Chandra Calibration Status

Summary

2. The gratings and mirrors are very well calibrated at this time and there are no time-dependent effects as far as we can tell.

4. Most activities in the calibration group are centered on improving the calibration of the detectors and monitoring the time-dependence response of the detectors.

6. At present we have a single time-independent QE for each ACIS chip and HRC MCP, however, the transmission of the contaminate on ACIS is time-dependent.

8. The spectral response of the ACIS and HRC detectors and the gratings are all time-independent.

10. The ACIS gains are calibrated every 3 months and the HRC gains are calibrated once per year.

12. There are two sets of trap maps for each ACIS FI chip (one set for the first 4 years and one set for the second 4 years) and only one set of trap maps for the ACIS BI chips.

ACIS Calibration Status

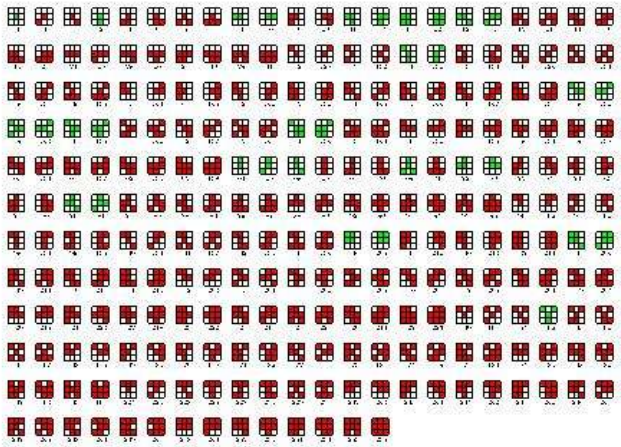
1. TE in Faint or Very Faint Mode – With the release of CALDB 3.3 in Dec. 2007, there are now cti-corrected products for all 10 chips at T=-120 C. Uncertainties in the gain are less than 0.3% and uncertainties in the FWHM are less than 20eV at most energies and chip locations.

3. Graded Mode – These data cannot be cti-corrected, but recent work has shown that accurate cti-corrections can be calculated based on the flight grade of the events.

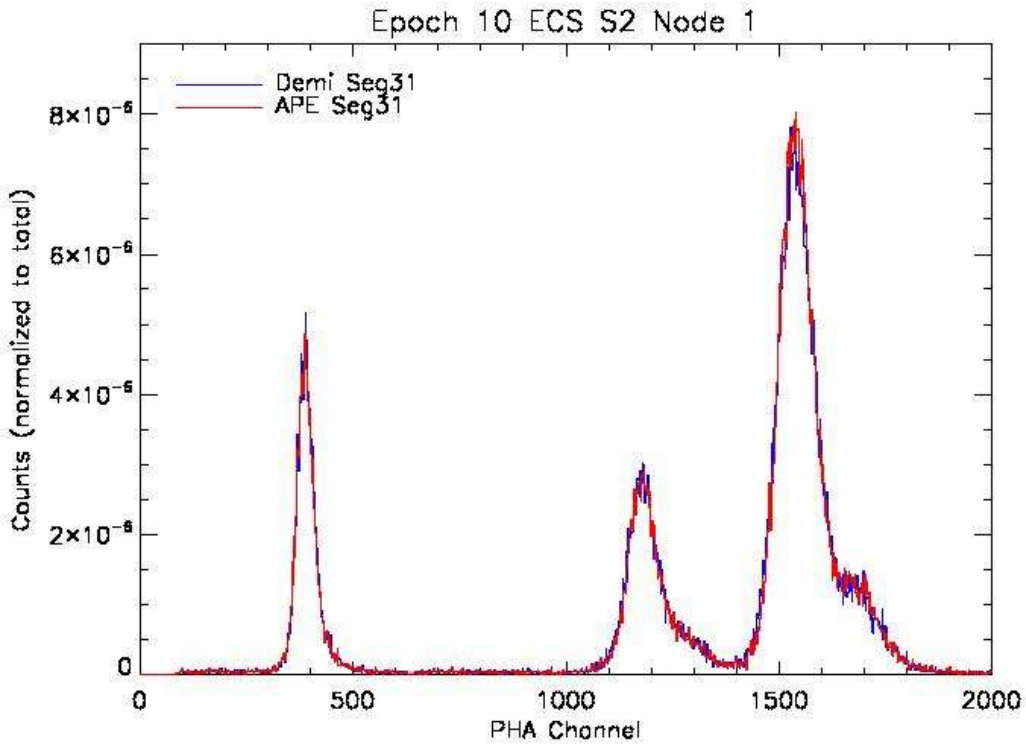
5. CC mode data – Work is underway to further improve data taken in CC mode. This primarily affects gratings data.

