



Generalized Synchronization Between Two Chaotic Fractional Non-Commensurate Order Systems with Different Dimensions

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Abstract: This paper deals with the problem of generalized synchronization between two chaotic and hyperchaotic fractional non-commensurate order systems with different dimensions. By designing an active control technique, the sufficient conditions for achieving generalized synchronization are derived by using the Laplace transform technique and final value theorem. Numerical simulations are also given to illustrate and validate the generalized synchronization results derived in this paper.

Keywords: *chaos; generalized synchronization; fractional non-commensurate order; active control.*

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1 Introduction

Chaos synchronization phenomena have received increasing attention in the study of dynamical systems, because they can be applied in vast areas of engineering and information science, in particular, in secure communication, control processing and cryptology [1–4]. Various methods in chaos synchronization have been proposed [5–7]. Most of the synchronization methods focus on integer order chaotic systems in both continuous and discrete time.

Recently, fractional calculus has attracted a lot of attention and has become an excellent instrument to describe the dynamics of complex systems. Based on the stability

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