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Exploration of Mars (08)
Mars Sample Return and Human Exploration (2)

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MODEL CALCULATED RADIATION ENVIRONMENT AT MARS: 2012 AND BEYOND

Abstract

Model calculated radiation data and assessment of variations in the particle flux - protons, alpha particles, and heavy ions of the GCR (Galactic Cosmic Ray) environment is essential for all current and future intended exploration missions. Over the past several years, we have been developing model calculated particle flux as a function of time making use of NASA's HZETRN (High Z and Energy Transport) code along with the newly expanded nuclear fragmentation cross sections that are described by the quantum multiple scattering (QMSFRG) model. Model calculated particle flux predictions and comparisons with other observed measurement trends for the current and historical solar minimum (solar cycle 23) showed significantly higher particle flux and hence the contributed dose. Also, for the current solar cycle (24), it is expected that the solar maximum peak will be much lower (around June 2013) and hence higher radiation dose contribution is anticipated. We present our model calculated variations in the GCR particle flux at Mars during 2012 and beyond.