

Clustering and Synchronization in an Array of Repulsively Coupled Phase Oscillators

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Abstract: Clustering and synchronization in an array of repulsively coupled phase oscillators are numerically investigated. It is found that oscillators are divided into several clusters according to the symmetry in the structure. Synchronization occurs between oscillators in each cluster, while those oscillators belonging to different clusters remain asynchronous. Such synchronization may collapse for all clusters when the dynamics of only one oscillator is altered properly. The synchronous state may return back after a short period of transient process. This is determined by the strength of the oscillator altered. Its application in the communication of one-to-several is suggested.

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Key words: phase oscillators, clustering, synchronization

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