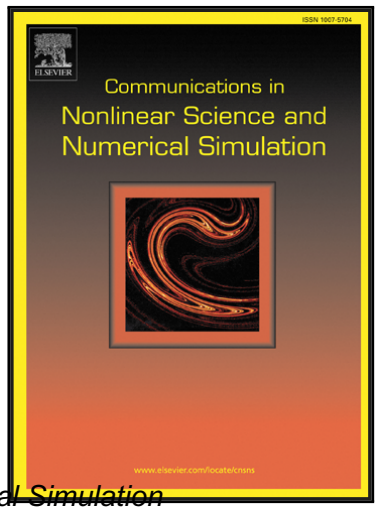

Experimental evidence of chaos synchronization via cyclic coupling

A.I. Egunjobi, O.I. Olusola, A.N. Njah, Suman Saha, S.K. Dana

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Highlights

- Coupling topology plays a crucial role in synchronization even in simple models of two chaotic systems such as the Sprott system, the Rossler system and the Lorenz system. Coupling via some specific variables of the systems cannot allow them emerge into synchrony while via other variables might implement a mixed type synchrony. The target of synchronization is to realize synchrony of amplitude and phase or simply phase uniformly in all the coupled variables of systems. A type of cyclic coupling is beneficial to successful implementation of such synchrony and even enhances synchrony in such systems where the conventional bidirectional coupling fails. In cyclic coupling, one oscillator sends a signal to another via one pair of state variables and receives a feedback from the other through a different pair of state variables and thereby establish a mutual interaction. This is like two individuals, one pulling-by-hand and the other pushing-by-leg and thereby interacting in forward and backward push-pull motion in a cyclic order. Such a cyclic bidirectional interaction may arise in a natural situation such as the neuronal interaction in the brain. We implement this cyclic coupling, in electronic experiments, and evidence the benefits of cyclic coupling.