



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

Contribution ID: 391

Type: Oral Presentation

## A multi-detector study of the effect of a varying heliospheric current sheet tilt angle on cosmic-ray intensity

Wednesday, 11 July 2012 09:00 (20 minutes)

### Abstract content <br> (Max 300 words)

We investigate the behaviour of cosmic-ray intensities as measured by ground-based neutron monitors and balloon-borne detectors, as function of the corresponding heliospheric current sheet tilt angle. Three solar cycles with three changes in solar magnetic polarity are examined. The results are compared with predictions of cosmic-ray modulation models that include drift effects. The intensity-tilt plots for the different neutron monitors are compared with each other as a function of their mean response energy. These plots produce open loops with clockwise rotations for solar cycles 21 and 23 and with anticlockwise rotation for solar cycle 22, as predicted by drift models. However, the observed intensity-tilt loops for cycles 21 and 23 are larger than the loop for cycle 22 contrary to the drift model predictions, when the tilt angle observed simultaneously with the intensity is used. To explain this difference we invoke the time dependence of the tilt angle. This can be done by either calculating an effective tilt angle for a period prior to the intensity observation, or a simple time shift.

### Apply to be<br> consider for a student <br> award (Yes / No)?

yes

### Level for award<br>(Hons, MSc, <br> PhD)?

MSc

### Main supervisor (name and email)<br>and his / her institution

RA Burger  
10188738@nwu.ac.za  
North-West University, Potchefstroom Campus

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

No

**Primary author:** Mr MOLOTO, KATLEGO (NORTH WEST UNIVERSITY)

**Co-author:** Prof. BURGER, ADRI (NORTH WEST UNIVERSITY)

**Presenter:** Mr MOLOTO, KATLEGO (NORTH WEST UNIVERSITY)

**Session Classification:** Space Science

**Track Classification:** Track D2 - Space Science