Chaos Synchronization between Fractional-Order Lesser Date Moth Chaotic System and Integer-Order Chaotic System via Active Control

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Abstract: This paper investigates the phenomenon of chaos synchronization between the fractional-order lesser date moth and the integer-order chaotic systems. Based on the Lyapunov stability theory and numerical differentiation, an active control is obtained to achieve the synchronization between the fractional-order and the integer-order chaotic systems. Numerical examples are implemented to illustrate and validate the results.

Keywords: *chaos; synchronization; active control; fractional-order chaotic system; integer-order chaotic system.*

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1 Introduction

Chaos is a very interesting nonlinear phenomenon that has been intensively studied over the past two decades. The chaos theory is found to be useful in many areas such as data encryption [19], financial systems [17,18], biology [22] and biomedical engineering [2], etc. Fractional-order chaotic dynamical systems have begun to attract a lot of attention in recent years and can be seen as a generalization of chaotic dynamic integer-order systems. The synchronization between the fractional-order chaotic system and the integer-order chaotic system is thoroughly a new domain and it began to attract much attention in

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