

Solar Energetic Particles (SEP), Solar Modulation and Space Radiation: New Opportunities in the AMS-02 Era #2

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Dosimetry for a Deep-Space (Mars) Mission using Recent Measurements from RAD on the Mars Science Laboratory

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The space radiation environment is one of the outstanding challenges of a manned deep-space mission to Mars. To improve our understanding and take us one step closer to enabling a human Mars to mission, the Radiation Assessment Detector (RAD) on the Mars Science Laboratory (MSL) has been characterizing the radiation environment, both during cruise and on the surface of Mars for the past 4 years.

Perhaps the most significant difference between space radiation and radiation exposures from terrestrial exposures is that space radiation includes a significant component of heavy ions from Galactic Cosmic Rays (GCRs). Acute exposures from Solar Energetic Particles (SEPs) are possible during and around solar maximum, but the energies from SEPs are generally lower and more easily shielded. Thus the greater concern for long duration deep-space missions is the GCR exposure.

In this presentation, I will review the MSL RAD observations and discuss current approaches to radiation risk estimation used by NASA and other space agencies.

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