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The time-reparameterization method for Noether’s quasi-symmetry theorems. (Chinese. English summary) [Zbl 1389.70012]

Summary: The time-reparameterization method is proposed and applied to prove Noether’s theorems of quasisymmetry and conserved quantity. Firstly, based on the infinitesimal group of transformations without transforming time, Noether’s quasi-symmetry theorems for Lagrange systems and Hamilton systems are given. Secondly, Noether’s quasi-symmetry theorems for Lagrange systems and Hamilton systems under the general infinitesimal group of transformations with transforming time are given by using the time-reparameterization method. Finally, two examples are provided to illustrate the application of the results.

MSC:
70H33 Symmetries and conservation laws, reverse symmetries, invariant manifolds and their bifurcations, reduction for problems in Hamiltonian and Lagrangian mechanics

Keywords:
time-reparameterization; Noether’s theorem; quasi-symmetry; Lagrange system; Hamilton system