Complex Network Synchronization of Coupled Time-Delay Chua Oscillators in Different Topologies

O.R. Acosta-Del Campo [1], C. Cruz-Hernández [2*], R.M. López-Gutiérrez [1], A. Arellano-Delgado [1], L. Cardoza-Avendaño [1] and R. Chávez-Pérez [2]

[1] *Faculty of Engineering, Baja California Autonomous University (UABC), Km. 103, Carretera Tijuana-Ensenada, 22860 Ensenada, B.C., México.*
[2] *Electronics and Telecommunications Department, Scientifc Research and Advanced Studies Center of Ensenada (CICESE), Carretera Ensenada-Tijuana, No. 3918, Zona Playitas, 22860 Ensenada, B.C., México.*

Abstract: In this paper, complex network synchronization of coupled hyperchaotic nodes (described by time-delay Chua oscillators) in different topologies is reported. In particular, networks synchronization in nearest-neighbor, small-world, open ring, tree, star, and global topologies are achieved. For each topology, the number of hyperchaotic nodes is evaluated that can be connected in the dynamical networks for synchronization purpose, which is based on a particular coupling strength. In addition, complex network synchronization for the mentioned topologies with unidirectional and bidirectional coupling of hyperchaotic nodes is considered.

Keywords: *complex networks; nearest-neighbor topology; small-world topology; open ring topology; tree topology; star topology; global topology; network synchronization; hyperchaotic time-delay Chua oscillator.*

Mathematics Subject Classification (2000): 37N35, 65P20, 68P25, 70K99, 93D20, 94A99.

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* Corresponding author: mailto:ccruz@cicese.mx