Stability of one-dimensional heteroclinic connections

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Abstract

A lot of information on the stability of heteroclinic cycles is obtained from the value of the stability index along each connection of the cycle. The stability index provides information about the size of the local basin of attraction at a point along a connection and, since it is constant along trajectories, reflects the stability of that connection. Although the definition of stability index is generic, it has only been calculated for the very particular simple cycles of types A, B and C. We establish a way of obtaining the stability index for generic cycles whose connections are 1-dimensional and such that the dynamics near the connections are close to the identity. This includes all cycles of type Z as well as many cycles arising in population dynamics. We illustrate our results with two types of non-simple cycles, including a cycle present in the Rock-Scissors-Paper game.

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