

Ganji, D. D.; Rafei, M.

Solitary wave solutions for a generalized Hirota-Satsuma coupled KdV equation by homotopy perturbation method. (English) Zbl 1160.35517

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Summary: He's homotopy perturbation method (HPM), which does not need small parameter in the equation is implemented for solving the nonlinear Hirota-Satsuma coupled KdV partial differential equation. In this method, a homotopy is introduced to be constructed for the equation. The initial approximations can be freely chosen with possible unknown constants which can be determined by imposing the boundary and initial conditions. Comparison of the results with those of Adomian's decomposition method has led us to significant consequences. The results reveal that the HPM is very effective, convenient and quite accurate to systems of nonlinear equations. It is predicted that the HPM can be found widely applicable in engineering.

MSC:

35Q53 KdV equations (Korteweg-de Vries equations)

Cited in **120** Documents

Keywords:

homotopy perturbation method; Helmholtz equation; FKdV equation; nonlinear partial differential equations

Full Text: [DOI](#)

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