |
| rejected events | 42601 | 27990 | 37743 | 26089 | 41338 | 33695 | | 12% | 11% | 46% | 14% | 29% | 12% |
| rejected % | 81% | 41% | 39% | 26% | 52% | 79% | grade 1 events | 50 | 146 | 343 | 235 | 144 | 27 |
| | | | | | | | | 0% | 0% | 0% | 0% | 0% | 0% |
| | | | | | | | grade 2 events | 1342 | 11493 | 7256 | 18566 | 5322 | 1342 |
| | | | | | | | | 2% | 16% | 7% | 18% | 6% | 3% |
| | | | | | | | grade 3 events | 577 | 2767 | 2506 | 8248 | 2475 | 718 |
| | | | | | | | | 1% | 4% | 2% | 8% | 3% | 1% |
| | | | | | | | grade 4 events | 638 | 2729 | 2457 | 8158 | 2314 | 692 |
| | | | | | | | | 1% | 4% | 2% | 8% | 2% | 1% |
| | | | | | | | grade 5 events | 1468 | 4528 | 1715 | 5319 | 2286 | 1641 |
| | | | | | | | | 2% | 6% | 1% | 5% | 2% | 3% |
| | | | | | | | grade 6 events | 778 | 15781 | 2433 | 26187 | 4298 | 978 |
| | | | | | | | | 1% | 23% | 2% | 26% | 5% | 2% |
| | | | | | | | grade 7 events | 40825 | 22272 | 34796 | 19240 | 38357 | 31859 |
| | | | | | | | | 77% | 32% | 36% | 19% | 48% | 75% |

2.2 Compared Parameters

| Parameter | Planned | Actual | Parameter | Planned | Actual |
|-----------------------------------|---------------------|----------------------|---------------------------------------|-----------|---------|
| Instrument | ACIS | ACIS | Obspar format version number | 7 | 7 |
| Detector | ACIS-456789 | ACIS-456789 | Obspar file type | PREDICTED | ACTUAL |
| Grating | HETG | HETG | Obspar update status | NONE | UPDATED |
| Data mode | FAINT | FAINT | CCD I0 on | N | N |
| Observation mode | POINTING | POINTING | CCD I1 on | N | N |
| [deg] Pointing RA | 84.847622 | 84.92543355468484 | CCD I2 on | N | N |
| [deg] Pointing Dec | -69.747052 | -69.74233894574022 | CCD I3 on | N | N |
| [deg] Pointing Roll | 338.939907 | 339.169535718517 | CCD S0 on | O1 | Y |
| [mm] SIM focus pos | -0.684267 | -0.6828225247311905 | CCD S1 on | Y | Y |
| [mm] SIM defocus | 0 | 0.001444936568705701 | CCD S2 on | Y | Y |
| [mm] SIM translation stage pos | -183.992523 | -183.9875365069546 | CCD S3 on | Y | Y |
| [mm] SIM translation stage offset | -6.14 | -6.144986076053243 | CCD S4 on | Y | Y |
| [s] Observation start time (MET) | 379214309.184000 | 379213288.6131 | CCD S5 on | Y | Y |
| Observation start date | 2010-01-07T01:17:23 | 2010-01-07T01:01:28 | Number of optional ACIS chips dropped | 0 | 0 |
| [s] Observation end time (MET) | 379222309.184000 | 379223289.0261 | On-chip summing requested | N | N |
| Observation end date | 2010-01-07T03:30:43 | 2010-01-07T03:48:09 | Subarray requested | CUSTOM | 1/2 |
| Read mode | TIMED | TIMED | Subarray start row | 1 | 1 |
| | | | Subarray row count | 512 | 512 |
| | | | Alternating exposures requested | N | N |
| | | | [s] Primary exposure time | 0.000000 | 1.7 |

2.3 Aspect



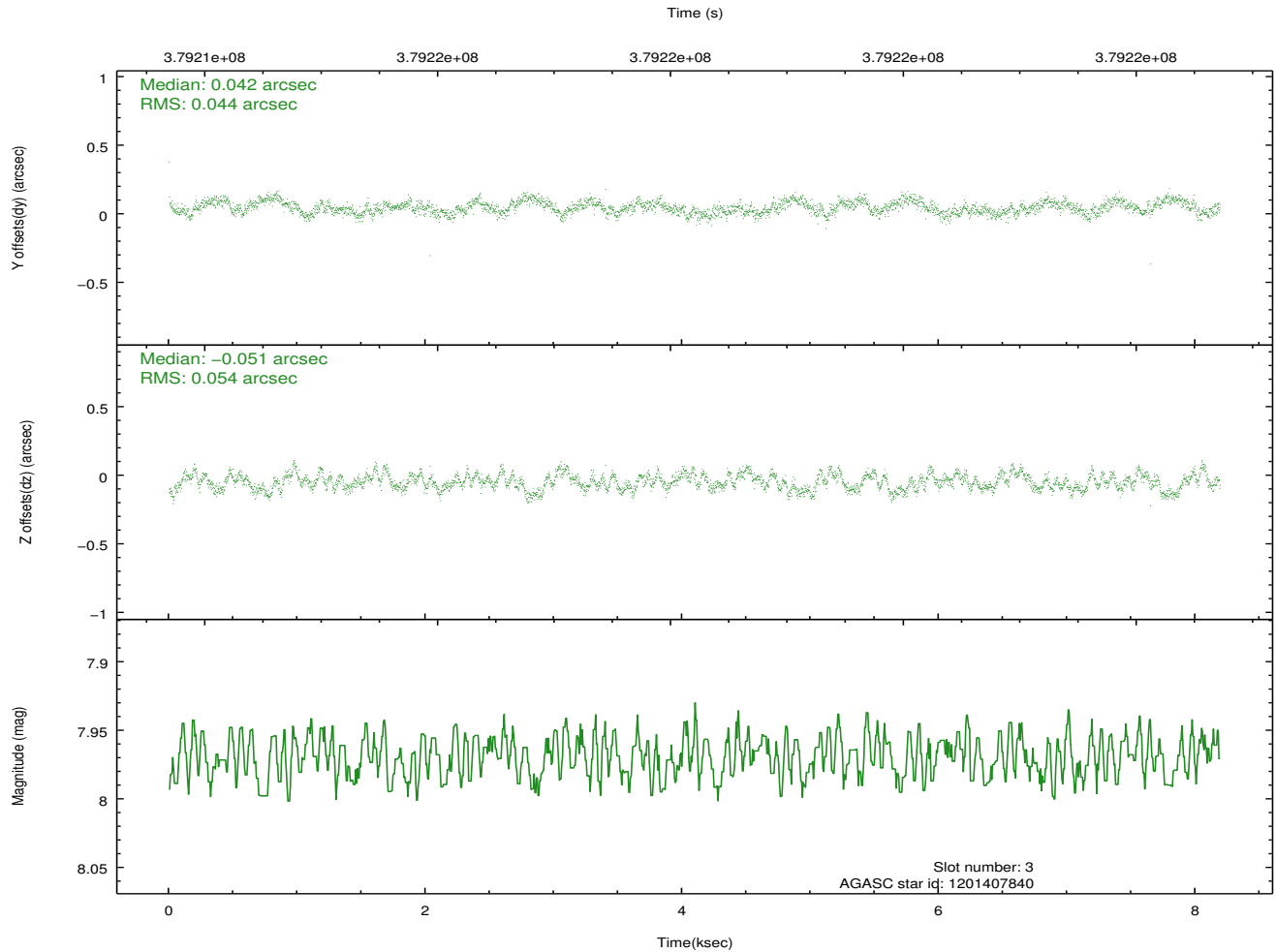
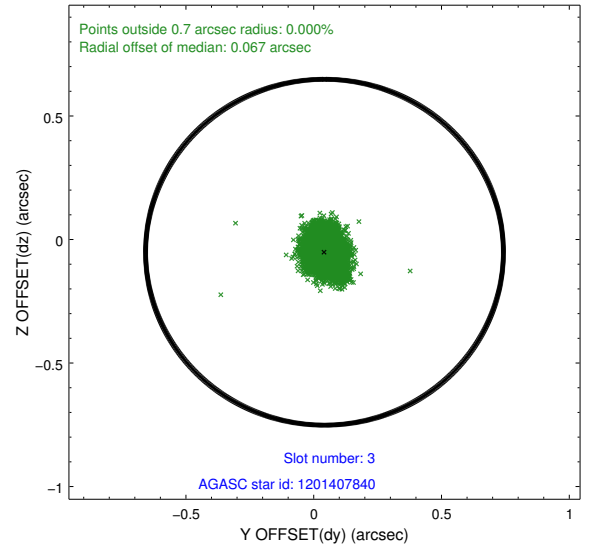
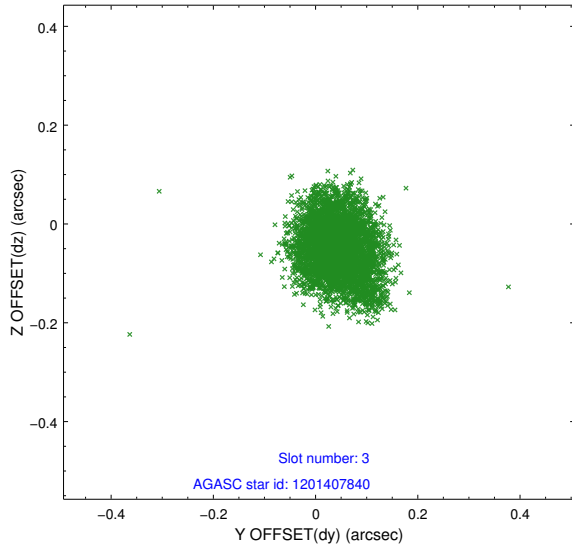


