A Geometric Approach to Exponentially Small Splitting Phenomena

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Abstract

In this talk, I will present a geometric and dynamical-systems-based method for exponentially small splitting phenomena within the context of unfoldings of real-analytic zero-Hopf bifurcations. I will consider the generic co-dimension two case, where our approach improves existing results, but also degenerate cases with higher co-dimension. As a novel aspect, we relate the exponential splitting to the lack of analyticity of invariant manifolds of generalized saddle-nodes. The blowup method plays an important technical role as a systematic way to relate dynamics on different orders of magnitude. Moreover, as our approach takes place in the (complexified) phase space, we do not rely on explicit time-parametrizations of the unperturbed heteroclinic connections.