

Abstract

We investigated the dynamical behavior of a modified Sprott I system by introducing a quartic nonlinear function. To quantitatively evaluate the influence of the function on the system, we analysed equilibrium point, stability and numerically plot the Lyapunov exponent and bifurcation diagrams of the modified system. The analysis indicated that the new system is chaotic. The stability results obtained in this work for the global chaos synchronization of identical systems using active nonlinear control are established using Lyapunov stability theory. Experiments using off-the-shelf components were carried-out to verify the results obtained from analytical and numerical simulations.