Slot Statistics

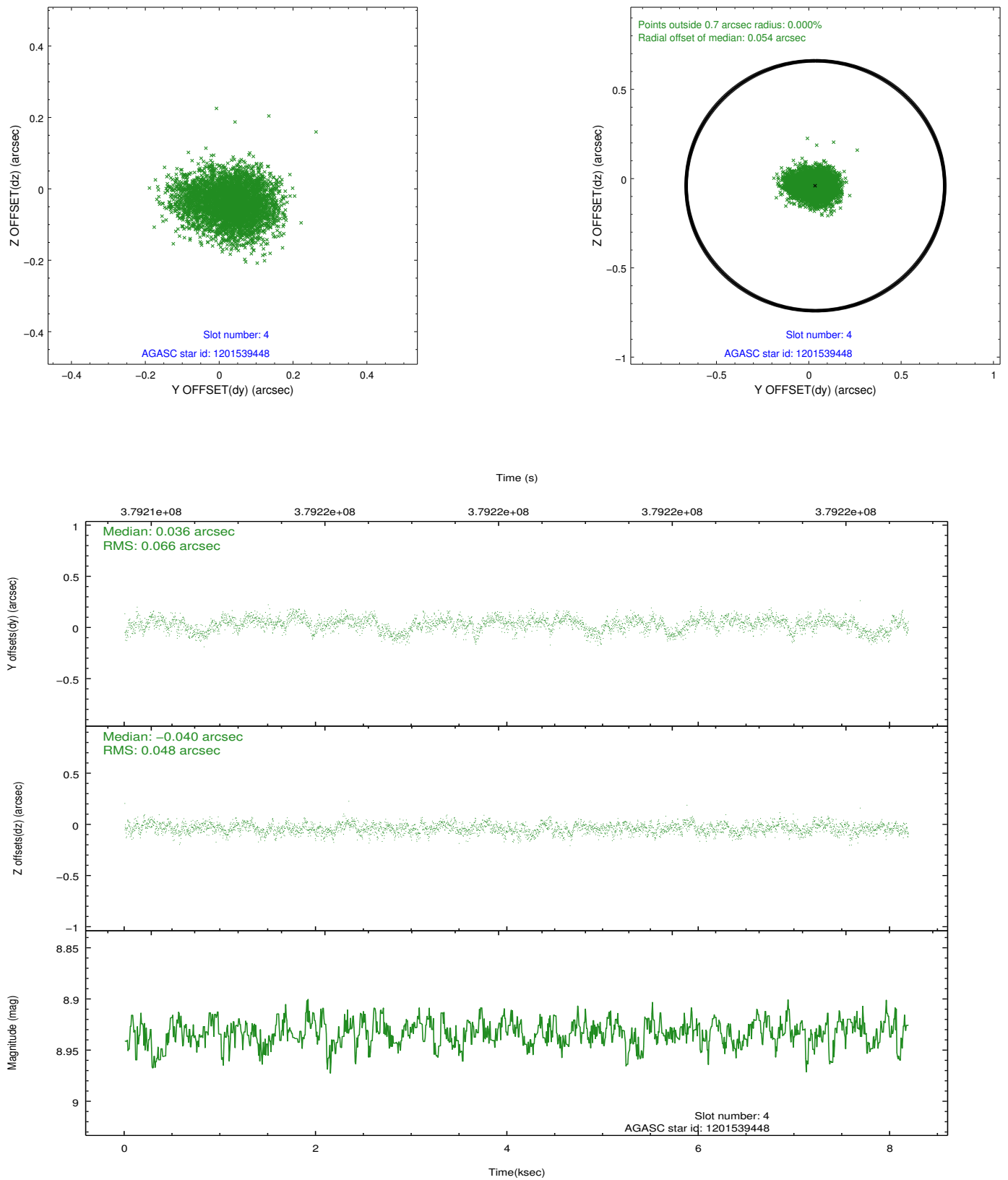
| slot | status | id | mag | n_pts | med_dy | med_dz | dr1 | dr2 | ra | dec | mean_y | mean_z |
|------|--------|------------|------|-------|--------|--------|-------|-------|-----------|------------|----------|----------|
| 0 | FID | ACIS-S-1 | 7.07 | 1998 | 0.059 | 0.115 | 0.012 | 0.019 | 0.000000 | 0.000000 | 927.90 | -1858.87 |
| 1 | FID | ACIS-S-4 | 7.06 | 1998 | 0.120 | -0.104 | 0.009 | 0.014 | 0.000000 | 0.000000 | 2145.80 | 44.26 |
| 2 | FID | ACIS-S-5 | 7.12 | 1997 | -0.206 | 0.001 | 0.007 | 0.012 | 0.000000 | 0.000000 | -1820.31 | 38.84 |
| 3 | GUIDE | 1201407840 | 7.97 | 3996 | 0.042 | -0.051 | 0.075 | 0.118 | 83.696303 | -70.172201 | -756.43 | -1945.97 |
| 4 | GUIDE | 1201539448 | 8.93 | 3985 | 0.036 | -0.040 | 0.087 | 0.142 | 85.635707 | -70.382152 | 1713.32 | -1797.02 |
| 5 | GUIDE | 1201541752 | 7.37 | 3995 | -0.124 | -0.007 | 0.062 | 0.096 | 85.373891 | -70.033762 | 976.47 | -733.46 |
| 6 | GUIDE | 1201542672 | 8.20 | 3988 | 0.120 | -0.032 | 0.075 | 0.120 | 84.492488 | -69.957531 | -135.33 | -863.96 |
| 7 | GUIDE | 1201540760 | 8.55 | 3993 | -0.068 | 0.138 | 0.075 | 0.125 | 84.403691 | -70.419249 | 371.18 | -2452.22 |

2.4 Star Slots

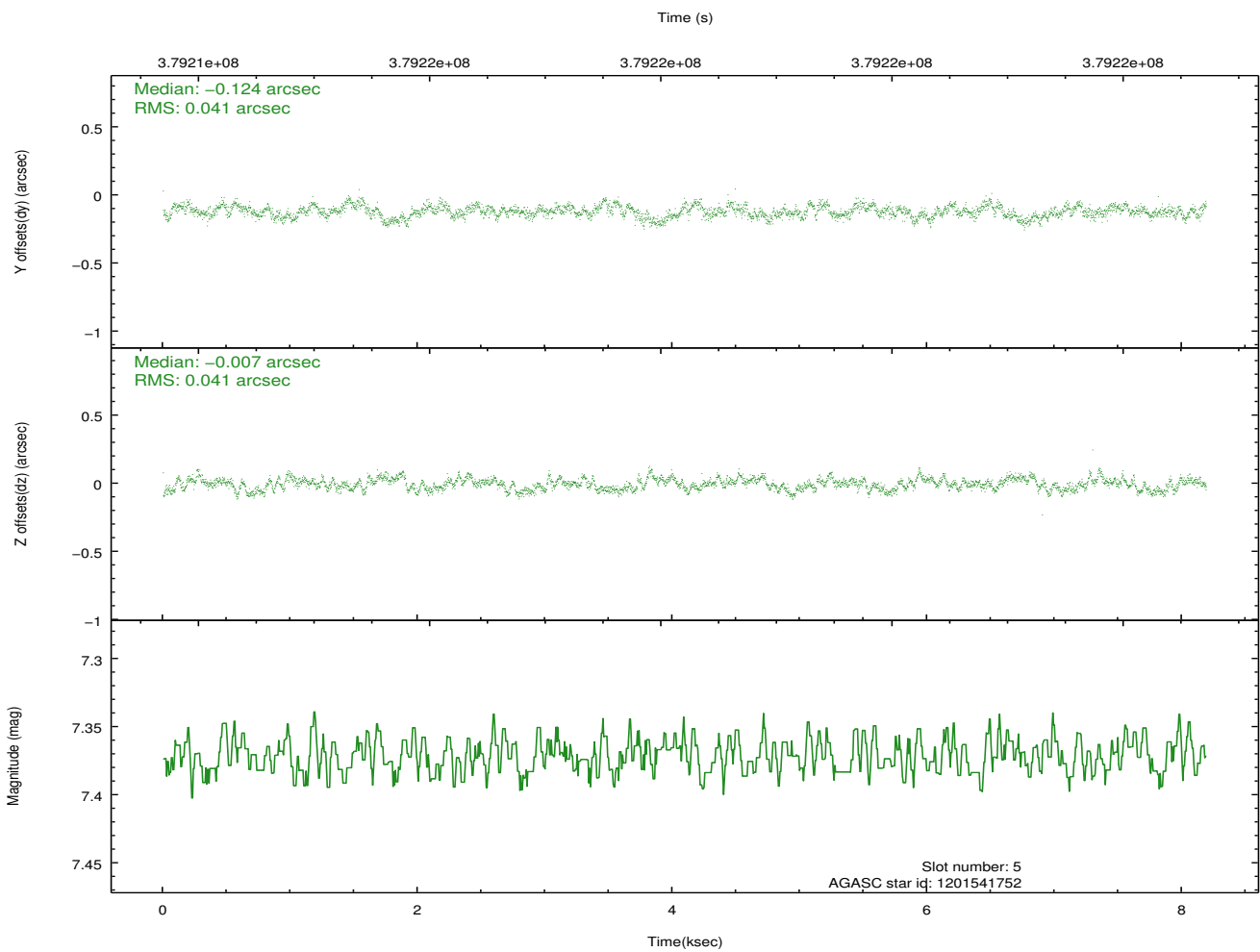
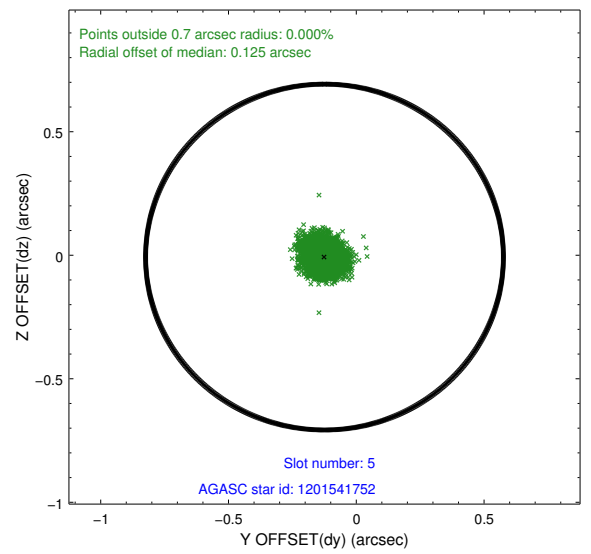
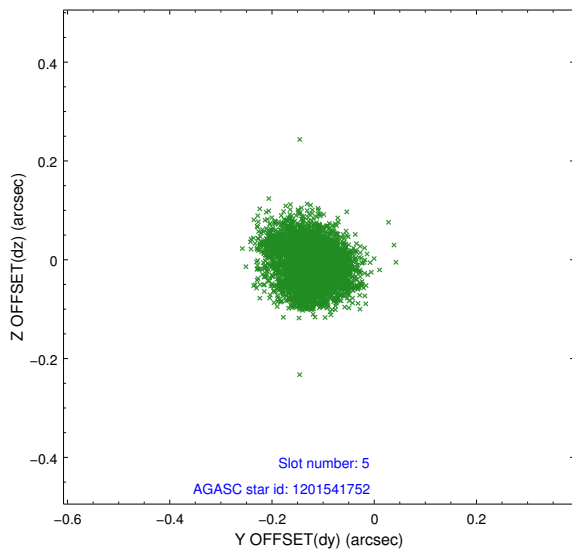
2.4.1 Slot 3



