Wagemakers, Alexandre; **Daza, Alvar**; **Sanjuán, Miguel A. F.**
The saddle-straddle method to test for Wada basins. (English) Zbl 1452.37030
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Summary: First conceived as a topological construction, Wada basins abound in dynamical systems. Basins of attraction showing the Wada property possess the particular feature that any small perturbation of an initial condition lying on the boundary can lead the system to any of its possible outcomes. The saddle-straddle method, described here, is a new method to identify the Wada property in a dynamical system based on the computation of its chaotic saddle in the fractalized phase space. It consists of finding the chaotic saddle embedded in the boundary between the basin of one attractor and the remaining basins of attraction by using the saddle-straddle algorithm. The simple observation that the chaotic saddle is the same for all the combinations of basins is sufficient to prove that the boundary has the Wada property.

MSC:

37C75 Stability theory for smooth dynamical systems
37C70 Attractors and repellers of smooth dynamical systems and their topological structure
37C45 Dimension theory of smooth dynamical systems

Keywords:

Wada basins; fractalized phase space; basins of attraction

Software:

Dynamics

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