MIT
Center for Space Research

Chandra X-Ray Center

Technical Note
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From: David Huenemoerder
Subject: Compensation for LETG/ACIS-S Rotation Residuals in Pipeline Processing

The LETG/ACIS-S spectrum has a residual rotation of ~ 0.08 deg of as-yet unknown origin (software bug, or calibration). In lieu of an *a priori* fix, we can adjust the spectral extraction regions in `tgextract` to compensate.

One solution is to change the minimum and maximum source region boundaries from the default values of $\pm 1.33 \times 10^{-3}$ degrees to $\pm 2.00 \times 10^{-3}$ degrees:

```
pset tgextract min_tg_d=-2.00e-3
pset tgextract max_tg_d=2.00e-3
```

(see the `tgextract` ahelp file for details). This will prevent significant truncation of the cross-dispersion LSF at the largest diffraction angles.

The figures show an observation of 3C273 (`ObsID 1198`, `DATE-OBS` 2000-01-09) events in grating coordinates with the default and revised bounding regions. (Data were processed with `ASCDSVER`, CIAO 3.1 Thursday, April 29, 2004.)

I propose that until we have a calibration and/or software solution for secondary grating/detector combinations, that we provide this *ad hoc* work-around in the pipelines.

(Note: the rotation is not enough to significantly affect wavelengths.)

