Current Solar Minimum and Radiation Environment at Mars: Model Calculations and Assessment 2009-2010

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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 # 23-24) show significantly higher particle flux and hence the contributed dose. We present our calculated and observed variations in the particle flux at Mars during the current solar minimum condition, 2009-2010.