Poster

Array-scale Thermal Characteristics of the Astro-H/SXS Microcalorimeter

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The XRS microcalorimeter array on Suzaku was thermally anchored via an epoxy bond to an alumina board connected to the heat sink via gold wire bonds. The weak coupling of this epoxy bond resulted in several non-ideal effects. Gain and resolution depended on the x-ray flux incident on the array. The resolution also depended on the cosmic-ray rate through particle interaction with the frame, and large energy deposition (>200 keV) into the frame produced a temperature pulse big enough to cause signal pulses on many pixels simultaneously, wasting telemetry bandwidth. In order to minimize these effects on the Astro-H SXS array, a thick gold layer was added to the frame of the array to increase its heat capacity and to permit heat sinking via gold wire bonds. This modification was successful, increasing the fluxes and energies at which such non-ideal effects occur to levels of no practical concern for Astro-H. We will present the thermal characterization of the array, including thermal conductance and crosstalk measurements and the results of pulsing the frame temperature via alpha particles, heat pulses, and the environmental background. We will also present the results of high-flux measurements performed as part of the flight calibration program.