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Dynamics near a periodically forced robust heteroclinic cycle

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Abstract

There are few explicit examples in the literature of non-autonomous vector fields exhibiting complex dynamics that may be proven analytically. In this talk, we present a careful analysis of the rich dynamics generated by a family of periodic perturbations of a weakly attracting robust heteroclinic network defined on the two-sphere. We derive the first return map near the "ghost" of the heteroclinic cycle and we reduce the non-autonomous system to a two-dimensional map. According to the magnitude of two small parameters, the associated flow may behave periodically, quasi-periodically or chaotically, depending on the specific character of the perturbation. We

also provide a bifurcation study of the periodic solutions that emerge and coalesce near the robust cycle when the parameters vary. We reduce the study of the dynamics to other configurations where the dynamics is known [1, 2, 3]. This is a joint work with Isabel Labouriau (University of Porto) – see [4].

Keywords: periodic forcing, heteroclinic cycle, global attractor, bifurcations, stability.

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