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Towards an ab initio model for the radiation dose rate of cosmic rays on and near various planetary surfaces is our solar system: solar cycle-dependent modulation of galactic cosmic-ray intensities

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With the advent of commercial space travel and the proposed colonization of Mars and other planets, it has become even more important to study the cosmic ray radiation environment on, and near the surface of these bodies, in order to plan for future manned missions. Galactic cosmic rays, with a well-known 11 year cycle pose the primary radiation risk. Solar energetic particles that are frequent during solar maximum periods are sporadic and highly variable in terms of intensities, are a secondary radiation risk. In this study we explore an approach to model cosmic-ray radiation based on spacecraft data inputs and existing models for galactic cosmic rays, which will have implications for the future modelling of solar energetic particle transport as well.

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