

SMALL SCALE STRUCTURES OF THE HELIOSPHERIC MAGNETIC FIELD AND THE PROPAGATION OF COSMIC RAYS

G. Erdős (1), Z. Németh (1) and A. Balogh (2)

(1) KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary, (2) The Blackett Laboratory, Imperial College, London, UK.

`erdos@rmki.kfki.hu`

The heliospheric magnetic field is rich in highly fragmented small scale structures. The magnetic background strongly influences the motion of the charged particles of relatively low rigidity. Using high time resolution magnetic field data measured by the magnetometer onboard Ulysses, we study the small scale magnetic structures, including fractal structures and discontinuities. We describe the small scale magnetic structures with some parameters, including the fractal dimension and frequency of discontinuities. The dependence of these parameters on the heliospheric location and on the sunspot cycle is determined. A simple model of turbulence in the solar wind is presented, in order to explain the variations of the parameters along the off-ecliptic orbit of Ulysses. The implications of the observations on the theories of cosmic ray modulation is discussed.