

ON THE DYNAMICS OF HOMOCLINIC TANGLES

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In this talk, we present some important aspects of a recent theory that offers a comprehensive characterization of dynamics of strange attractors associated to periodically forced homoclinic loop to a dissipative saddle. We illustrate, through numerical experiments, that, for a family of periodically forced systems, the pattern of dynamical behavioral, which include strange attractors dominated by sinks, Hénon-like, and rank one attractors, repeats itself periodically with respect to $\ln \mu^{-1}$ as $\mu \rightarrow 0$ where μ is the magnitude of the forcing applied. It is shown that the findings of the numerical experiments and the expectations of the theory are in great agreement.

Keywords: Homoclinic tangle, Periodically perturbation, Ordinary differential equations, Chaos

- [1] Q.D. Wang and Ali Oksasoglu, "Dynamics of Homoclinic Tangles in Periodically Perturbed Second Order Equations", *J. Diff. Eq.*, 250 (2011), 710-751.
- [2] Q.D. Wang and Ali Oksasoglu, "Periodic Occurrence of Dynamical Behavior of Homoclinic Tangles", *Physica D*, 239(7) (2010), 387-395.
- [3] Q.D. Wang and W. Ott, "Dissipative Homoclinic Loops of Two-Dimensional Maps and Strange Attractors with One Direction of Instability", *CPAM* 64(11) (2011) 1439-1496