



ACIS Changes Starting in Cycle 8

- 1) Selection of Optional CCDs
- 2) Revised Energy-to-PH conversion
- 3) VF mode and Higher Background Rates

ACIS Ops Team



1) Specification of Optional CCDs for Cycle 8

- GOs are asked to identify CCDs which are not necessary for their science objective as *optional* CCDs
- These optional CCDs *may* be turned off for an observation for thermal reasons (we expect ~10 observations out of ~730 non-TOO ACIS observations to be affected)
- Observations with 6 CCDs operating at pitch angles less than 60 degrees for durations longer than 50 ks (either in one observation or consecutive observations) may be affected
- GOs still have the option to *require* that 6 CCDs are used in their observation, in that case the CXC will:
 - 1) Attempt to schedule the observation at pitch angles larger than 60 degrees
 - 2) If not, break the observation into pieces with cool attitudes scheduled around the hot attitudes
- The potential exists for an observation which could not be done, 6 CCDs are required, the pitch angle must be less than 60 degrees to satisfy other constraints, and the observation must be uninterrupted.

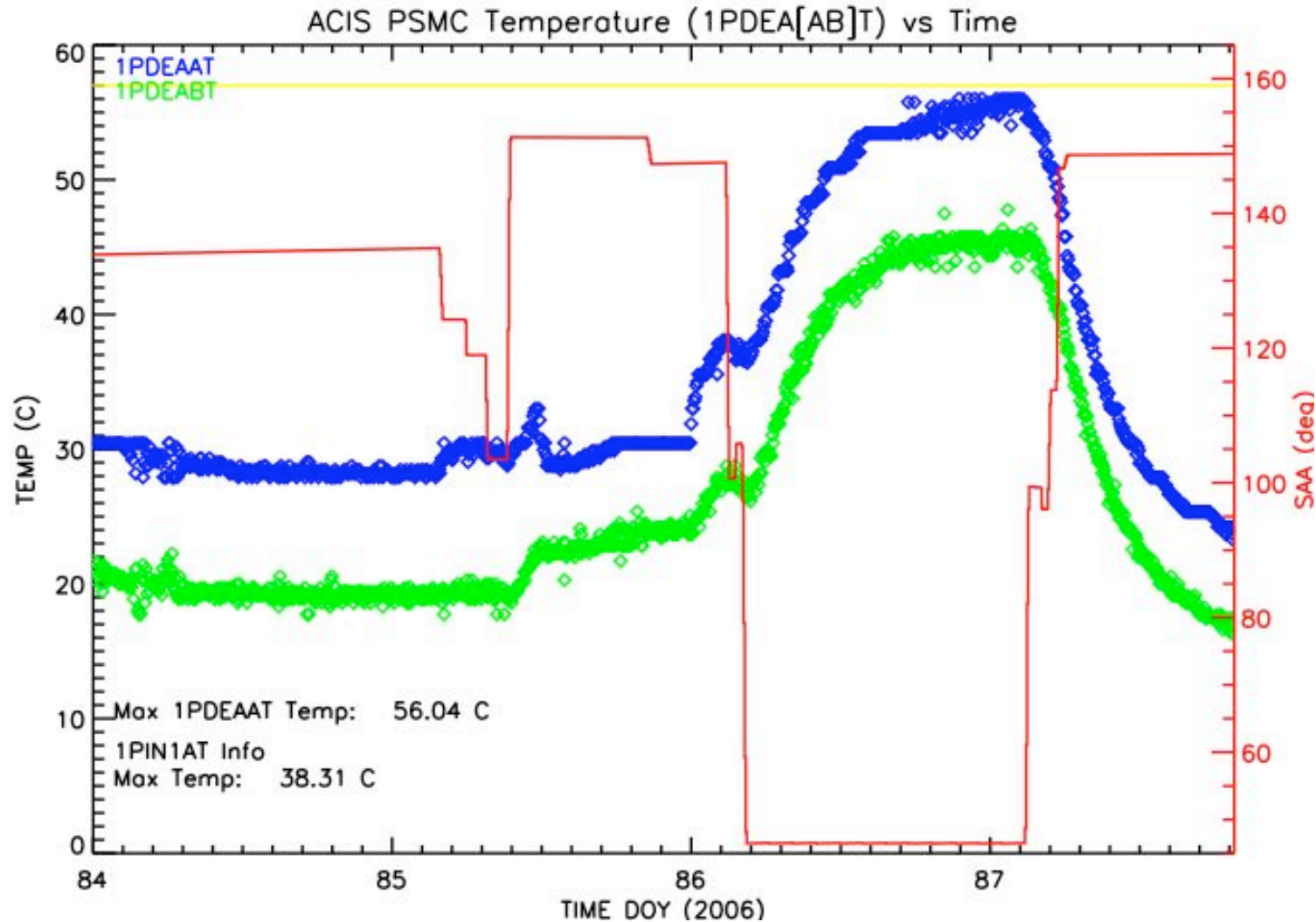


Chandra X-Ray Observatory

CXC

ACIS PSMC Temperatures During March 2006 Comet Observations

DEA Power Supply Side A and B in the Power Supply & Mechanism Controller

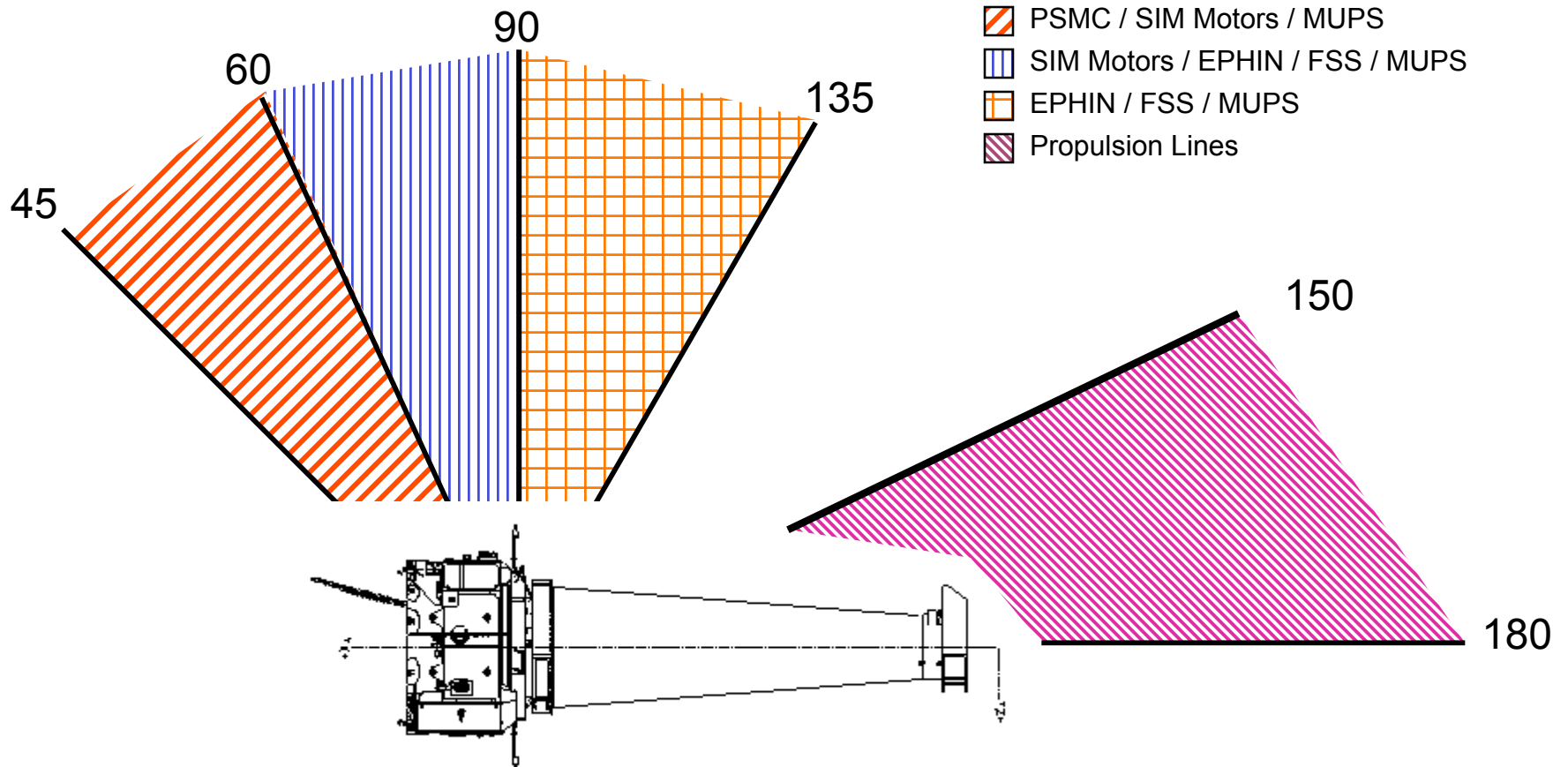




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Constraints on Spacecraft Pitch Angles





2) Revised Energy to PH Conversion

- GOs request an energy filter by specifying a lower energy cutoff and a range, for example: a lower energy cutoff of 0.1 keV and a range of 12.0 keV
 - ACIS OPs must convert this energy into a PH in ADUs to command the instrument
 - Up to this point in the mission, we have been using one conversion for both the FI and BI CCDs
 - Due to CTI effects, the energy that a given PH corresponds to varies across the CCD
 - ACIS will now use lower energy cutoff conversions specific for the BI and FI CCDs, there is no change for the range conversion
- 1) If the lower energy cutoff is less than 0.5 keV, the BI or FI conversion will be used depending on the HRMA aimpoint (BI conversion for an ACIS-S observation, FI conversion for an ACIS-I observation)
 - 2) If the lower energy cutoff is larger than 0.5 keV, CCD-wide spatial windows will be defined to utilize the FI conversion for FI CCDs and the BI conversion for BI CCDs
- GOs specify energy filters as they always have done, the USINT scientists will assist in the creation of CCD-wide windows when necessary