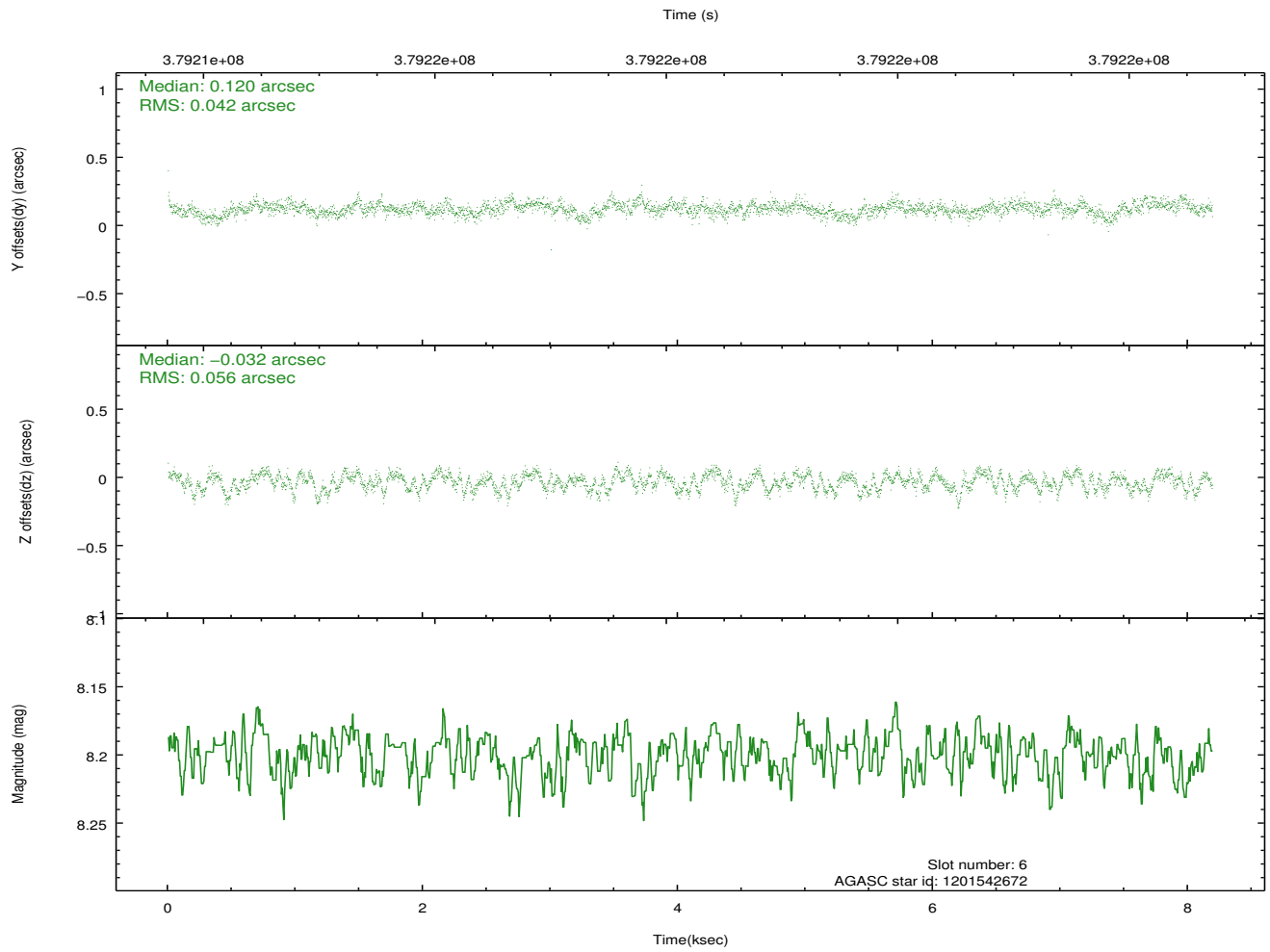
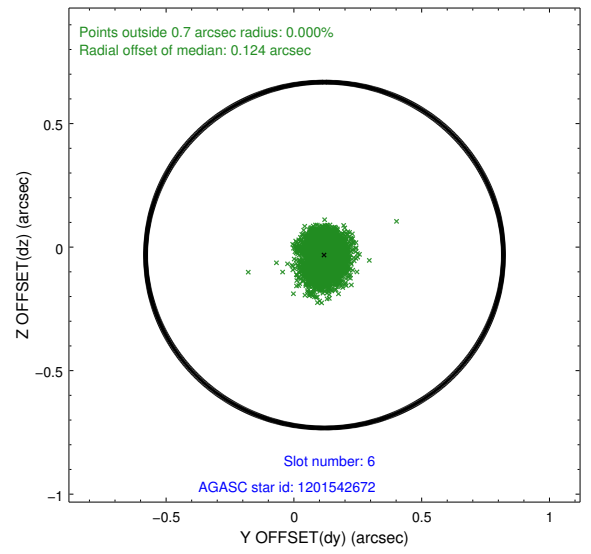
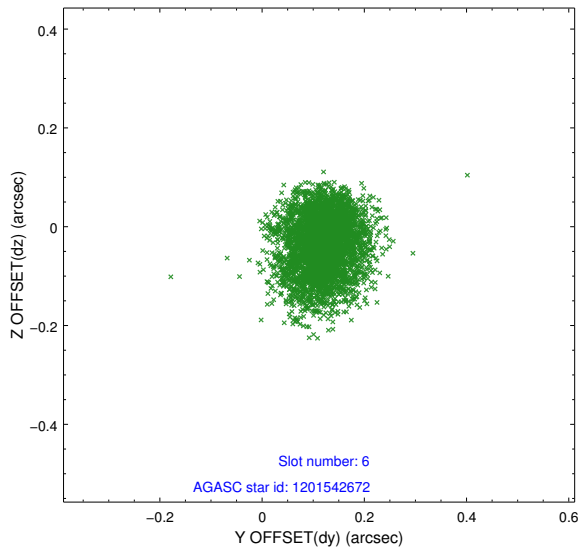
2.4.2 Slot 4