7. A set of 10 trap maps have been generated for data taken at a focal plan temperature of T=-110C.

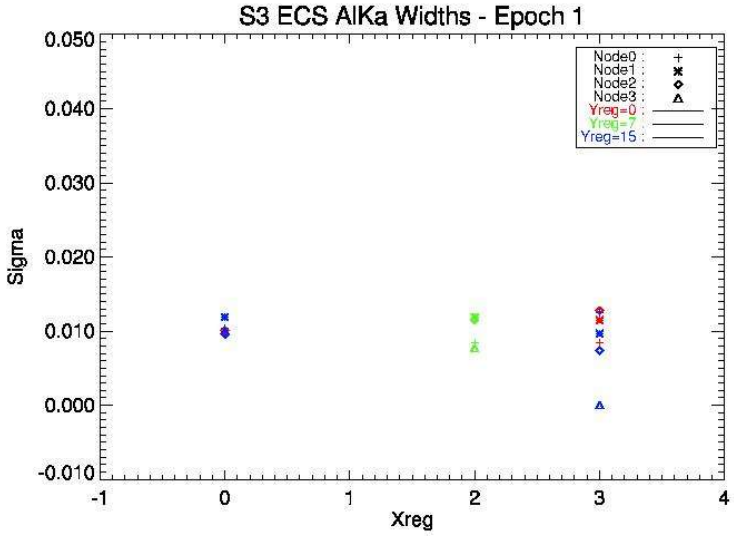
ACIS Flight Grades

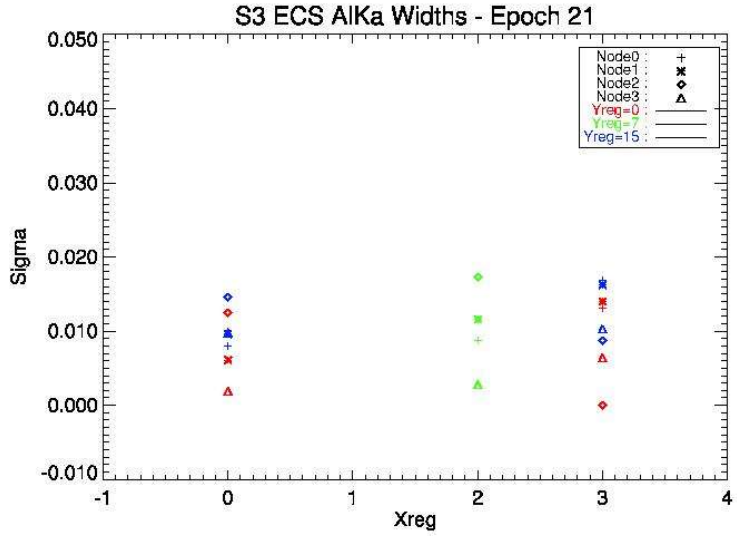


Graded Mode Calibration

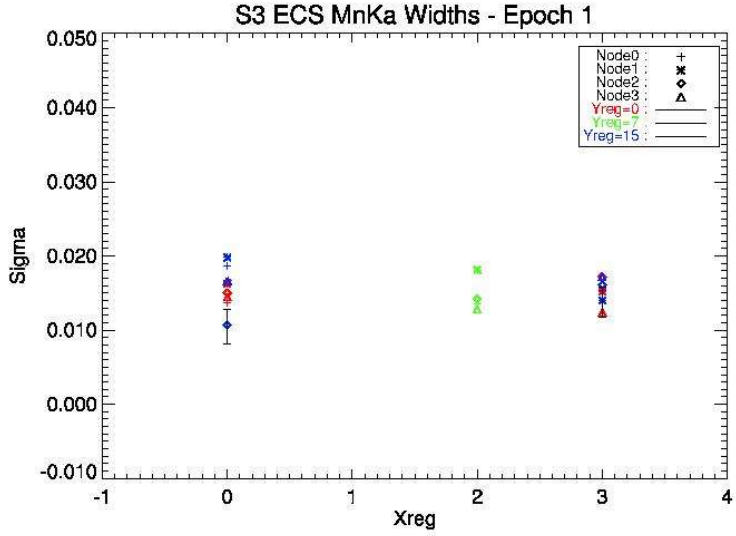


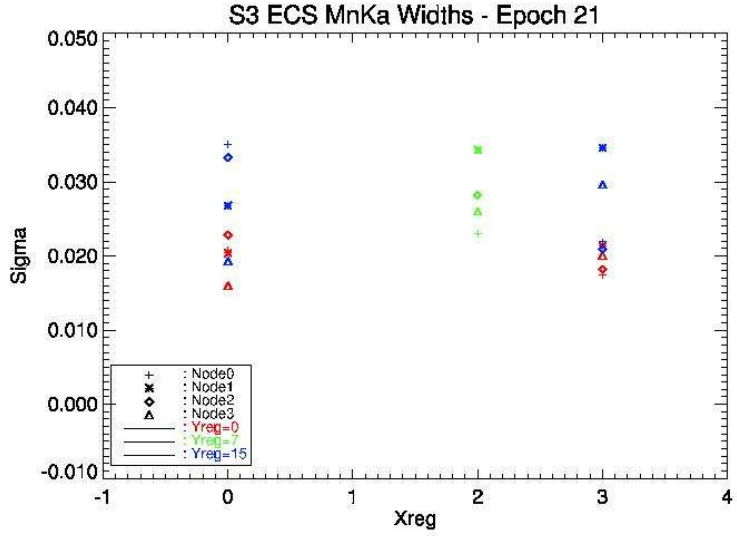
Line width vs. time at Al-Ka





Line width vs. time at Mn-Ka





HRC Calibration Status

1. HRC-S timing mode – uncertainties in absolute times are better than 30 us.

3. The present uncertainties in the HRC-I and HRC-S effective areas are approximately 7%

5. A set gain correction tables for the HRC-I (one for each year) was released in CALDB 3.3 in Dec., 2006.

7. Work is underway to develop higher spatial resolution gain corrections tables for the HRC-S (one for each year). This will improve background filtering.

9. An updated HRC-S QE with corrections near the O-K edge is scheduled for release in CALDB 3.4 in May, 2007.

11. Most of the recent work on improving the QE of the HRC detectors has concentrated on the QE near and below the C-K edge.

13. Work continues on correcting the spatial non-linearity of the HRC detectors which affects the relative astrometry on the HRC-I and the LETG/HRC-S dispersion relation.

