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Projective synchronization of uncertain scale-free network based on modified sliding mode control technique

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We modify sliding mode control technique from the synchronization of a single dynamic system to the synchronization of complex network. Projective synchronization of uncertain scale-free network is investigated based on modified sliding mode control technique. Further, the sliding surfaces, the identification laws of uncertain parameters and the control inputs are designed, and the condition of realizing projective synchronization of uncertain scale-free network is obtained. Finally, the Logistic systems with chaotic behavior are taken as nodes to constitute the scale-free network and the synchronization target. The simulation results show that the synchronization mechanism is effective.

Keywords: sliding mode control; projective synchronization; scale-free network; parameter identification

1 Introduction

Generally, most of the dynamic systems can be represented in the form of various complex networks. The network consists of a large number of interconnected nodes in which each node represents some prescribed contents. Since Erdős, Watts and Barabási presented respectively random graph ^[1], small-world network ^[2] and scale-free network ^[3], many great progresses have been made on the establishment of complex network models, the properties and dynamics of networks. Especially, the network synchronization has become the fascinating dynamic behavior of complex

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