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Approximate symmetries, conservation laws and numerical solutions for a class of perturbed linear wave type system. (English) Zbl 1427.76197

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Summary: The present work considers the Lie group analysis of a system of linear wave type perturbed systems. The methodology is based on finding approximate symmetry operators of a given system. Approximate conservation laws are found via an approximate version of Noether's theorem. This is based on the modified Noether's method provided by Ibragimov. Finally a numerical method is applied to solve the considered system.

MSC:

- 76M60** Symmetry analysis, Lie group and Lie algebra methods applied to problems in fluid mechanics
- 35A30** Geometric theory, characteristics, transformations in context of PDEs
- 35Q35** PDEs in connection with fluid mechanics
- 34L16** Numerical approximation of eigenvalues and of other parts of the spectrum of ordinary differential operators

Cited in 1 Document

Keywords:

approximate symmetry; approximate conservation laws; Noether's theorem; non-linear self-adjointness; Legendre polynomials

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