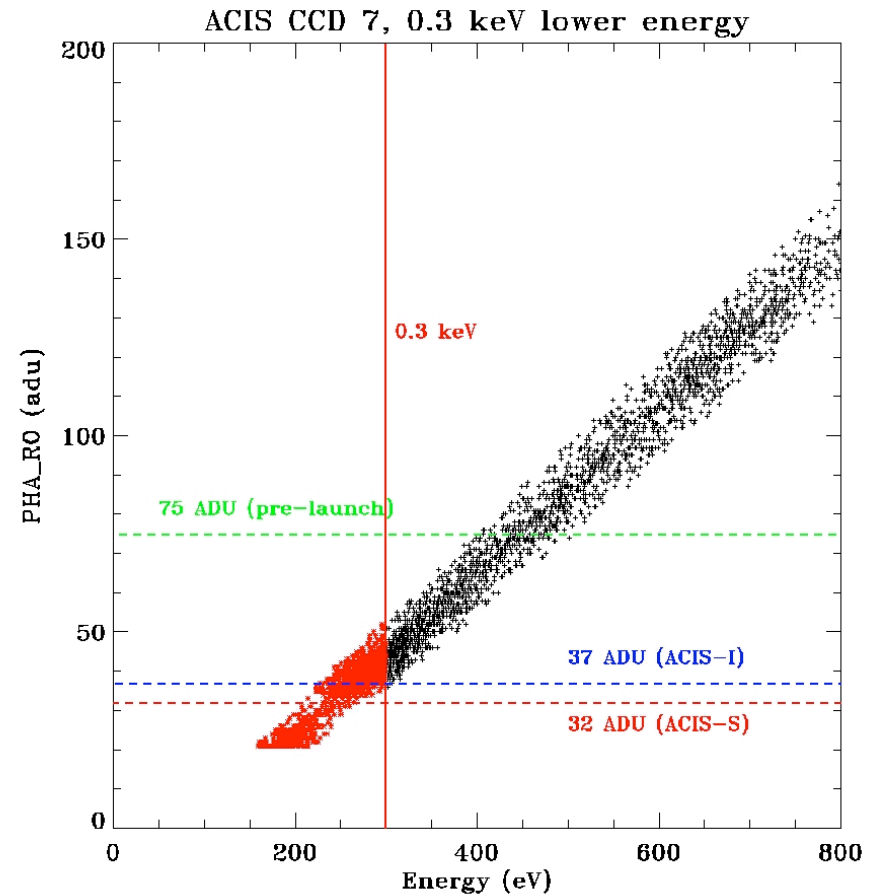
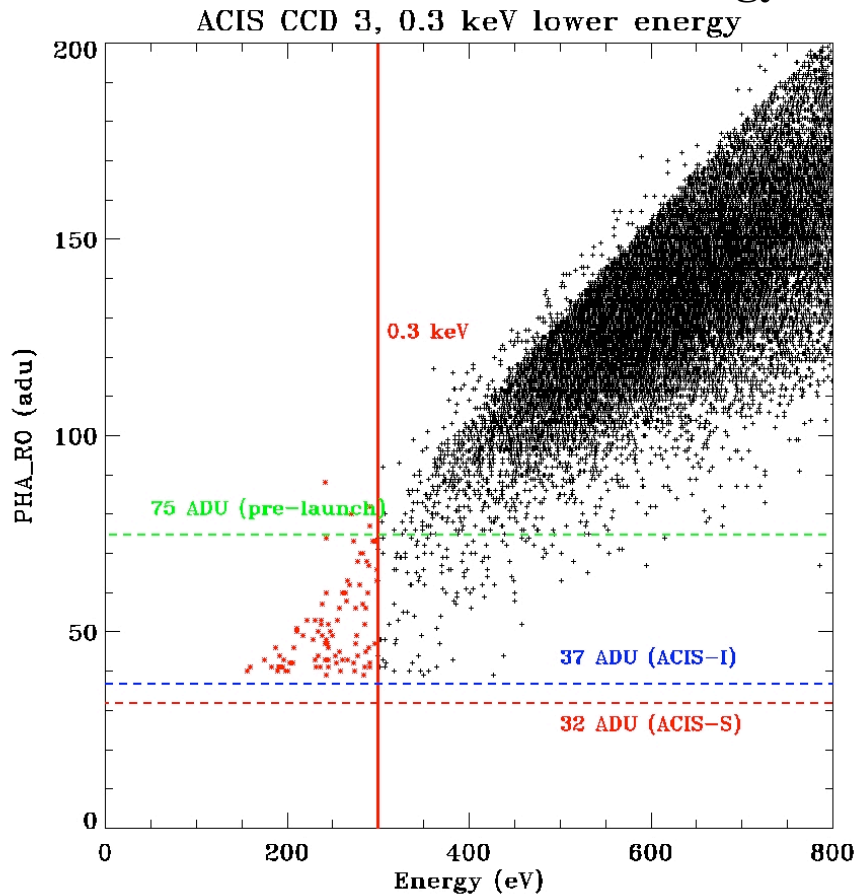


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Comparison of New FI and BI Conversions to Existing Conversion

- Existing conversion rejected some events with the desired energies
- New conversion will err on the side of allowing some events into TLM which are below the desired energy





