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Study of the 27-day variation of the GCR anisotropy based on the experimental data and theoretical modeling

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Abstract content

We study features of the 27-day variation of the galactic cosmic ray (GCR) three dimensional anisotropy calculated by the global spherical analyses method (GSM) using Fourier harmonic frequency filter, Chree's diagram and epicyclograms. We found that the greater amplitudes of the 27-day variation of the GCR anisotropy in the minima epoch of solar activity for the $A > 0$ polarity period than for the $A < 0$ polarity period are related with the heliolongitudinal asymmetry of the solar wind velocity. The continuous background 27-day variation of the GCR anisotropy is observed owing to the existence of the long-lived 27-day variation of the solar wind velocity, especially in the minima epoch of solar activity. We develop 3-D stationary model based on the transport equation of GCR with the 3D modified Parker's spiral interplanetary magnetic field. We assume that 27-day variation of the GCR anisotropy is caused by the heliolongitudinal changes of the solar wind velocity; in this case solution of the transport equation gives the results compatible with the neutron monitors experimental data.

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'Olive, 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 597-600

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