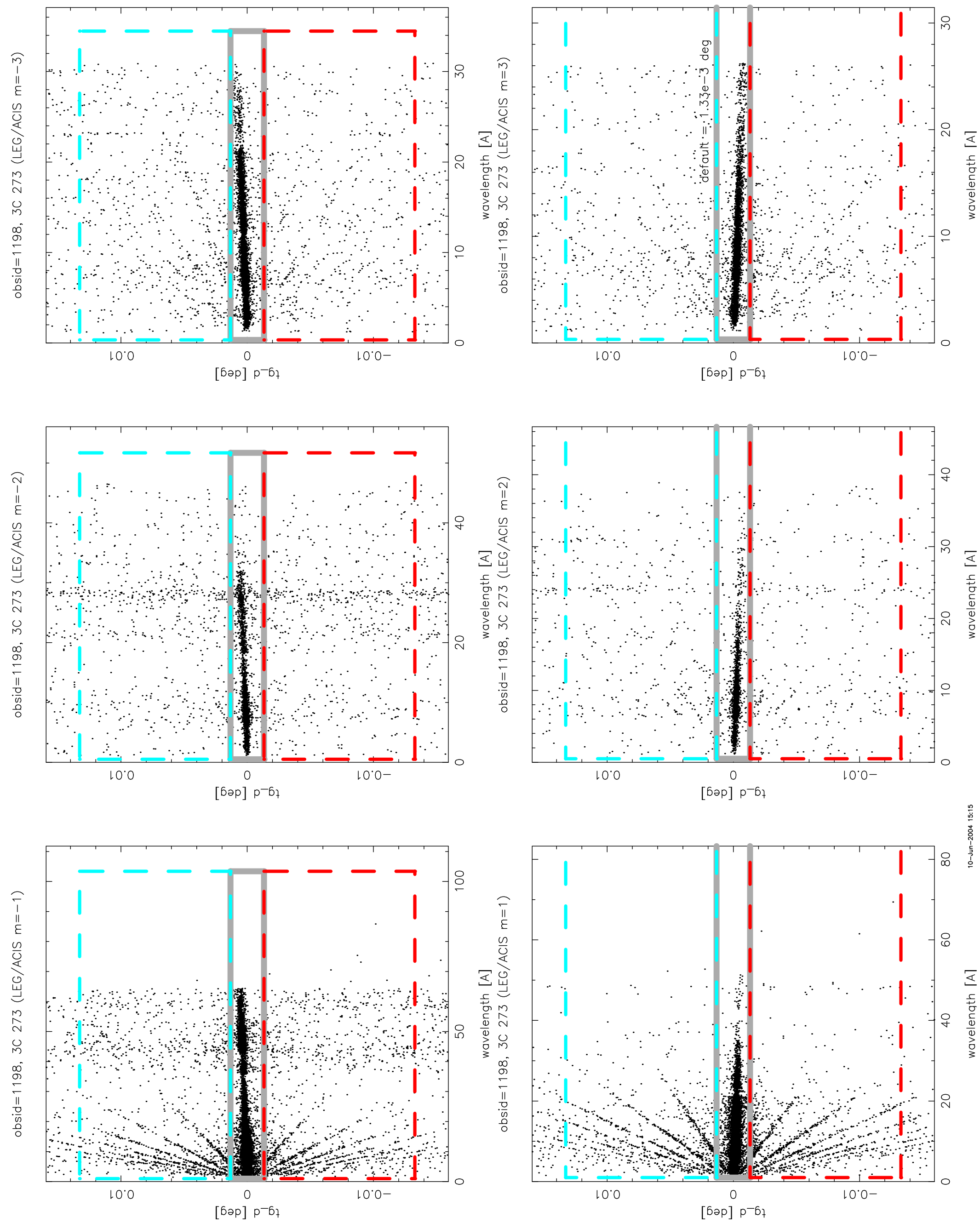

Figure 1:
Events (dots) and regions for default LETG/ACIS-S extraction. The gray border is the source region. The colored dashed lines bound the background regions ("up" and "down"). Orders -1, -2, and -3 are shown from left to right on the top, and 1, 2, and 3 on the bottom.

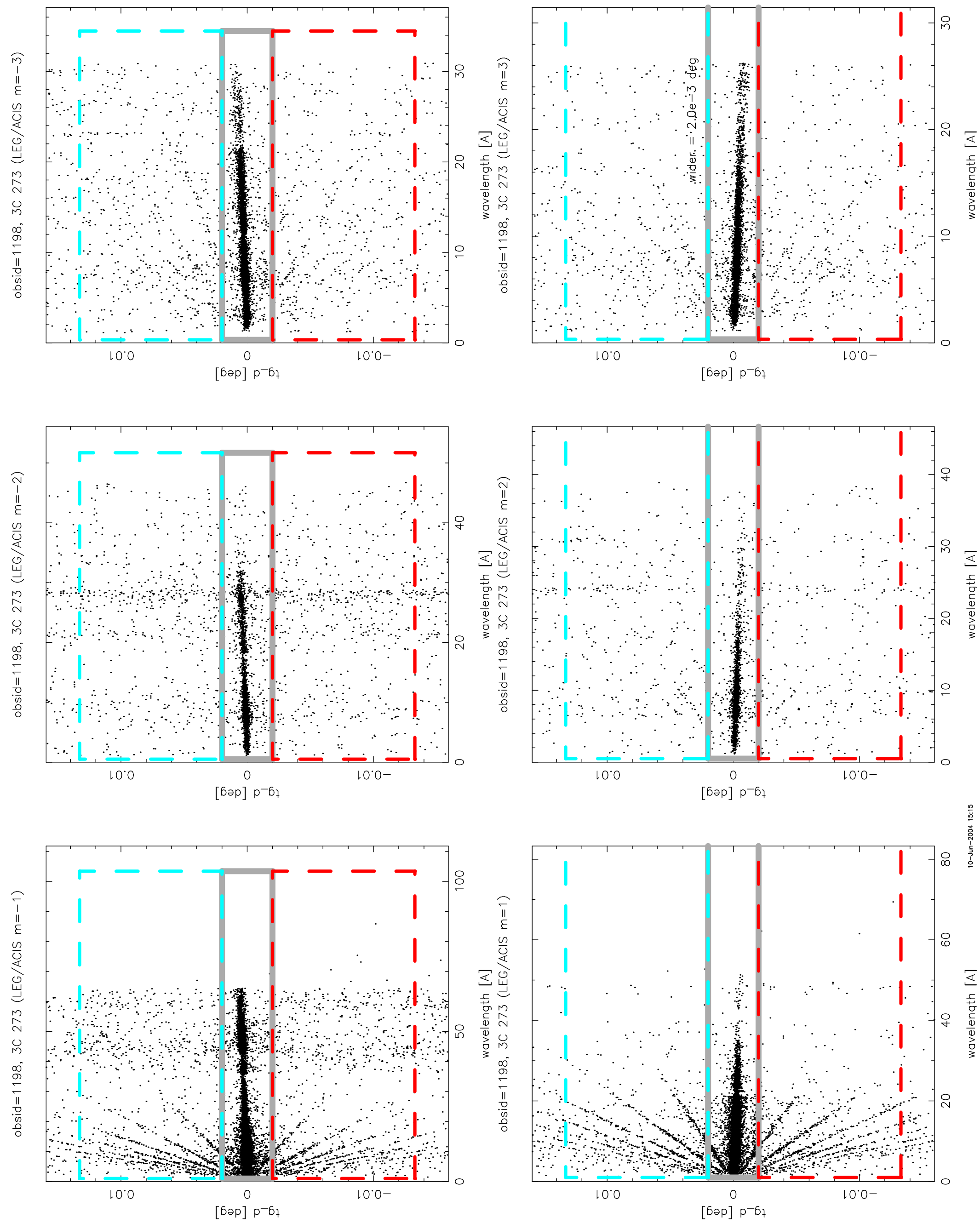

Figure 2:
Events (dots) and regions for compensated LETG/ACIS-S extraction. The gray border is the widened source region.