3) Increasing Background Rates and Very Faint Mode

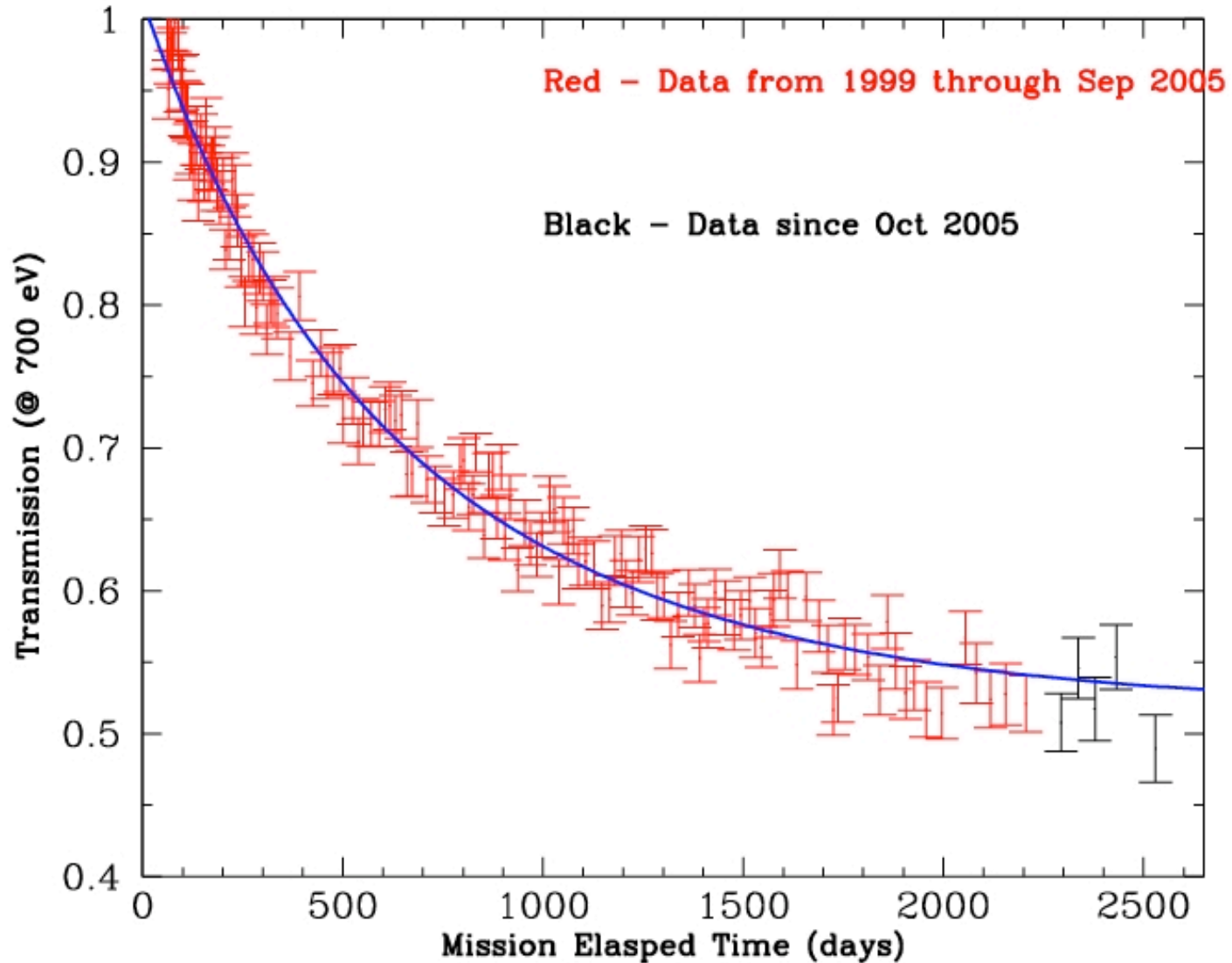
- The quiescent background rate has increased as Solar minimum has arrived
- The use of Very Faint (VF) mode with 6 CCDs on and with *no* energy filter produces total rates which are close to the TLM saturation limit (68 cts/s), currently 55-65 cts/s from background alone
- GOs must specify an energy filter when using 6 CCDs in VF mode

Typical Background Rates in 2006

<u>Configuration</u>	<u>Energy Filter</u>	<u>Rate</u>
ACIS-I,S2,S3	0.08-15.0 keV	55 cts/s
I2,I3,S1,S2,S3,S4	0.08-15.0 keV	63 cts/s
ACIS-S	0.08-15.0 keV	65 cts/s
ACIS-I,S2,S3	0.08-13.0 keV	45 cts/s
ACIS-I,S2,S3	0.08-12.0 keV	42 cts/s
I2,I3,S1,S2,S3,S4	0.08-13.0 keV	50 cts/s
I2,I3,S1,S2,S3,S4	0.08-12.0 keV	45 cts/s



4) Bonus Material: Contamination Growth



Data
Grant
(MIT)