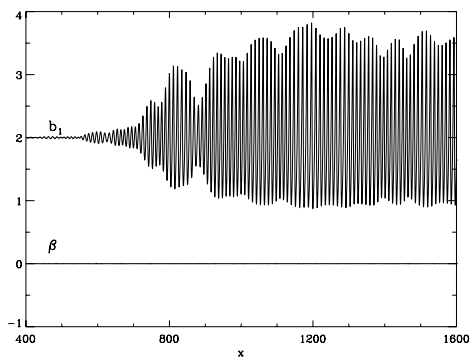


Controlled replication of noise-sustained structures through synchronization

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We consider two identical 1D autocatalytic systems with Gray–Scott (GS) kinetics, driven towards identical convectively unstable regimes. Their respective A -components are submitted to spatiotemporal Gaussian white noises with variances σ_1 and σ_2 . Noise-sustained structures (NSS) develop in such a situation, as shown in [1]. When coupled in a master–slave configuration, in such a way that the B -component of the slave system 2 senses the difference between its concentration and that of the master system 1, a numerical simulation reveals that—even when perturbed by noise—system 2 replicates the NSS arising in system 1 to a very high degree of precision, as expressed by several measures of synchronization. One of these measures is the deviation field $\beta = b_1 - b_2$, exhibited in the figure—in the same scale as b_1 —for a snapshot of b_1 . Numerous applications for this effect can thus be envisioned.



- [1] B. von Haften and G. Izús, Phys. Rev. E **67**, 056207 (2003).