

Noether Symmetry Can Lead to Non-Noether Conserved Quantity of Holonomic Nonconservative Systems in General Lie Transformations

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Abstract: For the holonomic nonconservative system, by using the Noether symmetry, a non-Noether conserved quantity is obtained directly under general infinitesimal transformations of groups in which time is variable. At first, the Noether symmetry, Lie symmetry, and Noether conserved quantity are given. Secondly, the condition under which the Noether symmetry is a Lie symmetry under general infinitesimal transformations is obtained. Finally, a set of non-Noether conserved quantities of the system are given by the Noether symmetry, and an example is given to illustrate the application of the results.

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Key words: holonomic conservative system, Noether symmetry, non-Noether conserved quantity, general infinitesimal transformations of groups

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