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An internal model principle is necessary and sufficient for linear output synchronization.
(English) Zbl 1233.93011

Summary: Output synchronization of a network of heterogeneous linear state-space models under time-varying and directed interconnection structures is investigated. It is shown that, assuming stabilizability and detectability of the individual systems and imposing very mild connectedness assumptions on the interconnection structure, an internal model requirement is necessary and sufficient for synchronizability of the network to polynomially bounded trajectories. The resulting dynamic feedback couplings can be interpreted as a generalization of existing methods for identical linear systems.

MSC:

93A14	Decentralized systems
93C05	Linear systems in control theory

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Keywords:

synchronization; consensus; internal model principle; multi-agent systems; weak couplings

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