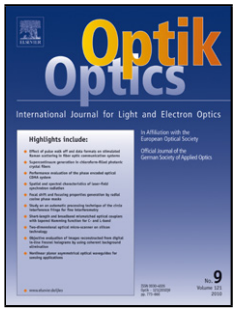

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Dual projective synchronization between integer-order and fractional-order chaotic systems

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In this article, based on tracking control strategy and the stability theory of the fractional differential equation, a new controller has been designed to realize the dual projective synchronization (DPS) between integer-order and fractional-order chaotic systems**.** The proposed method is respectively applied to dual projective synchronization of the following two pairs of chaotic systems: Sprott-Lü and Liu-Chen chaotic systems. The numerical simulations verify the correctness and effectiveness of the strategy.

Keywords: integer order; fractional order; chaotic system; dual projective synchronization, tracking control strategy

1. Introduction

Since Pecora and Carroll [1] firstly put forward the concept of synchronization of chaotic systems and achieved synchronization between chaotic systems through simple coupling, it was applied to many fields such as physics, chemistry, biology, neuron system, secure communications, laser dynamics and so on. Many scholars studied various types of synchronization with respect to integer or fractional order chaotic system. There are complete synchronization [2], phase synchronization [3], projective synchronization [4-6], generalized synchronization [7], etc.

Dual synchronization is a special case in synchronization, where two drive systems are synchronized to two response systems with a scalar signal generated by a linear

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