The in flight background causes charge blooms in ACIS Front Illuminated (FI) devices. The surrounding overclock corrected, raw images show the background as ACIS FI devices see it. Here black is below the typical readout noise of 2 adu and white is above the typical bias algorithm rejection threshold of 20 adu. 1 adu is about 4 eV or about 0.3 PI channels.

The flight software must remove as much of this noise as possible from the bias maps to avoid overcorrecting the pixels during event finding. This is most difficult when the charge in each pixel is relatively low or when the same pixels see charge in multiple frames during the bias computations. Bias computation details can be found in section 3.1.5 of the ACIS Operations Handbook.

The resulting superbias images for Epoch 10 are shown above. They have no visible artifacts from the cosmic ray background. Most are unremarkable (as seen in the images above), but some are quite striking (shown in the raw below). Less than 1% of bias frames have artifacts more than 10 columns wide.

Many instrument biases are combined to create one superbias for each three month "epoch". For each pixel:
• Find the standard deviation of values below the median
• Average values within 3 standard deviations of the median

The resulting superbias images for the Back Illuminated devices are also displayed here on the same scale as the Front Illuminated Devices. Because the clocking voltages and the capacitance of the devices themselves are different the nonuniformity due to the electronics looks very different.