

## Low-altitude SEP precipitation associated with interplanetary shocks

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Enhancements of solar energetic particle (SEP) associated with interplanetary shocks are investigated using the low-earth orbit POES satellite data. The POES satellites have ion detectors that can measure from 30 keV to 7 MeV. We demonstrate the superposed epoch analysis of MeV ions associated with the interplanetary shocks during solar cycle 23. The enhancements can be seen at the invariant latitudes larger than 60 deg. It is expected that these ions are accelerated by the interplanetary shock.

Keywords: low-altitude SEP, interplanetary shock