Occasional coupling synchronization: Transient uncoupling and On-off coupling schemes

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Synchronization of chaotic systems may be observed when two or more chaotic systems are coupled at all times. Intriguingly, synchronization is also possible by occasionally uncoupling two or more chaotic dynamical systems. The latter type of scheme falls in the set of synchronization schemes called occasional driving synchronization scheme. Transient uncoupling and on-off coupling are two examples of the occasional driving synchronization scheme. In the case of the transient uncoupling scheme, the coupling is active only over a subset of phase space of the driving system. In the on-off coupling scheme, the coupling is alternately active (on) and inactive (off) for some specified fractions of time. However, in both the schemes, the coupling region (spatial or temporal respectively) are chosen mostly by trial and error. We have calculated the minimum coupling strength required to synchronize the oscillators using both the schemes . We have also compared both the schemes in terms of the strength of synchronization. For definiteness, we have worked with coupled Rossler oscillator to illustrate our results.

Full paper not reported elsewhere. We are submitting the full manuscript soon Chaos.

References

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