Geophysical Research Abstracts, Vol. 8, 00658, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00658

Estimation of probabilistic measure for time series of geomagnetic ap-index by symbolic dynamics methods

I. Makarenko

Institute of Mathematics, Republic of Kazakhstan (chaos@math.kz)

The main idea of Markoff prediction of time series is to construct a stochastic cascade which is equivalent to a recurrent iterated function system (RIFS). An attractor of RIFS is a support of invariant measure which can be estimated from experimental data. Solution of the inverse problem in RIFS theory let us find coefficients of constructive maps and probabilities to choose each of the maps. Then predictor is realized as a Markoff chain. The goal of this paper is to estimate a probabilistic measure for time series of geomagnetic Ap-index. Choose of some threshold value, which is identified as magnetic storm event, we can transform the time series to a binary sequence or 'text' consisting of 0 and 1. Using binary notation we can represent each subsequence or 'word' as a point in unit interval. Frequency histogram of the words gives an estimate of a probabilistic measure. This measure has been received in this paper. The calculated multifractal spectra have shown that this measure has well-defined multifractal properties.