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Dynamical study of Lyapunov exponents for Hide’s coupled dynamo model. (English)
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Summary: In this paper, we introduced the Lyapunov exponents (LEs) as a significant tool that is used to study the numerical solution behavior of the dynamical systems. Moreover, Hide’s coupled dynamo model presents a valuable dynamical study. We simulate the convergence of the LEs of the model in three cases by means of periodic flow, regular flow, and chaos flow. In addition, we compared these cases in logic connections and proved them in a mathematical way.

MSC:
37D25 Nonuniformly hyperbolic systems (Lyapunov exponents, Pesin theory, etc.)
34D08 Characteristic and Lyapunov exponents of ordinary differential equations

Keywords:
Lyapunov exponents; dynamical system; dynamo model; periodic flow; chaotic flow; regular flow

Full Text: DOI

References:


[16] S. Boulaaras and A. Allahem , Two-dimensional mathematical model of the transport equations of some pollutants and their


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