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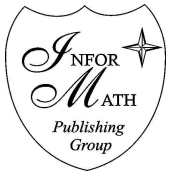

A Simple Approach for Q-S Synchronization of Chaotic Dynamical Systems in Continuous-Time

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Abstract: In this paper, the problem of Q-S synchronization for arbitrary dimensional chaotic dynamical systems in continuous-time is investigated. Based on new control scheme and Lyapunov stability theory, a simple synchronization approach is designed to achieve Q-S synchronization between n-D and m-D continuous-time chaotic systems in arbitrary dimension d. In order to verify the effectiveness of the proposed method, our approach is applied to some typical chaotic systems and numerical simulations are given to validate the derived results.

Keywords: *chaos; Q-S synchronization; continuous-time systems; control scheme; Lyapunov stability.*

Mathematics Subject Classification (2010): 37B25, 37B55, 93C10, 93C55.

1 Introduction

Since the discover of synchronization [1, 2], chaos synchronization has played important roles in sciences and enginering, due to its potential applications in secure communication and telecommunications [3–6], control theory [7, 8], biology [9, 10], lasers [11], and so on. Chaos synchronization has received increasing interest and various methods have been proposed for synchronization of chaotic dynamical systems such as adaptive control [12], backstepping design [13], sliding mode control [14], and generalized hamiltonian systems approach [15, 16] etc. Many types of chaos synchronization have been presented such as complete and anti-synchronization [17, 18], hybrid function projective synchronization [19], reduced order function projective combination synchronization [20], etc. Among all types of synchronization, Q-S synchronization is an interesting generalized-type of synchronization which has been extensively considered [21, 22]. In Q-S synchronization,

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