

Chaos-geometric approach to analysis and forecasting evolutionary dynamics of complex systems: atmospheric pollutants dynamics

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Abstract: An effective computational complex approach to analysis, modelling and forecasting evolutionary chaotic dynamics of complex nonlinear geosystems (atmospheric pollutants dynamics) is presented. The approach is based on the combined using dynamical geosystem models and non-linear analysis and chaos theory methods such as the autocorrelation function method, multi-fractal formalism, wavelet analysis, mutual information approach, correlation integral analysis, false nearest neighbour algorithm, Lyapunov exponent's analysis, surrogate data method, stochastic propagators method, memory and Green's functions approaches etc (in [1-3]). The results of numerical studying the deterministic chaos elements in the pollutant concentration (dioxide of nitrogen etc in atmosphere of industrial cities of the Odessa and Gdansk regions) time series are presented. References. [1] Khetselius O., Bunyakova Y.: Proc. of 8th Int. Carbon Dioxide Conf.-Jena, Germany, 2009. [2] Glushkov A.V.: Methods of a Chaos Theory. Odessa: Astroprint, 2012. [3] Glushkov A.V., Khetselius O.Yu., Svinarenko A.A., Buyadzhi V.V.: Methods of computational mathematics and mathematical physics, P.1. Odessa: TEC, 2015.

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