Chandra Calibration Status
IACHEC 2010

- Temperature-dependent CTI corrections
- Updates to the ACIS contamination model
- Continuous Clocking (CC) Mode calibration
- Updates to LETG/HRC-S calibration
Temperature-dependent ACIS gain corrections

Focal plane temperature excursions

ACIS Science Observations

- Detector housing heater permanently shutoff
- Exclusive “tail-sun” orientation
- Gain calibration accuracy goal for I-array aimpoint met when T < −119.2°C

- ACIS cooling is less efficient in some Chandra orientations
  - Other spacecraft constraints not always favorable for ACIS
- In 2000, 99% of observations < −119.2°C; in 2007, 68%
- For more on temperature history and other mitigation strategies, see poster C.22 by C. Grant

Catherine Grant (MIT) Sep 21, 2009
Performance of adjusted corrector

Temperature-dependent pulseheight change (% / deg)

<table>
<thead>
<tr>
<th></th>
<th>1.5 keV</th>
<th>6 keV</th>
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<tbody>
<tr>
<td>Standard</td>
<td>−0.7%</td>
<td>−0.4%</td>
</tr>
<tr>
<td>T-dependent</td>
<td>+0.03%</td>
<td>−0.07%</td>
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- Reduces temperature dependence of pulseheight
- >99% of observations now within 0.3% pulseheight calibration goal

Catherine Grant (MIT) —— Sep 21, 2009
External Calibration Source (ECS)

Courtesy of Dan McCammon
Updates to the ACIS contamination Model

Optical depth of the contaminant at the Mn-L and F-K complex on ACIS-S
Revised ACIS Contamination Model – CALDB 4.2

Pre CALDB 4.2

CALDB 4.2
The Coma Cluster

1999

2009
Pre CALDB 4.2

2009
CALDB 4.2
LETG/ACIS-S Observation of Mkn 421

Pre CALDB 4.2

CALDB 4.2
Operating Modes
1. Timed event mode (TE)
2. Continuous Clocking Mode (CC)

Telemetry Formats
1. Very faint (VF) 5 x 5
2. Faint (F) 3x3
3. Graded
ACIS CC Faint Mode Calibration

ACIS Flight Grades
CC Faint Mode Calibration

Comparison of TE and CC Flight Grade Distribution

New SI Mode for CC observations telemeters all flight grades except 24, 107, 127, 214, 223, 248, 251 and 255
HETG/ACIS-S observations of bright sources in CC-G Mode
Features near the Si-K edge in HETG/ACIS-S observations of bright sources in CC-G mode
Recent Updates to the LETG/HRC-S Effective Area - CALDB 4.2.1
Relative adjustments to the LETG higher order efficiencies
Order sorting plot for HETG/ACIS-S spectrum

3 column averaged trap map

Single column trap maps are now being generated for CC-F mode data based on the AL-Ka line in the ECS data.