ORAL COMMUNICATION

Construction of quasi-simple heteroclinic cycles

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Abstract

Robust heteroclinic cycles are invariant sets that can appear as attractors in constrained dynamical systems. These cycles may have a complicated structure determined to a large extent by the dimension of the system. As they are of great interest as models of biological and cognitive processes, it is useful to understand how their realisation between states in phase space leads to different dynamical behaviours. We discuss the construction of building blocks of *quasi-simple heteroclinic cycles* in $\mathbb{R}^n$ such that nodes lie on coordinate axes and heteroclinic connections are contained in coordinate planes. We examine the geometry of the generated quasi-simple heteroclinic cycles according to the type of their connections and discuss their stability properties. We illustrate our results with cycles in a game of Rock-Scissors-Paper-Lizard-Spock in [1].

Keywords Heteroclinic cycle; heteroclinic network; dynamics; stability

References

[1] S.B.S.D. Castro, A. Ferreira, L. Garrido-da-Silva and I.S. Labouriau: *Stability of cycles in a game of Rock-Scissors-Paper-Lizard-Spock*, SIAM Journal on Applied Dynamical Systems **21 (4)**, 2393–2431(2022).