Anti-Phase Synchronization of Complex Delayed Networks with Output Coupling via Pinning Control

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Abstract : Synchronization is a fundamental phenomenon that enables coherent behavior in networks as a result of interactions. The purpose of this research had been to investigate the problem of anti-phase synchronization for complex delayed dynamical networks with output coupling. The coupling configuration is general, with the coupling matrix not assumed to be symmetric or irreducible. The amount of the coupling variables between two connected nodes is flexible, the nodes in the drive and response systems need not to be identical and there is not any extra constraint on the coupling matrix. Some pinning controllers are designed to make the drive-response system achieve the anti-phase synchronization. For the convenience of description, we applied the matrix Kronecker product. Some new criteria are proposed based on the Lyapunov stability theory, linear matrix inequalities (LMI) and Schur complement. Lastly, some simulation examples are provided to illustrate the effectiveness of our proposed conditions.

Keywords : anti-phase synchronization, complex networks, output coupling, pinning control

Conference Title : ICAM 2015 : International Conference on Applied Mathematics

Conference Location : Bali, Indonesia

Conference Dates : October 11-12, 2015