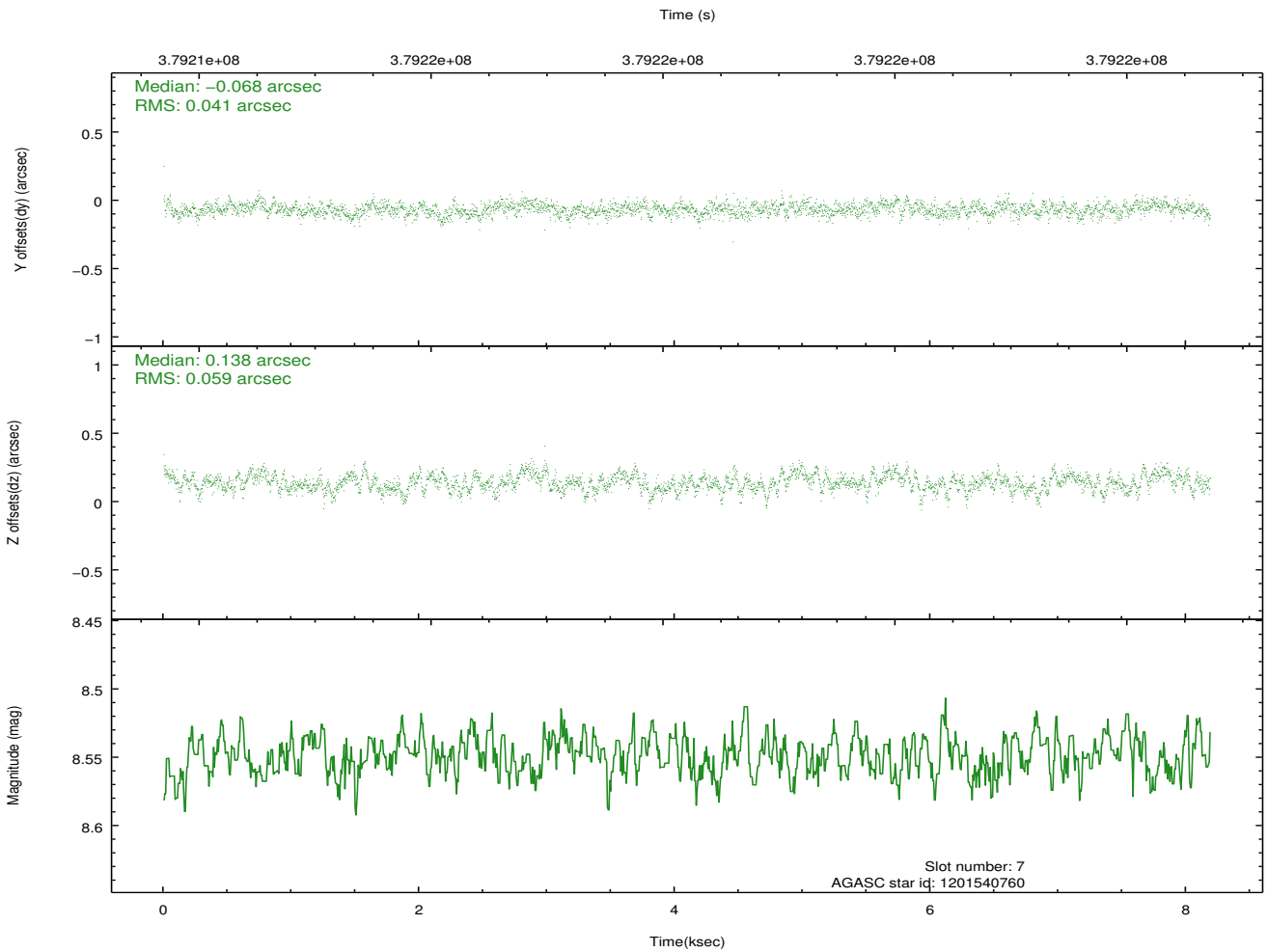
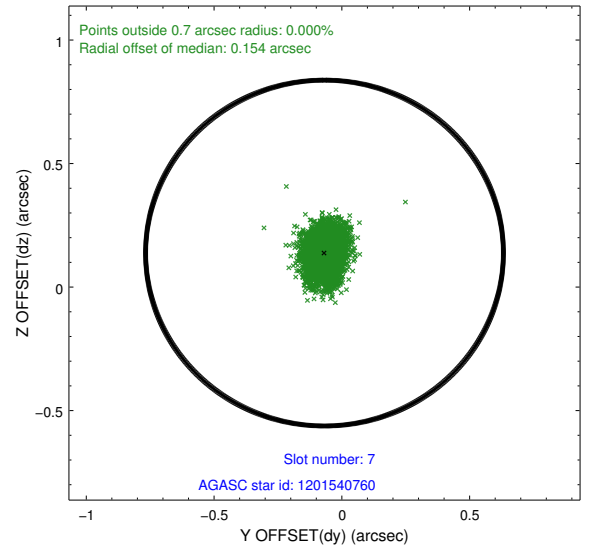
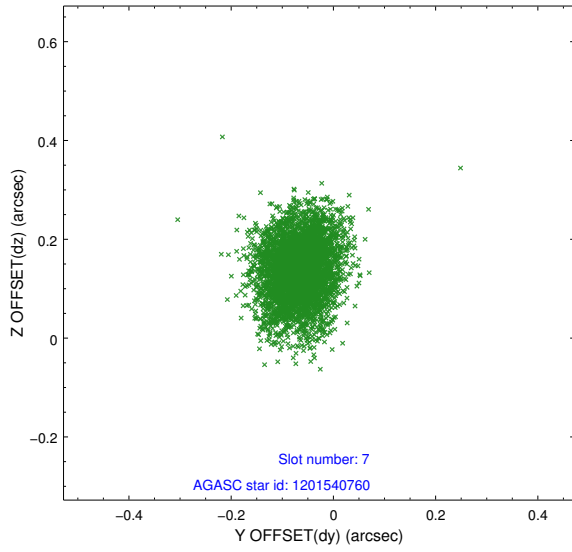
2.4.3 Slot 5



2.4.4 Slot 6

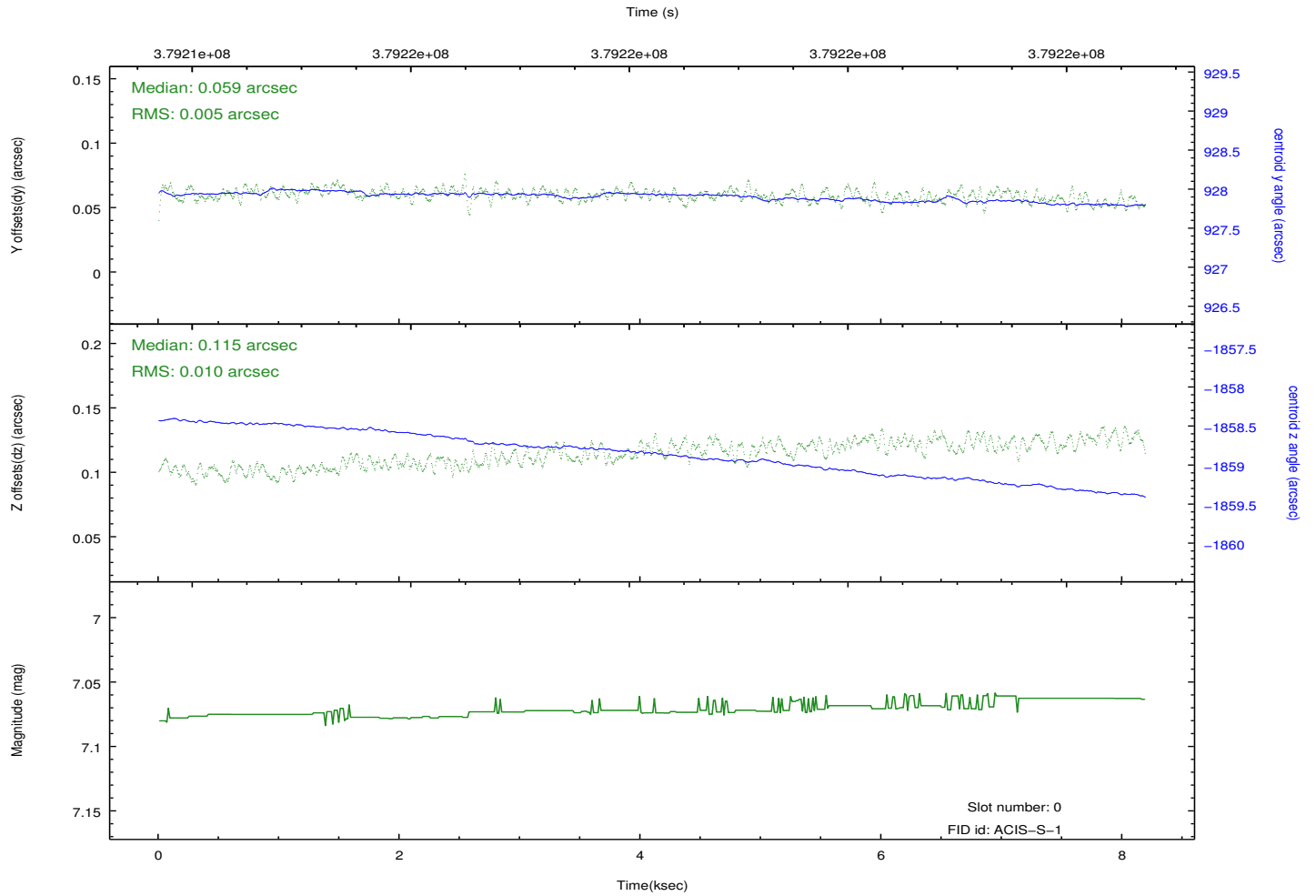
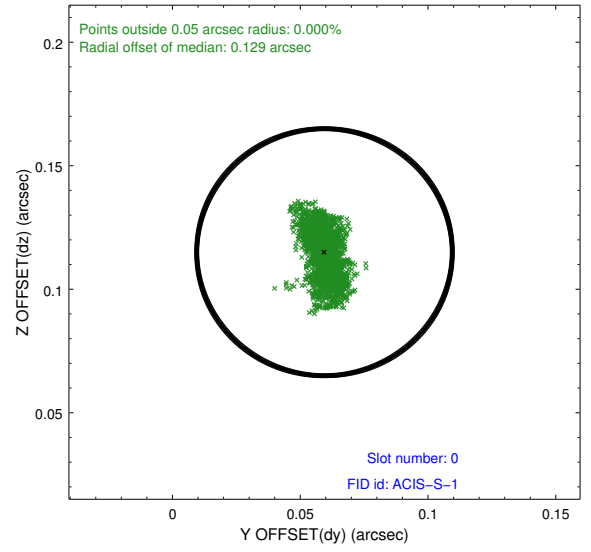
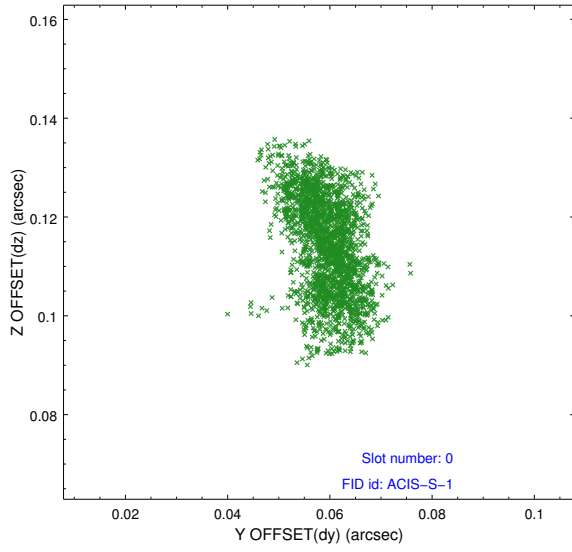


