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Generalized synchronization of multidimensional chaotic systems in terms of symbolic CTQ-analysis

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Abstract. A new approach is proposed to the analysis of generalized synchronization of multidimensional chaotic systems. The approach is based on the symbolic analysis of discrete sequences in the basis of a finite T-alphabet. In fact, the symbols of the T-alphabet encode the shape (the geometric structure) of a trajectory of a dynamical system. Investigation of symbolic sequences allows one to diagnose various regimes of chaos synchronization, including generalized synchronization. The characteristics introduced allow one to detect and study the restructuring and intermittency behavior of attractors in systems (the time structure of synchronization). The measure of T-synchronization proposed is generalized without restrictions to complex ensembles of strongly nonstationary and nonidentical large-dimensional oscillators with arbitrary configuration and network (lattice) topology. The main features of the method are illustrated by an example.

Keywords: Chaotic systems, Generalized synchronization, Attractor's structure, Intermittency of synchronism, Symbolic CTQ-analysis.

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