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Summary: This paper is concerned with the problem of asymptotic synchronization for a class of uncertain complex networks with delays and general uncertain perturbations. In order to cope with the bad effects generated by the uncertain perturbations, a novel hybrid adaptive and impulsive controller is designed such that the complex network can be asymptotically synchronized onto an isolate chaotic system with uncertain perturbations. All the perturbations can be different from each other. On the basis of a new lemma, squeezing rule, and Lyapunov-Krasovskii functionals, several sufficient conditions guaranteeing the realization of the synchronization goal are derived. It is shown that the designed hybrid controllers exhibit powerful robustness. Some existing results are improved and extended. Numerical simulations verify the effectiveness of the theoretical results and the robustness of the new controller.

MSC:

93C15 Control/observation systems governed by ordinary differential equations
34D06 Synchronization of solutions to ordinary differential equations
34K45 Functional-differential equations with impulses
93C40 Adaptive control/observation systems

Keywords:

complex networks; synchronization; uncertainties; adaptive control; impulsive control

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References:


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