ICRC'07

Mérida, Yucatán, Méx.

Contribution ID : **808**   Type : **Oral**

The effect of a latitudinal dependent solar wind speed on comic-ray modulation in a Fisk-type heliospheric magnetic field

Monday, 9 July 2007 09:42 (0:12)

Abstract content

The Fisk-model for the heliospheric magnetic field (HMF) was developed in an attempt to connect the structure of the magnetic field at large heliocentric distances to processes in and above the photosphere. A Fisk-Parker hybrid model that is valid for the whole heliosphere (Burger and Hitge 2004, ApJL, 617) and the whole solar cycle (Kruger 2006, MSc dissertation, NWU University) was developed for a constant solar wind. We have generalized the Fisk-Parker hybrid model for a solar wind dependent on latitude, as observed by Ulysses. The radial component of this HMF depends on the latitudinal gradient of the solar wind speed (Schwadron 2002, GRL, 29; Schwadron and McComas 2003, GRL, 30). We solved the three-dimensional steady state Parker transport equation for the entire model heliosphere to study the effect of this field and compared it with the hybrid field for a constant solar wind. The effect of the latitudinal solar wind is relative small. We also compared our results with a pure Parker field. As expected, the results are very similar since the average Fisk-type field is very similar to a Parker field.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

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Session Classification :   SH 3.1

Track Classification :   SH.3.1