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2. CRs at Earth and planets (GEO)

Climate-related effects of cosmic rays

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The Earth is under permanent influence of the cosmic rays which are able to ionize the atmosphere. The ionization of the neutral atmosphere by energetic particles leads to the production of chemically active radicals which can destroy/produce ozone in the stratosphere/troposphere. The ionization also affect aerosol formation and global electrical circuit influencing the cloud properties. All these processes have further implications for the atmospheric dynamics and surface climate. The magnitude of the cosmic rays effects is modulated by the solar magnetic activity. In this review talk I will discuss all involved mechanisms and their representation in the state-of-art climate models. Different features of the simulated atmospheric response to cosmic rays variability will be presented and discussed. The influence of cosmic rays on the atmospheric chemistry and climate will be considered in a long term perspective for the periods when the solar activity substantially differs from the recent decades.