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### **Understanding High-Energy Particle Radiation in Mars Orbit: Combining Data Sets from Mars Global Surveyor and Mars Express**

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#### **Abstract Text:**

The high energy charged particle environment (i.e. >30 MeV protons and ~2 MeV electrons) in Mars orbit is of interest both in terms of the science of the heliosphere and of the space radiation hazard to key orbital assets and astronaut health. These particles have two primary sources: a) galactic cosmic rays which form a relatively steady background, varying by factors of 2 or 3, and b) solar energetic particles (SEPs) accelerated either at the Sun or at interplanetary shock fronts, which can vary by several orders of magnitude. Several instruments in Mars orbit have been sensitive to these particles which penetrate the instrumentation creating a background signal which is dependent on high energy particles. Examination of background count rates from the Mars Global Surveyor Electron Reflectometer (MGS-ER, 1997-2006) and the Mars Express Electron Spectrometer (MEX-ELS, 2004-present), which are both proxies for fluxes of these penetrating particles, are studied since both instruments are influenced by the high energy environment. Here we have two primary goals. First, we wish to understand the variability in these data sets, both temporal (during quiet times and SEP events) and in regards to factors such as altitude and the planetary zenith angles formed with respect to the Sun and the Sun's motion through the galaxy. Second, using these two data sets, we wish to construct a consistent database of the penetrating particle radiation environment in Mars orbit from 1997 until the present. We will present preliminary findings with respect to both of the above goals.

#### **Session Selection:**

P032. Space environments and weather of unmagnetized or weakly magnetized solar system bodies

#### **Submitter's E-mail Address:**

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