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Manifestation of the solar global field changes in the long-term cosmic rays modulation

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Abstract content

We discuss the improving of the semi-empirical model of cosmic ray (CR) modulation proposed by us previously. In order to describe the long-term variations with more complete reflection in the CR modulation of the complex interaction of global and local solar magnetic fields it has been proposed to introduce into the model the next characteristics: the solar magnetic field polarity, the integral index iBr, the partial indexes as well the tilt of the current sheet and the flare index. The role of each index in the CR modulation is determined. For the multi-parameter description of long-term CR variations by using the integral index or one of four partial indexes the best fit for 1977-1999 period is obtained for the index iBr and the sector-odd index, characterising an inclined dipole. It is proposed that decreasing of density CR in minima of the last SA cycles (from cycle to cycle) could be explained by decreasing of the zone-odd index and similar decreasing of the vertical component of the total magnetic moment. The discrepancy between the model and observations increases beginning from the middle of 2000 therefore the problematic features of CR behavior and modeling during the 23rd cycle are discussed.

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

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 1 (SH), pages 473-476

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