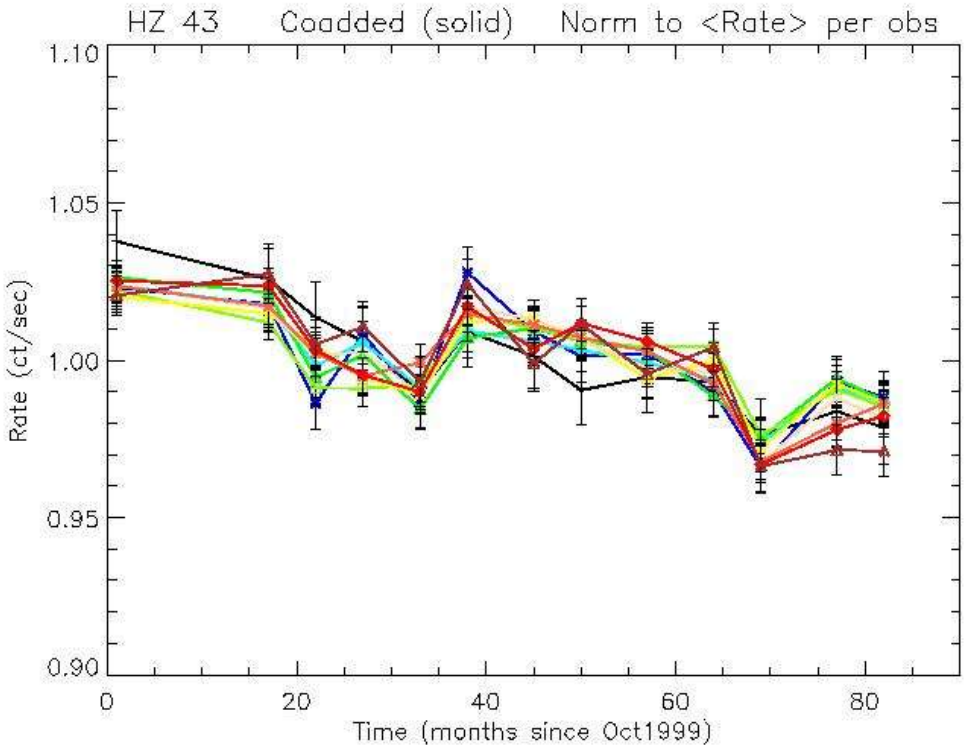
LETG Calibration Status

1. The 1st and higher order transmission efficiencies of the LETG are well calibrated at the present time. Most of the calibration efforts have involved refinements to the HRC-S calibration.

