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Study on Slow-Fast Motions in Dynamical Systems

In this talk, we present a method to analyze certain slow-fast motions in dynamical systems. For singular perturbed dynamical systems, the well-known Geometric Singular Perturbation Method (GSPM) is usually applied to find the special limit cycles – slow-fast periodic solutions. However, many practical problems might be not able or very difficult to be put in the form of singular perturbed equations, but they still exhibit slow-fast motions. For such cases, based on dynamical system theory, we developed a method to identify and analyze certain slow-fast motions. We will use several biological examples to illustrate our method, and give a comparison between the GSPM and our method.