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Linking cosmic ray intensities to cutoff rigidity through multifractal detrented fluctuation analysis

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Abstract

We use multifractal detrented fluctuation analysis (MFDFA) to investigate the relationship between magnetic rigidity or "cutoff rigidity" and the variability and multifractal behavior in the time series of the cosmic ray flux on Earth, which is detected by neutron monitors on the Earth's surface. Because the cutoff rigidity depends strongly on the geographical latitude of the detectors, not all detectors produce equal cosmic ray counts. Our results indicate that there is some bias in the chaotic nature of the cosmic ray series associated with the latitude of the monitoring stations. We obtain an important relationship