

IMPLEMENTATION OF THE FRACTIONAL-ORDER CHEN-LEE SYSTEM BY ELECTRONIC CIRCUIT

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Abstract

In recent years, there has been expanding research on the applications of fractional calculus to the areas of signal processing, modeling and controls. Analog circuit implementation of chaotic systems is used in studying nonlinear dynamical phenomena, which is also applied in realizing the controller development. In this paper, chain fractance and tree fractance circuits are constructed to realize the fractional-order Chen-Lee system. The results are in good agreement with those obtained from numerical simulation. This study shows that not only is this system related to gyro motion but can also be applied to electronic circuits for secure communication.

Keyword : Fractional order; Chen-Lee system; circuit implementation; fractance.