Geophysical Research Abstracts, Vol. 7, 06122, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06122

Simulation of space radiation effects on Mars and Mercury

M. Gurtner, L. Desorgher, E.O. Flückiger

Physikalisches Institut, Space research and planetary sciences, University of Bern
(maria.gurtner@phim.unibe.ch, Fax-Nr.: +4131631 4405)

We have developed two Monte Carlo codes based on GEANT4 to simulate the interaction of space radiation with the environments of Mars and Mercury. For Mars we take into account the thin atmosphere and the soil of the planet. For Mercury the interaction of primary cosmic rays with the regolith and the propagation of the resulting secondaries in the weak hermean magnetic field are considered. With our applications it is possible to calculate the fluxes of secondaries produced by the interactions of galactic and solar cosmic rays with the planetary environments. The spectra of the secondary particles contain information about the chemical composition of the soil and the content of water in the surface. We can also study the quasi-trapping of secondary charged particles within the Hermean magnetosphere. Our applications offer a powerful tool for the analysis of space weather effects on Mars and Mercury. We will describe the codes and present simulation results.