

DIFFUSIVE AND CONVECTIVE ANISOTROPIES OF HIGH RIGIDITY GALACTIC COSMIC RAYS

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Abstract

The data obtained with a variety of detectors on earth (neutron monitors, ion chambers, and muon telescopes underground) as well as the in-situ measurements of the magnetized solar plasma made in space are analyzed for three solar cycles (20 to 22) to study the main characteristics of the steady state diffusive (A_d) and convective (A_c) anisotropies over a wide range of the galactic cosmic ray (GCR) spectrum in the inner heliosphere; A_d is driven by the radial particle density gradient (Gr) while A_c arises from the sweeping action (radially outwards) of the magnetized solar wind. Both 11-year and 22-year effects stand out conspicuously in the two anisotropies; some of them are rigidity dependent and some depend on the polarity of the solar polar magnetic fields. The physical significance of our results will be discussed.