

Perturbation to Symmetries and Adiabatic Invariants of Nonholonomic Dynamical System of Relative Motion

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Abstract: Based on the theory of symmetries and conserved quantities, the exact invariants and adiabatic invariants of nonholonomic dynamical system of relative motion are studied. The perturbation to symmetries for the nonholonomic dynamical system of relative motion under small excitation is discussed. The concept of high-order adiabatic invariant is presented, and the form of exact invariants and adiabatic invariants as well as the conditions for their existence are given. Then the corresponding inverse problem is studied.

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Key words: nonholonomic dynamical system of relative motion, perturbation, exact invariant, adiabatic invariant

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