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Effect of Delays and Network Topology in Spatiotemporal Pattern Formation RHONDA DZAKPASU, MICHAL ZOCHOWSKI, Department of Physics, Biophysics Research Division, University of Michigan — Synchronization between connected neurons is believed to play a role in the processing of information within the brain. This implies a temporal ordering in the discharge of their electrical signals but since the axons have a finite length over which a signal must traverse, information relating to a particular process and emanating from different neurons reaches a target neuron after a time delay. We investigate the effects of delays on the formation of temporally ordered states in a model network with SWN topology. We show that incorporation of two different types of delay, length independent and length dependent, lead to dramatically different properties of the network. In the first case, the formation of global random connections leads to an increase in temporal ordering, while in the second case locally ordered clusters are annihilated and form a disordered state.

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