HACETTEPE ÜNİVERSİTESİ MATEMATİK BÖLÜMÜ SEMİNERLERİ

ANALYTICAL PERIODIC MOTIONS IN TIME-DELAYED SYSTEMS

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Özet

In this talk, the analytical dynamics of periodic flows and chaos in nonlinear dynamical systems is presented from the ideas of Luo (2012). The analytical solutions of periodic flows and chaos in autonomous systems are discussed through the generalized harmonic balance method, and the analytical dynamics of periodically forced nonlinear dynamical systems is presented as well. The analytical solutions of periodic solutions in free and periodically forced vibration systems are presented. The similar ideas are extended to time-delayed nonlinear systems. The analytical solutions of periodic flows to chaos for time-delayed, nonlinear systems with/without periodic excitations are presented, and time-delayed vibration systems will be also discussed. The analytical solutions of periodic flows and chaos are independent of the small parameters, which are different from the traditional perturbation methods. The methodology presented herein will provide the accurate analytical solutions of periodic motions to chaos in dynamical systems with/without time-delay. This approach can be handle nonlinear dynamical systems with either single time-delay or multiple time-delays.