

论文

一些非线性发展方程的显式行波解

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摘要:

该文给出了一种构造非线性发展方程显式行波解的方法并用该方法得到了Hirota-Satsuma方程组,一类非线性常微分方程以及广义耦合标量场方程组的显式行波解.

关键词: 行波解 非线性发展方程; Hirota-Satsuma方程组; 广义耦合标量场方程组

分类号:

35Q53; 35Q72

Explicit Traveling Wave Solutions for Some Nonlinear Evolution Equations

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Abstract:

A method to construct the traveling wave solutions to non linear evolution equations is presented. The explicit solutions of the Hirota-Satsuma equations, a class of nonlinear ordinary differential equation and the generalized coupled scalar field equations are obtained by using the method.

Keywords: Traveling wave solution Nonlinear evolution equation Hirota-Satsuma equation; Generalized nonlinear coupled scalar field equations.

收稿日期 修回日期 网络版发布日期

DOI:

基金项目:

国家自然科学基金(10171088)和江苏省教委自然科学基金(01KJB110008)资助

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参考文献:

[1] Ablowitz M J, Zeppefella A. Explicit solutions of Fisher's equation for a special wave speed. Bull Math Biol, 1979, 41: 835-840

[2] Abdelkader M A. Traveling wave solutions for a generalized Fisher equation. J Math Anal Appl, 1982, 85: 287-290

[3] Wang M L, Zhou Y B, Li Z B. Application of a homogeneous balance method to exact solutions of nonlinear equations in mathematical physics. Phys Lett A, 1996, 216: 67-75

[4] Lu B Q, Qu B Z, Pan Z L, Jiang X F. Exact traveling wave solution of the one class of nonlinear diffusion equations. Phys Lett A, 1993, 175: 113-115

[5] Liu C P, Zhou R G, Zhou M R. A simple method to construct the traveling wave solutions to nonlinear evolution equations. Phys Lett A, 1998, 246: 113-116

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▶ 非线性发展方程; Hirota-Satsuma方程组;

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[6]Fan E G, Zhang H Q. New exact solutions to a system of coupled Kdv equations. Phys Lett A, 1998, 245:389-392

[7]Wang M X, Xiong S L,Ye Q X. Explicit wave front solutions of Noyes Field systems for the Belousov Zhabotinskii reaction.J Math Anal Appl,1994,182:705-717

[8]Lu H J, Wang M X. Exact solutions of some nonlinear physical models. Phys Lett A, 1999, 255: 249-252

[9]Liu S K, et al. A simple fast method in finding particular solutions of some nonlinear PDE. Appl Math and Mechanics, 2001, 22: 326-331

[10]Hirota R, Satsuma J. Soliton solutions of a coupled Kdv equation. Phys Lett A, 1981, 85: 407-416

[11]Wadati M. Wave propagation in nonlinear lattic. J Phys Soc Jan, 1975, 38: 673-680

[12]Jaulent M, Miodek K. Nonlinear evolution equations associated with energy dependent Schrodinger potentials. Lett Math Phys, 1976, 1: 2 43-250

[13]Sachs R L. On the integrable variant of the Boussinesq system: Painlevé property, rational solutions,a related many body system,and equivalence with the AKNS hierarchy. Physica D, 1988,30: 1-6

[14]刘春平. 一类非线性耦合方程组的孤子解. 物理学报, 2000,49: 1904-1908

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