

Abstract Submitted
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Solar Energetic Particles – A Radiation Hazard to Humans and Hardware in Space R.A. MEWALDT, California Institute of Technology — During large solar energetic particle (SEP) events the intensity of >30 MeV protons in nearby interplanetary space can increase by a million times over the steady intensity of galactic cosmic rays, creating a radiation hazard to both humans and hardware in space. With NASA now committed to sending astronauts to the Moon and possibly on to Mars, outside the protective cover of the Earth's magnetosphere, interest in understanding and forecasting large SEP events has taken on a new sense of urgency. The past solar maximum included four of the top ten SEP events of the space era. Fortunately, the array of spacecraft now in interplanetary space has provided greatly improved measurements of the composition and energy spectra of accelerated ions, leading to fresh insights into the nature of these events. The largest SEP events are accelerated by coronal and interplanetary shocks driven by coronal mass ejections (CMEs) traveling at >2000 km/sec. Although shock acceleration is ubiquitous in nature, its efficiency is highly variable, making it difficult to forecast the onset and evolution of large SEP events. This talk will describe the radiation hazards associated with the largest SEP events, discuss their frequency of occurrence, consider a worst-case SEP event, and describe how the radiation risks can be mitigated.

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