

Synchronization of uncoupled excitable systems induced by white and coloured noise

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We study, both numerically and experimentally, the synchronisation of uncoupled excitable systems due to a common noise. We consider two identical FitzHugh-Nagumo (FHN) systems, which display both spiking and non-spiking behaviours in chaotic or periodic regimes. An electronic circuit provides a laboratory implementation of this dynamics. Synchronisation is tested with both white and coloured noise showing that coloured noise is more effective in inducing synchronisation of the systems. We also study the effects on the synchronisation of parameter mismatch and of the presence of intrinsic (not common) noise, and we conclude that the best performance of coloured noise is robust under these distortions. Similar results are being obtained experimentally in a circuit with four uncoupled FHN with common noisy input.