

## On Form Invariance, Lie Symmetry, and Three Kinds of Conserved Quantities of Generalized Lagrange's Equations

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**Abstract:** In this paper, the form invariance and the Lie symmetry of Lagrange's equations for nonconservative system in generalized classical mechanics under the infinitesimal transformations of group are studied, and the Noether's conserved quantity, the new form conserved quantity, and the Hojman's conserved quantity of system are derived from them. Finally, an example is given to illustrate the application of the result.

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**Key words:** form invariance, Lie symmetry, conserved quantity, generalized classical mechanics, Lagrange's equation

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