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Jacobi stability for geometric dynamics. (English) Zbl 1130.37014

Summary: Section 1 explains the origin of Jacobi stability. Section 2 introduces the Kosambi-Cartan-Chern theory for second-order differential systems of \( n \) equations with \( n \) unknown functions underlying the geometric roots. Section 3 introduces the fifth differential invariants associated to geometric dynamics and analyzes the Jacobi stability of geometric dynamics. Section 4 gives the basic ideas of the stability analysis of the linearized geometric dynamics of a given flow and shows that this Lyapunov stability is different from the Jacobi stability.

MSC:

37C75 Stability theory for smooth dynamical systems
37J25 Stability problems for finite-dimensional Hamiltonian and Lagrangian systems
53C22 Geodesics in global differential geometry
37D25 Nonuniformly hyperbolic systems (Lyapunov exponents, Pesin theory, etc.)

Keywords:
KCC theory; geodesics; deviation; curvature tensor; differential invariants; second-order differential equations

Full Text: DOI

References:

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