2.4.5 Slot 7

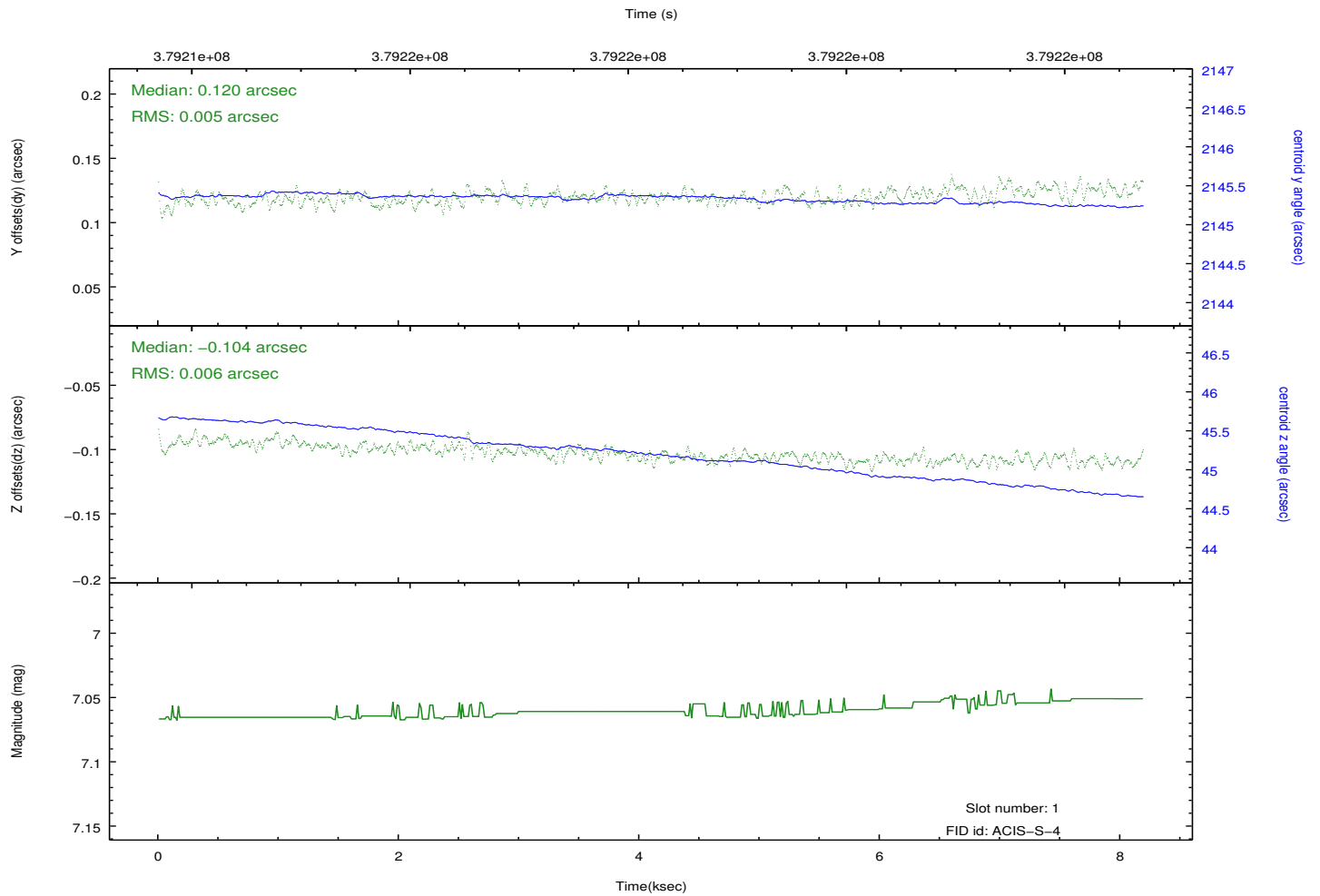
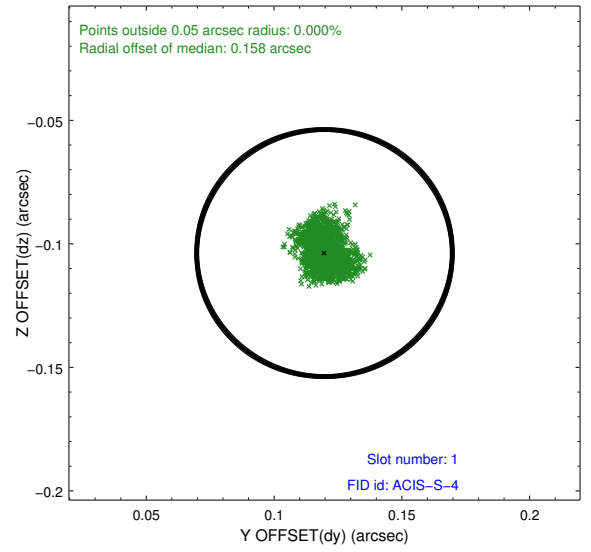
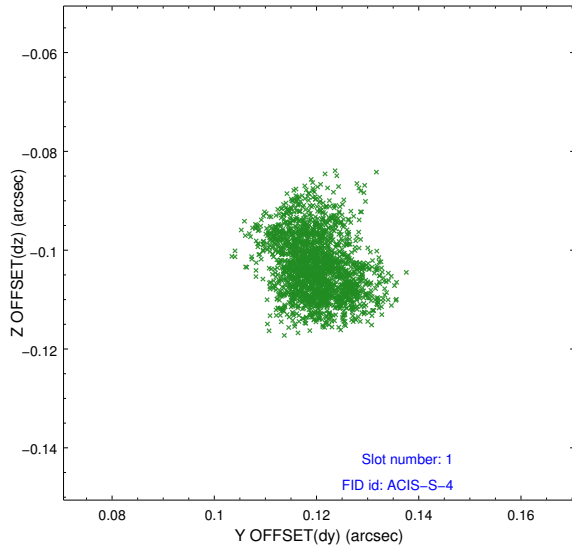


