

ON THE WAVELET APPROACH TO COSMIC RAY VARIABILITY

K. Kudela (1), M. Storini (2,3), J. Rybak (4), and A. Antalova (1)

(1) IEP SAS SK,(2) IFSI/CNR, Roma,IT,(3)Univ. Roma Tre IT,(4)AI SAS SK

Contrary to conventional spectral analysis the wavelet transforms are suitable for description of nonstationary processes containing multiscale features, detection of singularities and analysis of transient phenomena and are used in many geophysical applications [1]. This approach is not yet used frequently for cosmic ray time series with few exceptions as e.g. [2]. Using the discrete transforms with the Haar functions as well as various mother functions in the toolkit [3] we report results of temporal evolution of cosmic ray variability detected by neutron monitors at different cutoff rigidities. Comparison with IMF time series is done. The methods are providing simple inspection of both quasiperiodic contributions to the signal as well as detection of transient irregular signals. In particular the Gnevyshev gap features in cosmic rays are described by this approach.

1. Kumar, P., and E. Foufoula-Georgiou, *Reviews of Geophys.*, 35, 4, p. 385-412, 1997
2. Astafyeva, N.M., and G.A. Bazilevskaya, *Phys. & Chem. of the Earth (C)*, v. 25, No 1-2, p. 129-132, 1999
3. Torrence, Ch., and G. Compo, *Bull. of the American Meteorological Soc.*, 1998