

Abstract Submitted
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Transient Spatiotemporal Chaos in a Synaptically Coupled Neural Network¹ JACOPO LAFRANCESCHINA, RENATE WACKERBAUER, University of Alaska Fairbanks — Spatiotemporal chaos is transient in a diffusively coupled Morris-Lecar neural network. This study shows that the addition of synaptic coupling in the ring network reduces the average lifetime of spatiotemporal chaos for small to intermediate coupling strength and almost all numbers of synapses. For large coupling strength, close to the threshold of excitation, the average lifetime increases beyond the value for only diffusive coupling, and the collapse to the rest state dominates over the collapse to a traveling pulse state. The regime of spatiotemporal chaos is characterized by a slightly increasing Lyapunov exponent and degree of phase coherence as the number of synaptic links increases. The presence of transient spatiotemporal chaos in a network of coupled neurons and the associated chaotic saddle provides a possibility for switching between metastable states observed in information processing and brain function.

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