Local Correlation's Potential for Noise Reduction and Symbolic Partitions

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We investigate local correlation dimension-based noise-cleaning of time series, where points having anomalously large dimensions are iteratively removed from the reconstructed attractor. We find an optimal range for the number of iterations in which the algorithm yields good results. Choosing non-local ranges for the linear regression yields a new method for finding nonhyperbolic tangency points. The method is also applicable for noisy systems with unknown dynamics; in this case, noise facilitates the detection of the points.

Key words: Noise Cleaning; Fractal Dimensions; Nonhyperbolic Tangency Points.