

Poster

Vibration Isolation Design for the Micro-X Rocket Payload

Sarah Heine (Massachusetts Institute of Technology)

Co-Authors: S.N.T. Heine, E. Figueroa-Feliciano, The Micro-X Collaboration

Micro-X is a NASA-funded sounding rocket-borne X-ray imaging spectrometer that will allow high precision measurements of velocity structure, ionization state and elemental composition of extended astrophysical systems like supernova remnants and galaxy clusters. The Micro-X focal plane consists of an array of transition edge sensor microcalorimeters, each of which measures the temperature change of an absorber due to an incident photon in the soft X-ray band with projected resolution of about 2-4 eV. In order to maintain high energy resolution, the detectors are cooled to 50 mK by an adiabatic demagnetization refrigerator. One of the biggest challenges in payload design is to maintain the temperature of the detectors during launch. There are several stages of vibration damping systems to prevent energy transmission from the skin to the detector stage, which causes heating during launch. I will describe a major design effort to tune the resonance frequencies of these vibration isolation stages to reduce heating problems prior to the projected launch sometime in the spring of 2014.