Bidirectional Partial Generalized Synchronization in Chaotic and Hyperchaotic Systems via a New Scheme

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Abstract: In this paper, a bidirectional partial generalized (lag, complete, and anticipated) synchronization of a class of continuous-time systems is defined. Then based on the active control idea, a new systematic and concrete scheme is developed to achieve bidirectional partial generalized (lag, complete, and anticipated) synchronization between two chaotic systems or between chaotic and hyperchaotic systems. With the help of symbolic-numerical computation, we choose the modified Chua system, Lorenz system, and the hyperchaotic Tamasevicius-Namajunas-Cenys system to illustrate the proposed scheme. Numerical simulations are used to verify the effectiveness of the proposed scheme. It is interesting that partial chaos synchronization not only can take place between two chaotic systems, but also can take place between chaotic and hyperchaotic systems. The proposed scheme can also be extended to research bidirectional partial generalized (lag, complete, and anticipated) synchronization between other dynamical systems.

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