

A new finding of the existence of Feigenbaum's constants in the  
fractional-order Chen-Lee system

Hsien Keng Chen, 許隆結, Lap Mou Tam, Seng Kin Lao

Mechanical Engineering

Engineering

ljsheu@chu.edu.tw

Abstract

This paper examines the universal quantitative properties of the fractional- and integer-order Chen-Lee systems. A series of bifurcation diagrams of the system were generated in order to measure Feigenbaum's constants. It was found that the measured values of the integer-order system were accurately approaching their universal constants, while the errors between measured values of the fractional order system and the universal constants were not very large. The results showed that both the fractional and integer-order Chen-Lee systems belonged to a quadratic map. To the authors' knowledge, this is the first paper to measure Feigenbaum's constants in fractional-order systems

Keyword : Feigenbaum's constants, fractional-order Chen-Lee system