MIT Kavli Institute **Chandra X-Ray Center**

MEMORANDUM
May 30, 2007

To:	Jonathan McDowell, SDS Group Leader
From:	Glenn E. Allen, SDS
Subject:	Mean biases
Revision:	1.0
URL:	http://space.mit.edu/CXC/docs/docs.html#mean_bias
File:	/nfs/cxc/h2/gea/sds/docs/memos/memo_mean_bias_1.0.tex

Anomalous features have been identified in many ACIS bias images. Events that occur on pixels adversely affected by an anomaly can have inaccurate pulse-height amplitudes and grades. To address this issue, the ACIS instrument team created mean bias images for each CCD at a focal-plane temperature of −120 °C.

1 Processing

To construct a bias B' from a mean bias $\bar{B}$ and an observation-specific bias B, perform the following steps for each node n of each CCD c:

1. Compute the median value $\bar{O}_{nc}$ of the 256 columns and 1024 rows of the mean bias $\bar{B}_{nc}$. Exclude pixels that have a bias value of 4094 and 4095 from this calculation.

2. Compute the median value O_{nc} of the observation-specific bias B_{nc}. Again, exclude pixels that have a bias value of 4094 and 4095 from this calculation.

3. Set the estimated bias value
$$B'_{nc} = \bar{B}_{nc} - \bar{O}_{nc} + O_{nc}. \tag{1}$$

4. Round B'_{nc} to the nearest integer to avoid introducing a systematic offset of -0.5 adu when the real-valued bias B' is converted to an integer image by truncating the decimal portions of the numbers.

5. Write the bias B' to a file as an array of two-byte integers. Also write the four values of O_{nc} to the keywords INITOCLA ($n = 0$), INITOCLB (1), INITOCLC (2) and INITOCLD ($n = 3$).