

Chaos in Small-World Networks

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A nonlinear small-world network model has been presented to investigate the effect of nonlinear interaction and time delay on the dynamic properties of small-world networks. Both numerical simulations and analytical analysis for networks with time delay and nonlinear interaction show chaotic features in the system response when nonlinear interaction is strong enough or the length scale is large enough. In addition, the small-world system may behave very differently on different scales. Time-delay parameter also has a very strong effect on properties such as the critical length and response time of small-world networks.

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