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Unraveling Complex Dynamics and Active Control of a Novel Multi-equilibrium Hyperchaotic Memristive-Based Variable-Boostable System

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This paper presents a detailed exploration into the dynamics of an innovative 5D variable-boostable (V-B) system, incorporating series-based memristors. The investigation traces the transition from integer 3D-chaotic flows to 5D-integer-order hyperchaotic flows, shedding light on the system's evolution and enhanced capabilities. A thorough analysis is conducted, focusing on the system's multi-equilibrium points and linear stability. Additionally, the behavior of the system is scrutinized through comprehensive examinations, including bifurcation diagrams, Lyapunov exponents, 0-1 chaos test, and the coexistence of attractors. Finally, active control strategies of the new system to establish global stability within the system have been achieved. The findings contribute to the understanding of the intricate dynamics exhibited by the 5D V-B
system, offering valuable insights into its potential applications and implications for future research.

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