Multiscale approaches in magnetospheric physics and their impact on geomagnetic data processing

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A b s t r a c t: There exist theoretical and experimental evidences that the solar wind – magnetosphere–ionosphere system is essentially nonlinear. It is conjectured that magnetospheric multiscale space-time structures with unexpected properties such as intermittent abrupt fluctuations, pattern formation, scaling, self-organization near criticality, etc. may appear as a natural consequence of this nonlinearity. In this paper we use multifractal techniques to show that the underlying multiscale phenomena can be described properly.

Key words: geomagnetic field, multifractal scaling, singularities

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