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A Numerical Approach to Ergodic Problem of Dissipative Dynamical Systems FREE

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Abstract

Based on the Lyapunov characteristic exponents, the ergodic property of dissipative dynamical systems with a few degrees of freedom is studied numerically by employing, as an example, the Lorenz system. The Lorenz system shows the spectra of $(+, 0, -)$ type concerning the 1-dimensional Lyapunov exponents, and the exponents take the same values for orbits starting from almost of all initial points on the attractor.

This result suggests that the ergodic property for general dynamical systems not necessarily belonging to the category of the axiom-A may also be characterized in the framework of the spectra of the Lyapunov characteristic exponents.

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