3. Incorporate the non-linearity in the LETG/HRC-S dispersion relation into the line response function.

5. Investigate the cause of the 5% drop in count rate in the LETG/HRC-S observations of HZ43.

LETG/HRC-S Observations of HZ43

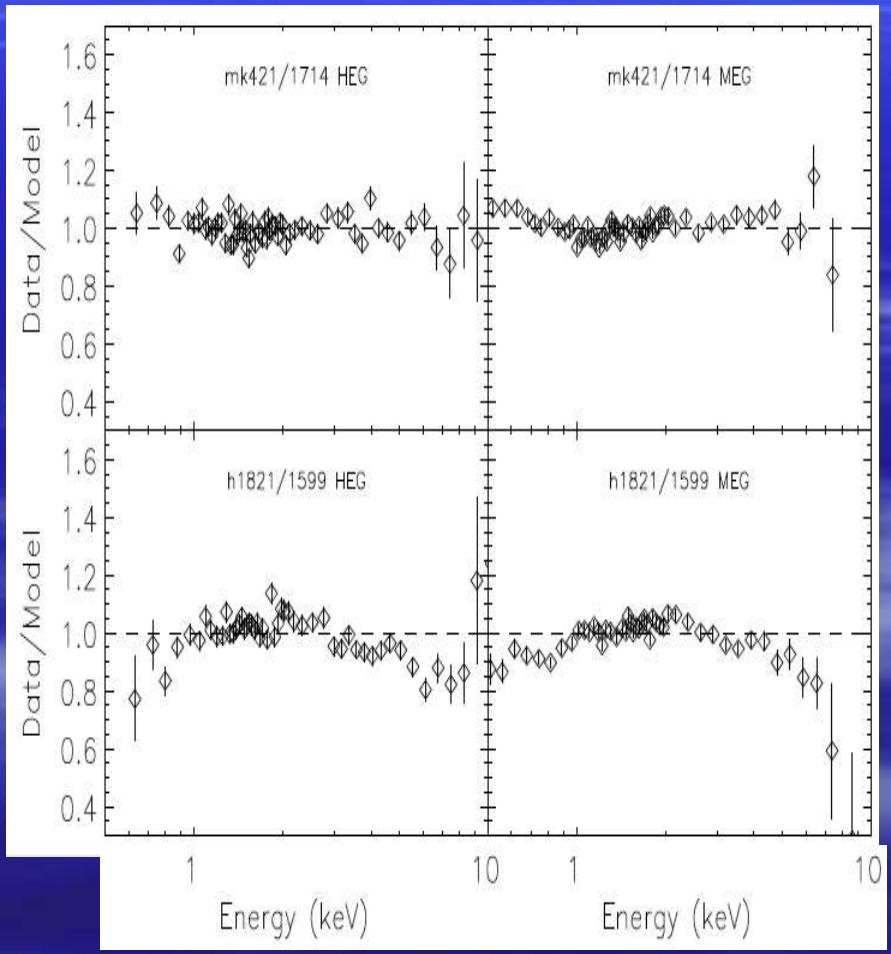


HETG Calibration Status

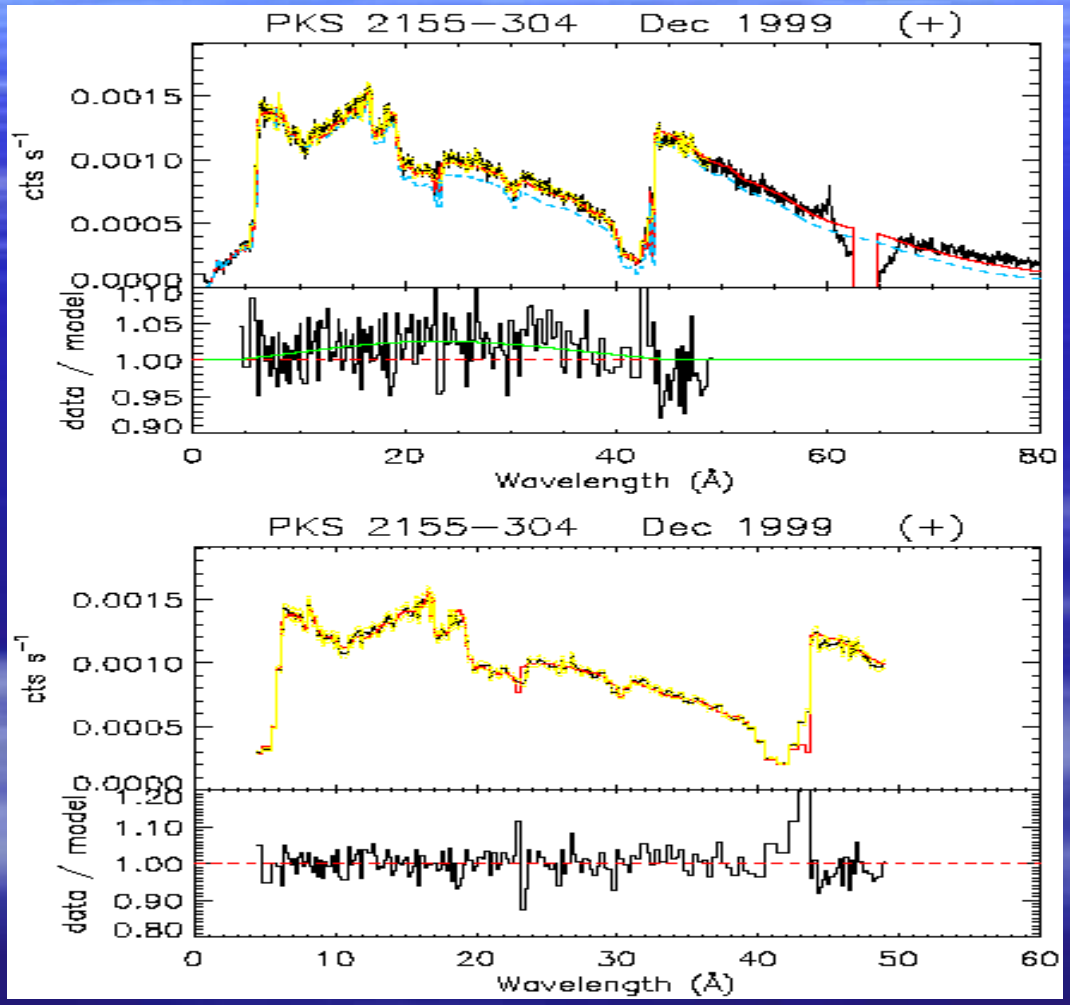
1. 1st order efficiency is reasonably well calibrated.

3. Higher order efficiencies have not been updated since launch.

Residuals are mostly less than 5%



Cross-Calibration Between LETG/HRC-S and HETG/ACIS-S



Residuals are mostly less than 5%except near the C-K edge.

HRMA Calibration Status

- The systematic uncertainties in the absolute HRMA effective are presently 3%.
- Calibrate the PSF for piled-up ACIS images.
- Continue development of a portable Linux version of the SAOsac software package.