

## Symmetry Reduction, Exact Solutions, and Conservation Laws of (2+1)-Dimensional Burgers Korteweg-de Vries Equation

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**Abstract:** Using the classical Lie method of infinitesimals, we first obtain the symmetry of the (2+1)-dimensional Burgers-Korteweg-de-Vries (3D-BKdV) equation. Then we reduce the 3D-BKdV equation using the symmetry and give some exact solutions of the 3D-BKdV equation. When using the direct method, we restrict a condition and get a relationship between the new solutions and the old ones. Given a solution of the 3D-BKdV equation, we can get a new one from the relationship. The relationship between the symmetry obtained by using the classical Lie method and that obtained by using the direct method is also mentioned. At last, we give the conservation laws of the 3D-BKdV equation.

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**Key words:** 3D-BKdV equation, classical Lie method, direct method, conservation laws

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