Exact Invariants and Adiabatic Invariants of Raitzin's Canonical Equations of Motion for Nonholonomic System of Non-Chetaev's Type

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Abstract: The exact invariants and the adiabatic invariants of Raitzin's canonical equations of motion for the nonholonomic system of non-Chetaev's type are studied. The relations between the invariants and the symmetries of the system are established. Based on the concept of higher order adiabatic invariant of mechanical system with the action of a small perturbation, the form of the exact invariants and adiabatic invariants and the conditions for their existence are proved. Finally, the inverse problem of the perturbation to symmetries of the system is studied and an example is also given to illustrate the application of the results.

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