



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Contribution ID: 354

Type: **Oral Presentation**

Numerical Modelling of Cosmic Rays in the Inner Heliosphere

Wednesday, 11 July 2012 08:40 (20 minutes)

Abstract content
 (Max 300 words)

The modulation of galactic cosmic rays in the heliosphere is described by the Parker transport equation (TPE). In its full capacity, this equation is too complicated to obtain satisfactory analytical solutions and is therefore solved numerically. It can be solved in one, two, or three spatial dimensions, one energy dimension and even a time dependence. Different numerical schemes have been implemented for the purpose of solving the TPE. This talk will present results obtained from models utilizing some of these schemes. Though the focus here will be on the results obtained using these models, some of the numerical schemes will also be discussed briefly. In particular, a numerical scheme based on stochastic differential equations will be illustrated to provide new ways of looking at the physics of cosmic ray modulation, as well as being a very computationally powerful approach. This model is applied to the accurate modelling of cosmic ray spectra at Earth which is important in heliospace physics, space weather and various branches of astrophysics.

Apply to be
 consider for a student
 award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
 PhD)?

MSc

Main supervisor (name and email)
and his / her institution

Prof M.S. Potgieter
Marius.Potgieter@nwu.ac.za
North-West University

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

No

Primary author: Mr RAATH, Jan-Louis (North-West University)

Co-authors: Prof. POTGIETER, Marius (North-West University); Mr STRAUSS, Roelf (North-West University)

Presenter: Mr RAATH, Jan-Louis (North-West University)

Session Classification: Space Science

Track Classification: Track D2 - Space Science