Vibration Isolation Design for the Micro-X Rocket Payload

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Micro-X is a NASA-funded sounding rocket-borne x-ray imaging spectrometer. To enable high precision measurements of extended astrophysical systems, the Micro-X focal plane consists of an array of 128 transition edge sensor (TES) microcalorimeters, with resolution in the range of 4.5eV FWHM at 1keV. This high energy resolution makes it possible for Micro-X to take unprecedented spectra of supernova remnants and galaxy clusters, allowing measurements of velocity structure, ionization state, and elemental composition.

To achieve this high energy resolution, the detectors are cooled to 75mK by an adiabatic demagnetization refrigerator. One of the biggest challenges in payload design is to maintain the temperature of the detectors during the vibrational loads of a rocket launch. Several stages of vibration damping systems are implemented to prevent energy transmission from the skin to the detector stage. I will describe recent redesign efforts to improve vibration isolation prior to the projected launch in the spring of 2016.