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Poster
Large Solar Energetic Particle (SEP) events are some of the most dangerous sources of radiation contribution to space weather (SWx). Currently, the Heliophysics System Observatory does not currently have any instruments capable of measuring SEP protons with energies greater than ~100 MeV as noted in the recent NASA SWx Gap Analysis document as well as NOAA NESDIS-REQ-4500.3. To address these needs the Energetic Particle Laboratory at NASA/GSFC is developing a high-energy proton spectrometer consisting of a traditional silicon solid-state detector stack followed by a light integrating Cherenkov detector. The primary instrument is surrounded by a cylindrical anti-coincidence detector to remove measurements of particles that come from outside the aperture (or those that escape out the side of the instrument). HEPSTER will measure protons from 50 MeV – 1 GeV to answer the following science questions: 1) What is the source of high-energy SEPs? 2) What processes contribute to the spectral features observed in SEPs, especially the roll-over at high energies? 3) What processes dominate in the transport of high-energy SEPs through the heliosphere? 4) Are the highest energy SEP electrons accelerated by the same mechanism as SEP protons? HEPSTER will fill a critical SWx role to characterize the high radiation dose imparted by high-energy protons and improve forecasting due to the prompt signal of these particles. We discuss the development of HEPSTER and plans for potential future spaceflight.

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