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Gnevyshev gap in the frequency of cosmic ray decreases and Dst index

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Abstract content

We present the results of a study of the annual frequency distribution of cosmic ray decreases (amplitude $\geq 3\%$) for five solar activity cycles (19 to 23), using Climax neutron monitor hourly counting rate data. We confirm the main result of our earlier study, on a similar topic, over a shorter time interval (cyles 20, 21, and 22) that there is a notable gap in the distribution, near the maximum of each solar cycle, during the epoch of solar polar field reversal, in coincidence with the Gnevyshev gap. A similar study with the yearly averages of the ring current geomagnetic activity index Dst ($£$ -25 nT) leads to a similar result. The Dst index provides information on magnetic storms (generally with a Sudden Commencement) and is constructed from global mid-latitude and equatorial magnetograms. A typical magnetic storm lasts about a week. Dst has negative values; a larger negative Dst implies a more intense magnetic storm with adverse terrestrial consequences. The common source for both effects (cosmic ray and geomagnetic) is the interplanetary remanents of coronal mass ejections (ICMEs).

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 385-388

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