



A New Chaotic System with Line of Equilibria : Dynamics, Passive Control and Circuit Design,

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Abstract:

A new chaotic system with line equilibrium is introduced in this paper. This system consists of five terms with two transcendental nonlinearities and two quadratic nonlinearities. Various tools of dynamical system such as phase portraits, Lyapunov exponents, Kaplan-Yorke dimension, bifurcation diagram and Poincarè map are used. It is interesting that this system has a line of fixed points and can display chaotic attractors. Next, this paper discusses control using passive control method. One example is given to insure the theoretical analysis. Finally, for the new chaotic system, an electronic circuit for realizing the chaotic system has been implemented. The numerical simulation by using MATLAB 2010 and implementation of circuit simulations by using MultiSIM 10.0 have been performed in this study.

Keywords:

Chaotic system Dynamical system Electronic circuit Line equilibrium Passive control

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