2.5 FID Slots

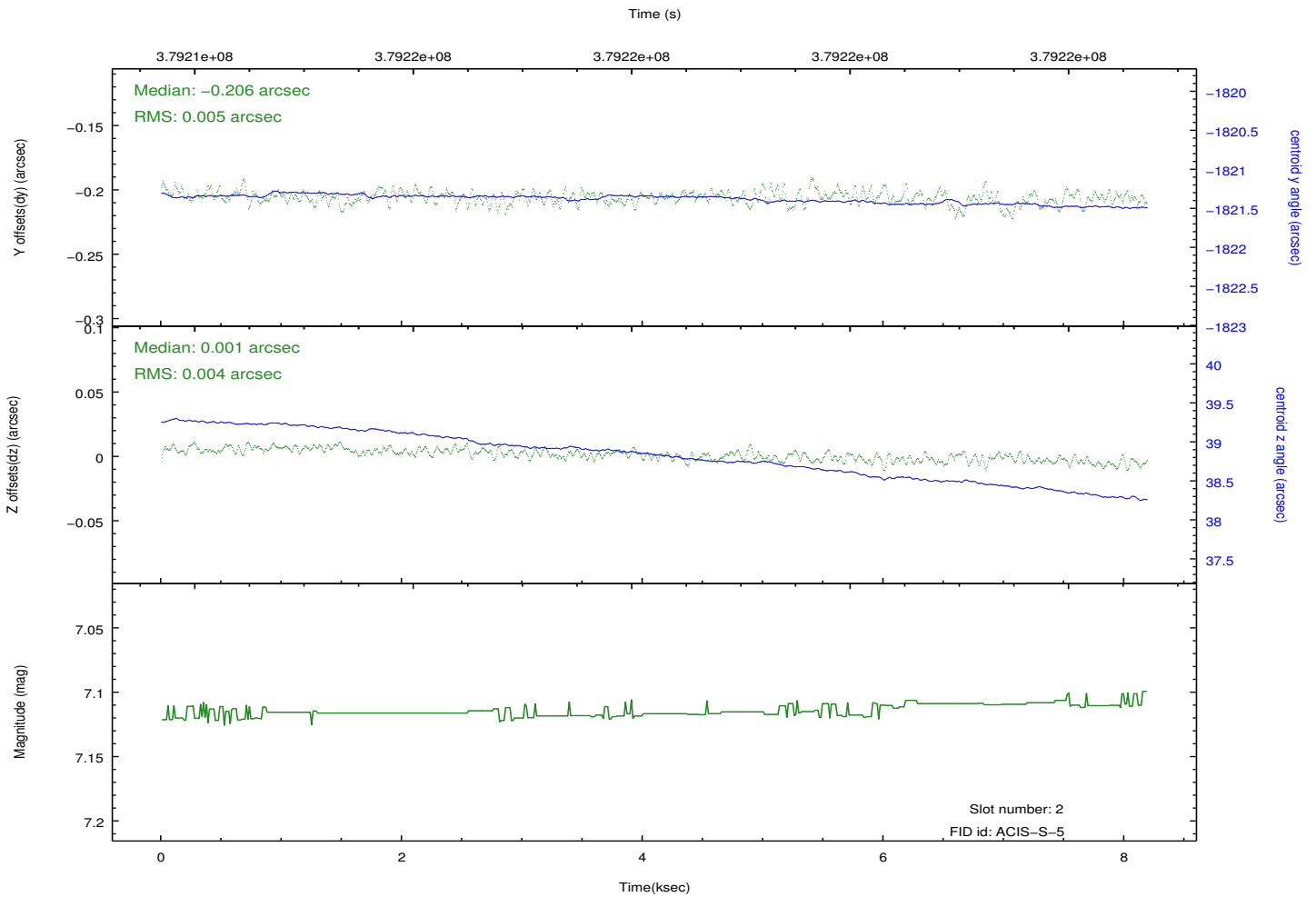
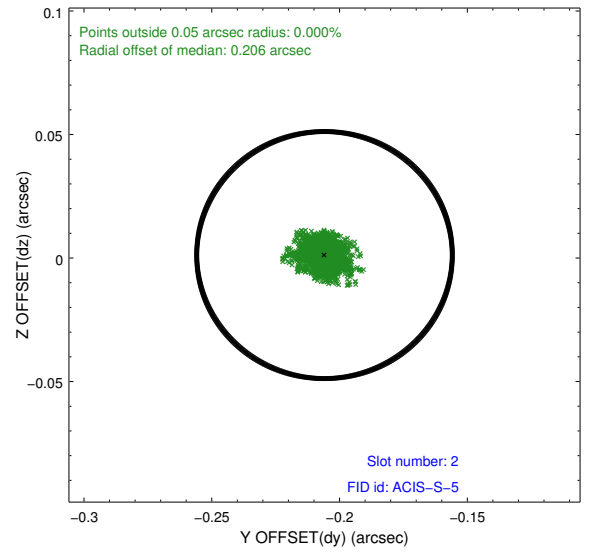
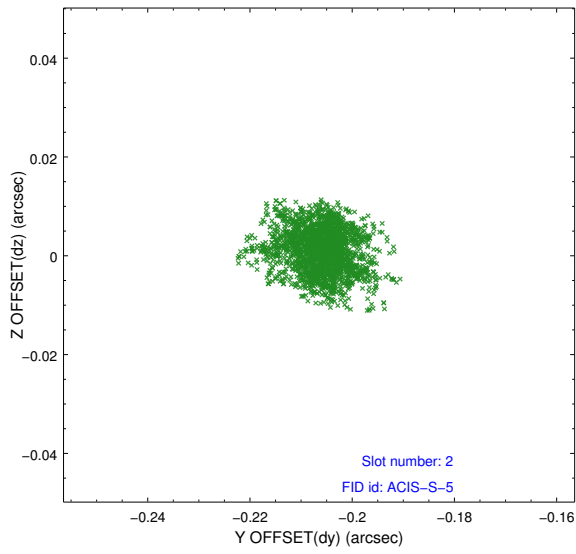
2.5.1 Slot 0



