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Measurements of solar diurnal ansiotropy with GRAPES-3 experiment

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Harmonics in the cosmic ray solar diurnal anisotropy up to third have been experimentally observed. Very high statistics is required to investigate higher harmonics because of exceedingly small amplitudes. The GRAPES-3 experiment located in Ooty, India contains a large area (560˜m^2) tracking muon telescope that provides a high statistical record of the muon flux ($\sim 4\times10^9$ per day). This allows measurement of tiny variations in cosmic ray intensity (0.01%) caused by various solar phenomena. After making appropriate corrections for the efficiency of the detector and atmospheric pressure variations, a continuous stream of one year data was used to investigate the diurnal anisotropy. A fast Fourier transform based analysis revealed clear presence of the first three harmonics as well as the fourth harmonic for the first time. Further, a clear rigidity dependence of each of the four harmonics was also obtained. These results will be presented during the conference.

Collaboration

– not specified –

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