

Practical global surfaces for the restricted three-body problem

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Abstract:

The restricted three-body problem is a classical problem with rich dynamics. An important tool to understand these dynamics is a global surface of section, which allows one to reduce a flow to a discrete dynamical system. Classically, such a global surface of section was used by Poincaré, Birkhoff and many others in special cases of this problem. On the other hand, holomorphic curve techniques developed by Hofer, Wysocki and Zehnder can be used to construct global surfaces for many more cases of the restricted three-body problem. We discuss how these methods can be implemented numerically and describe other practical constructions.