The synchronization of two four-dimensional chaotic systems with cubic nonlinearities

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The importance of synchronization reveals both in the practical applications that can be obtained and also in the many phenomena that can be explained by synchronization theory. In biology and medicine many systems can be modeled as oscillators or vibratory systems and those systems show a tendency towards synchronous behavior. Since 1990 chaos synchronization has been a topic of great interest as shows the most comprehensive bibliography on chaos control and synchronization. Synchronization is a fundamental process in coupled dynamical systems. This means to design a controller or interconnections that guarantee synchronization of the multi-composed systems with respect to certain desired functional. In this work a simple feed-back method of control is used to study the synchronization for two chaotic four-dimensional systems. The method offers a precise coupling for two identical oscillators. Our results show that the transient time until synchronization depends on initial conditions of two systems and on the control strength. The synchronization is fast (about 3 unities of time) when four control strengths were applied to synchronize the two identical four-dimensional systems with cubic nonlinearities (Qi system), and the initial conditions of the two systems are very closed. The graphics of MATLAB soft is used to present the synchronization of these chaotic systems.