

Considerations for the Next Compton Telescope Mission

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The GRAPWG has identified a high resolution Compton telescope as the highest priority major mission in gamma ray astrophysics following GLAST. This mission should provide 25-100 times improved sensitivity, relative to CGRO and INTEGRAL, for MeV gamma ray lines. It must have good performance for narrow and broadened lines and for discrete and diffuse emissions. Several alternative instrumental approaches are being pursued to achieve these goals. We discuss issues relating to this mission, including alternative detector concepts, instrumental configurations, background reduction techniques, orbits, and the need for international participation.

A germanium compton telescope with ~ 1 square meter of position-sensitive germanium detectors was the basis for one of the GRAPWG concepts. Preliminary monte carlo estimates for the sensitivities of this instrument are encouraging. However, can such an instrument be built within current cost limits for new initiatives? And can the formidable technical challenges of cooling large volumes of Ge and providing the large number of spectroscopy channels be met?

We have pursued the development of position-sensitive solid-state detectors (Ge, Si) for a high spectral resolution Compton telescope mission. Recent progress on the capabilities and technical issues for such a mission will be discussed.