2.5.2 Slot 1

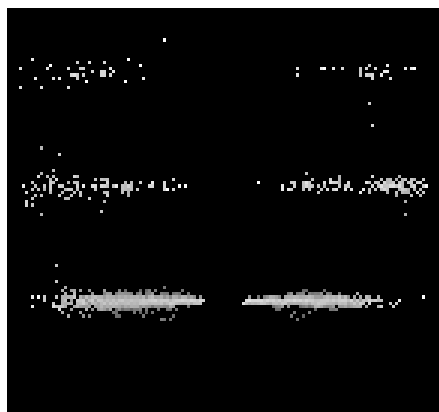


2.5.3 Slot 2

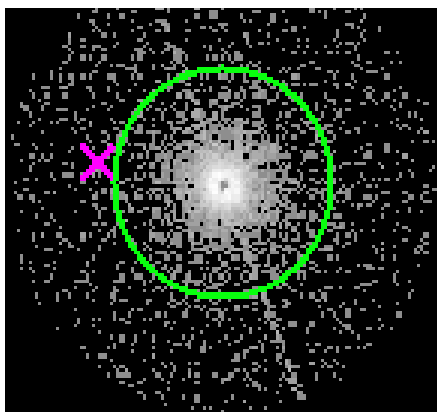


3 Gratings

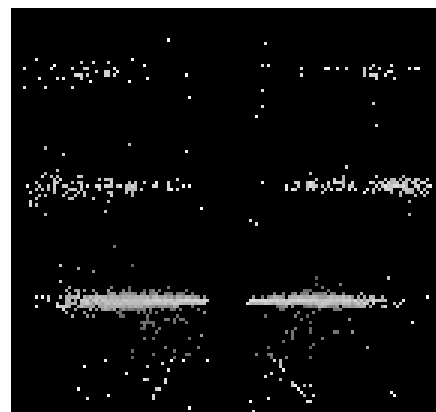
3.1 HEG Arm



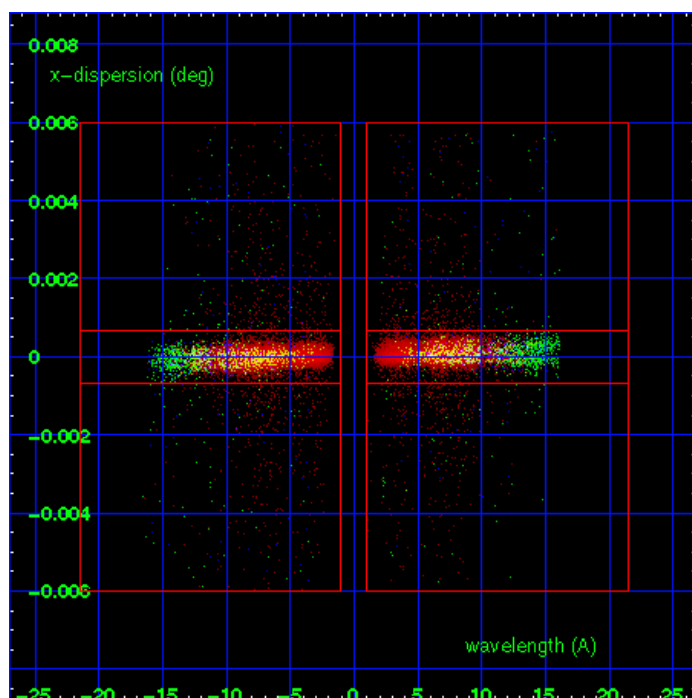
HEG Order Sort 123



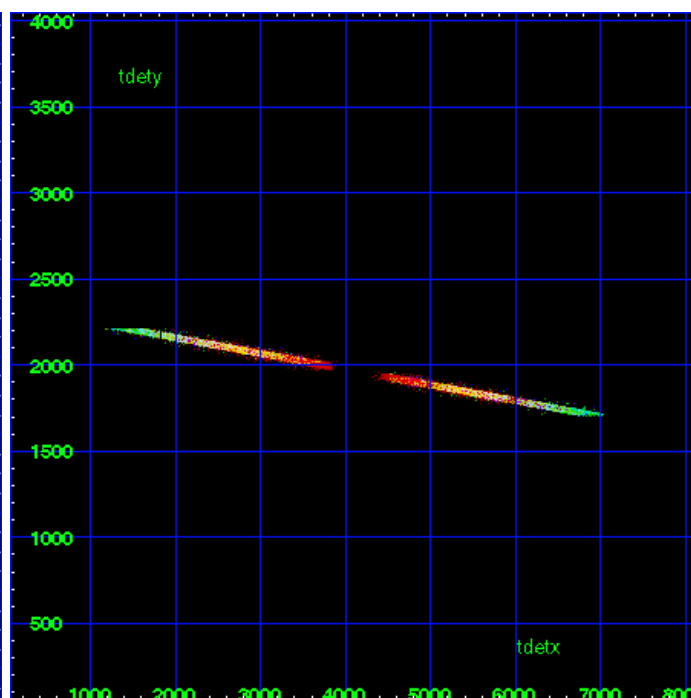
HEG Zero Order



HEG Order Sort ALL

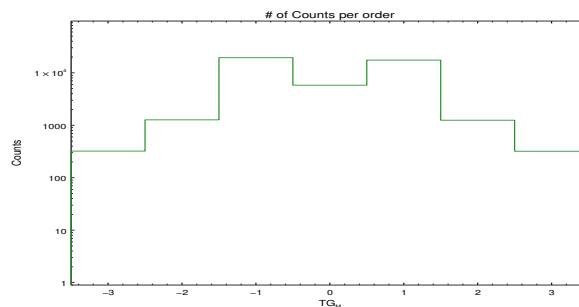


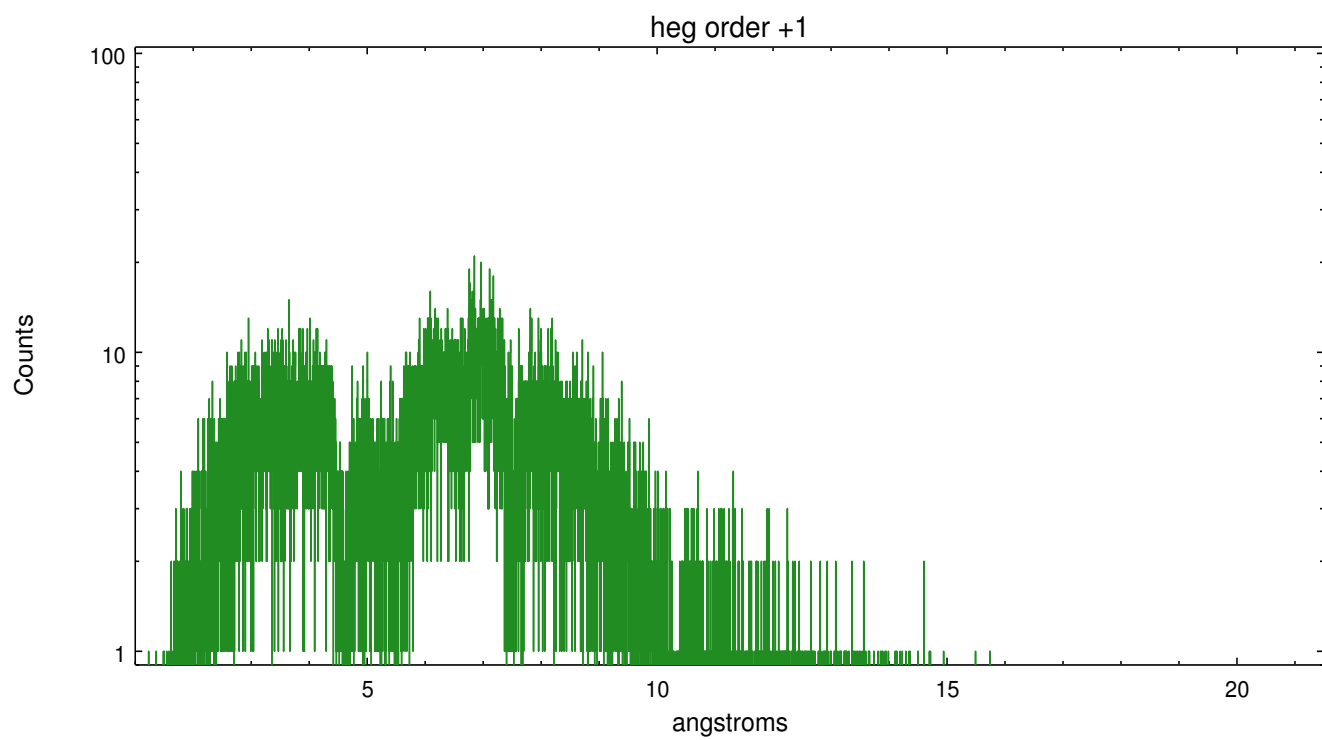
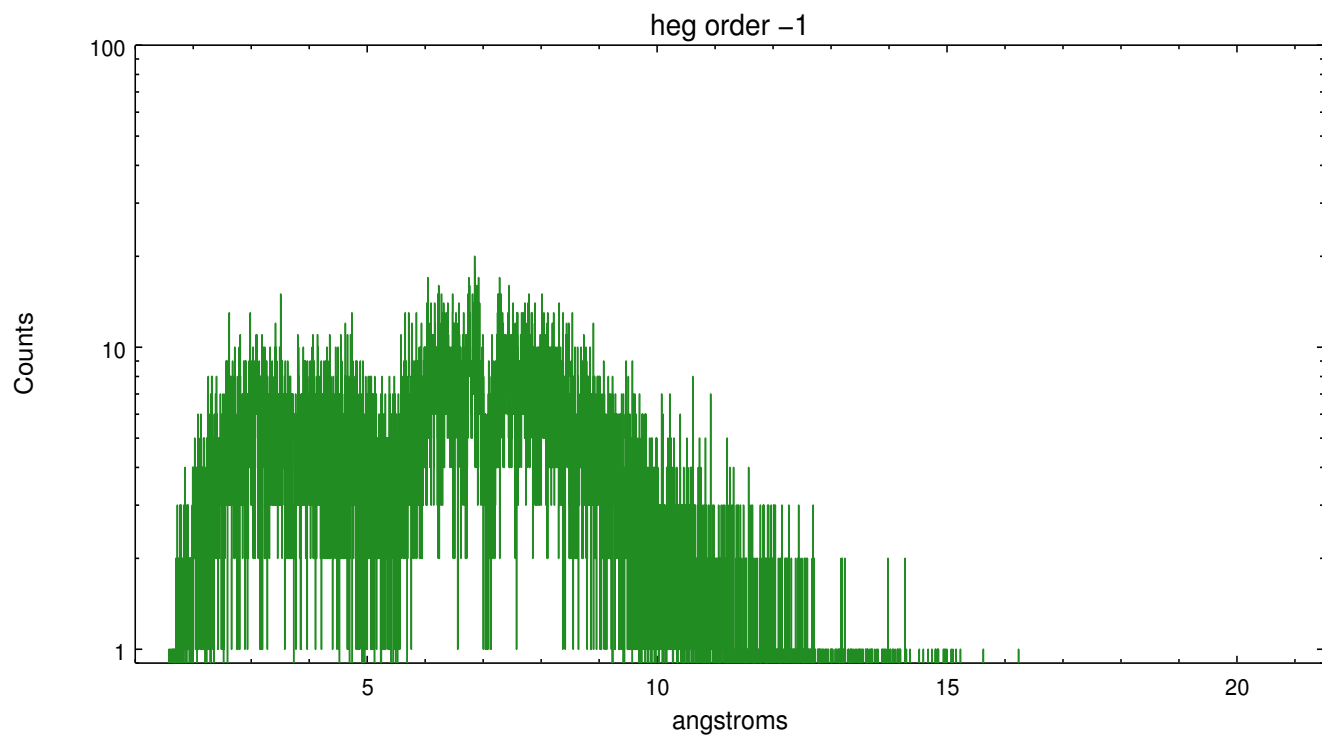
Spot Image HEG



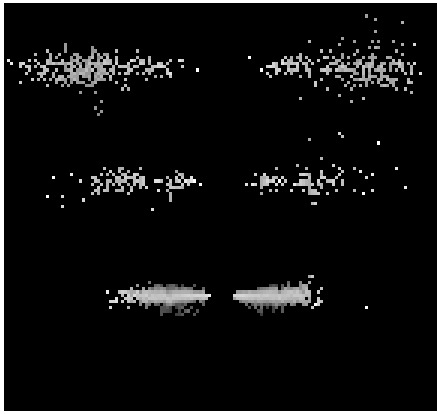
Full Detector HEG

| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 322 | 1268 | 19400 | 5809 | 17470 | 1249 | 320 |

