



Cosmic ray interactions with the Venusian atmosphere

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The interactions between galactic cosmic ray particles and the atmosphere of Venus result in extensive nuclear and electromagnetic cascades that can affect cloud formation and atmospheric physics in deep atmospheric layers. In this work, we perform a calculation of the atmosphere ionization and ion production rates caused by cosmic rays, as a function of depth in the Venusian atmosphere. In order to perform this estimation, we use a Monte Carlo modeling technique based on the Geant4 software, previously applied for the Earth case; our predictions are afterwards compared to other estimations derived from previous studies. The current method is furthermore proposed as a paradigm for studying cosmic rays-atmosphere interactions in all terrestrial planets possessing atmospheres.