ICRC2015

ICRC
The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands

Contribution ID: **97** Type: **Oral contribution**

The total solar modulation of low energy electrons in the heliosphere

Tuesday 4 August 2015 14:00 (15 minutes)

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. Energy spectra and radial intensity profiles of galactic and Jovian electrons are compared to previous and recent observations. Studying the radial profile of 12 MeV electrons enables us to compute the differential intensity of galactic electrons at this energy at the Earth.

Collaboration

– not specified –

Registration number following "ICRC2015-I/"

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Author: NNDANGANENI, Rendani (North-West University (Potchefstroom campus) South Africa)

Co-authors: Prof. POTGIETER, Marius (North-West University); Prof. WEBBER, William (New Mexico State University)

Presenter: NNDANGANENI, Rendani (North-West University (Potchefstroom campus) South Africa)

Session Classification: Parallel SH 07 Modulation I

Track Classification: SH-TH