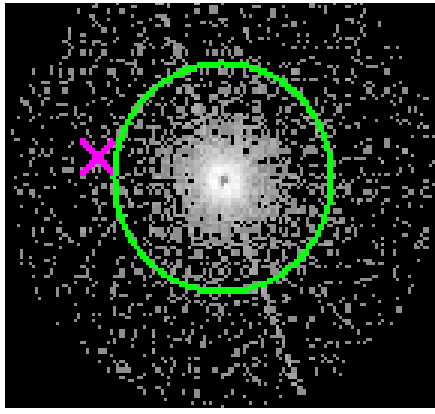




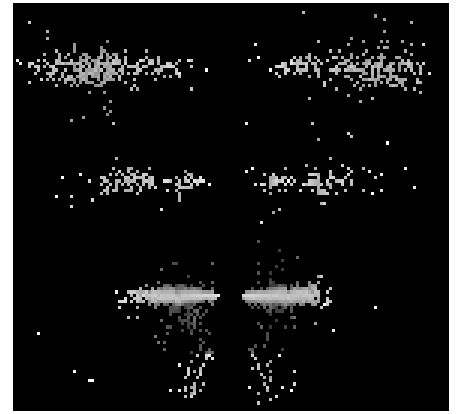
3.2 MEG Arm



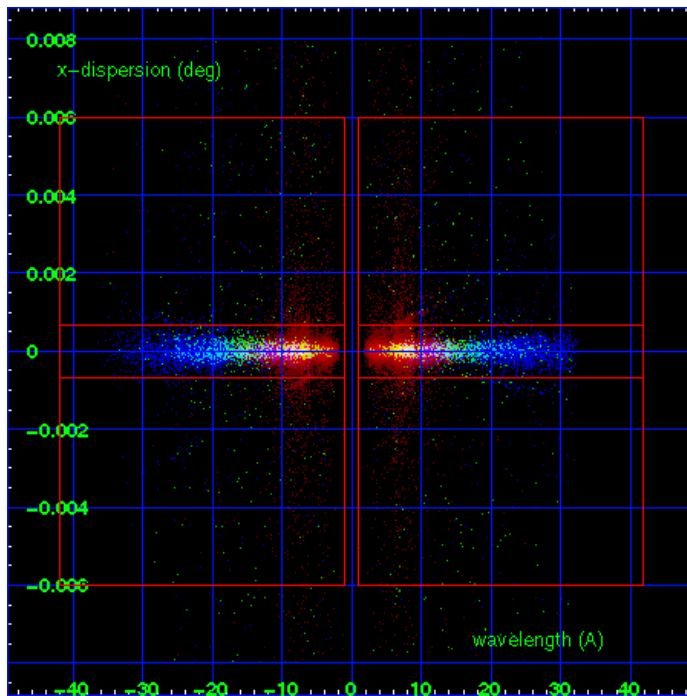
MEG Order Sort 123



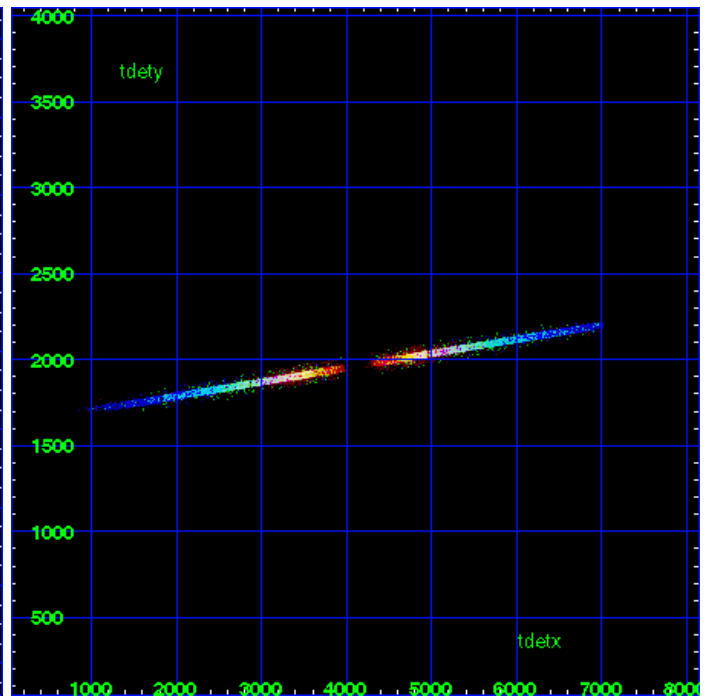
MEG Zero Order



MEG Order Sort ALL

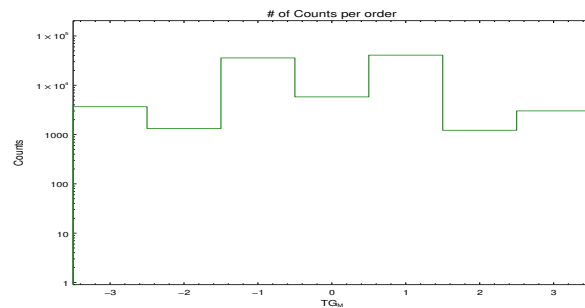


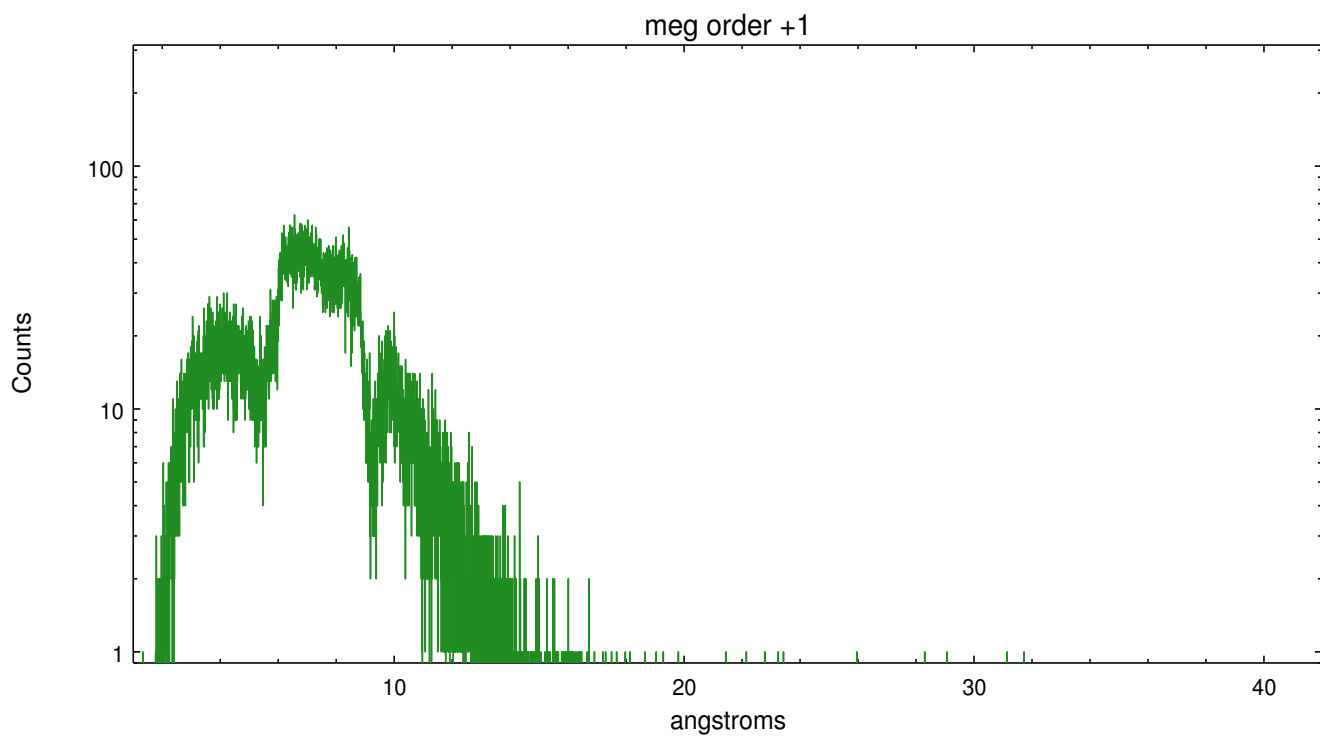
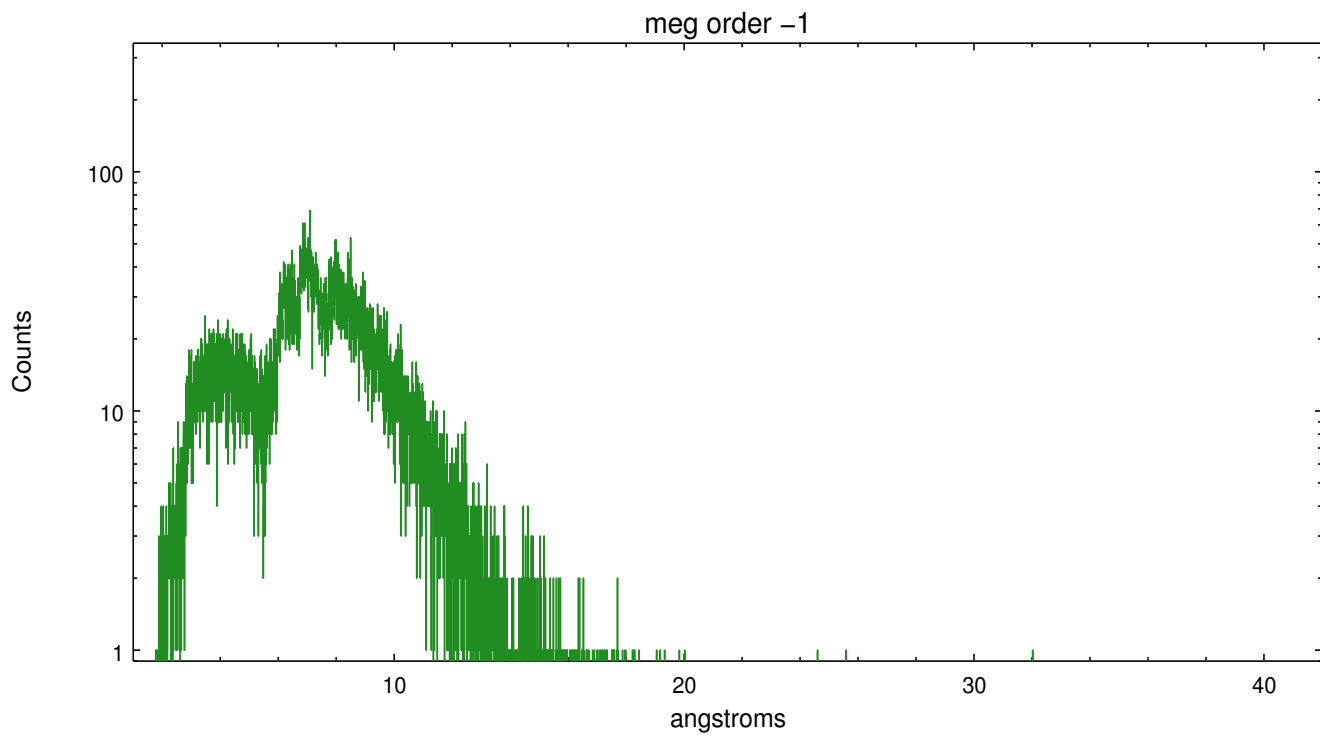
Spot Image MEG



Full Detector MEG

| | order -3 | order -2 | order -1 | order 0 | order 1 | order 2 | order 3 |
|--------|-------------|-------------|-------------|------------|------------|------------|------------|
| Events | 3667 | 1332 | 35859 | 5809 | 40803 | 1220 | 3020 |





A Summary

A.1 Status

| | |
|----------------------------|-----------------|
| V&V Scientist | Joy Nichols |
| V&V Date (YYYY-MM-DD) | 2012.06.21 |
| V&V Edition | 1 |
| V&V Disposition and Status | OK |
| V&V Charge Time | 8.1854999426603 |

A.2 Comments

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=4130.98, y=4090.24) 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 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 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.