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Symmetry reductions of the (3 + 1)-dimensional modified Zakharov-Kuznetsov equation. (English) [Zbl 1458.35376]

Summary: This paper is concerned with the symmetry reductions of the (3 + 1)-dimensional modified Zakharov-Kuznetsov equation of ion-acoustic waves in a magnetized plasma. The direct symmetry method is applied to determine the symmetry and the corresponding vector field. Then, the considered equation is reduced to lower-dimensional equations with the aid of the obtained symmetry. At last, some exact solutions of the modified Zakharov-Kuznetsov equation are found in terms of the lower-dimensional equations.

MSC:
35Q53 KdV equations (Korteweg-de Vries equations)
35Q51 Soliton equations
35C08 Soliton solutions
37K10 Completely integrable infinite-dimensional Hamiltonian and Lagrangian systems, integration methods, integrability tests, integrable hierarchies (KdV, KP, Toda, etc.)
37K40 Soliton theory, asymptotic behavior of solutions of infinite-dimensional Hamiltonian systems

Keywords:
Zakharov-Kuznetsov equation; direct symmetry method; symmetry reduction

Full Text: DOI

References:
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The text also includes a few comments or notes at the end, which provide additional context or information about the references or the document's content. These notes might discuss the reliability of the information, the relevance of the references, or other aspects pertinent to the document.

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