Modelling and MultiSim Simulation of a New Hyperchaos System with No Equilibrium Point

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Abstract: Crypto-devices and encryption applications make good use of nonlinear dynamical systems with hyperchaotic attractors due to their inherent complexity. Using four quadratic nonlinearities, a new 12-term hyperchaos system with hidden attractor is proposed in this research paper. It is established that the new hyperchaos system has no balance point and a hidden attractor exists for the system. Coexisting attractors and multistability are also proven to exist for the new system. The Kaplan-Yorke fractal dimension is determined for the new hyperchaos system with hidden attractor. MultiSim circuit design and simulation are carried out for the validation and real-world applications of the new hyperchaos system with hidden attractor. Finally, the chaos control results based on feedback control are also derived for the new 4D hyperchaotic system with no equilibrium point.

Keywords: *hidden attractor; hyperchaotic systems; MultiSim design; chaos control.*

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