

TIME-DELAYED FEEDBACK CONTROL OF SPATIOTEMPORAL DYNAMICS IN A NETWORK OF DIGITAL PHASE-LOCKED LOOPS

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Digital phase-locked loops (DPLLs) are unavoidable electronic system in modern network communication. They are nonlinear in characteristics; therefore, the collective dynamics of those systems are extremely complex. This paper explores that; time-delayed feedback control algorithm is able to control unstable spatiotemporal dynamics that appear in a one dimensional network of locally coupled DPLLs. Such network shows several unstable spatiotemporal patterns; like, frozen random pattern, pattern selection, spatiotemporal intermittency and spatiotemporal chaos. It is explored that, proper feedback control parameter is able to control unstable dynamics into synchronised dynamics. Analytical stability condition for the controlled network is also derived.
