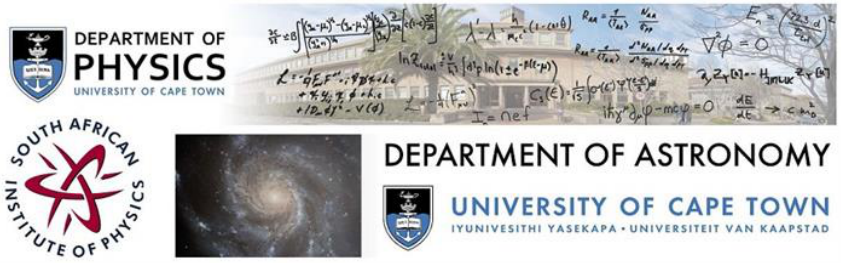

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The total solar modulation of low energy electrons in the heliosphere

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Abstract content
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Modeling and the subsequent understanding of the processes responsible for the solar modulation of Jovian and galactic electrons require that a source function for Jovian electrons and a heliopause spectrum (HPS) for galactic electron as an input spectrum be specified at the heliopause (assumed to be the solar modulation boundary). Using a comprehensive three-dimensional numerical model based on solving Parker's transport equation, both a new Jovian source function and HPS are used to compute the total modulation of electrons over an energy range from 1 MeV to 50 GeV. The modulation of low energy electrons is a particular handy tool to construct a suitable diffusion tensor to assure compatibility between model computations and observations from different spacecraft and balloon flights relevant to electrons in the heliosphere. The choice of a Jovian electron source function, a HPS and the choice of diffusion coefficients (DCs) influence the total modulation that occurs between the Earth and the heliospheric boundary. Observationally, the galactic electron intensity below ˜50 MeV is not known at Earth because of the dominance of the Jovian electrons at these energies in the inner heliosphere. With the HPS established, a prediction is made of what the galactic electron intensity at these low energies could be at the Earth, as a part of a long missing piece of the modulation puzzle.

Key words: Cosmic rays; Heliosphere; Solar modulation; Jovian electrons; Galactic electrons

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