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Stochastic Synchronization in Lattices of Model Neurons ANDY MUELLER, KLAUS LEHNERTZ, Helmholtz-Institute for Radiation and Nuclear Physics and Dept. of Epileptology, University of Bonn — It has been shown recently that a wide class of uncoupled limit-cycle oscillators can be fully synchronized by a common weak additive white noise. We study the influence of noise on the dynamics of mutually uncoupled lattices that are composed of periodically spiking model neurons with an increasing complexity. In order to approximate characteristics of noise found in empirical data we use an Ornstein Uhlenbeck process (OUP) as the driving force. Varying the correlation time and the intensity of the OUP we study the time to full synchronization (ST) and the largest Lyapunov exponent (LLE) of the systems. For all investigated correlation times LLE is negative indicating the convergence of the trajectories of the systems. For a constant noise intensity we observe that both ST and LLE exhibit a minimum for a particular correlation time of the OUP. We discuss the possible relationship between the correlation time of the OUP and the time scales of the investigated systems.

Andy Mueller
Helmholtz-Institute for Radiation and Nuclear Physics and Dept. of Epileptology, University of Bonn

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