

**Javidi, M.; Golbabai, A.**

**Exact and numerical solitary wave solutions of generalized Zakharov equation by the variational iteration method.** (English) Zbl 1350.35182

Chaos Solitons Fractals 36, No. 2, 309-313 (2008).

Summary: Exact and numerical solutions are obtained for the generalized Zakharov equation (GZE) by the well known variational iteration method (VIM). This method is based on Lagrange multipliers for identification of optimal values of parameters in a functional. Using this method creates a sequence which tends to the exact solution of the problem.

**MSC:**

[35Q55](#) NLS equations (nonlinear Schrödinger equations)

[35A25](#) Other special methods applied to PDEs

[35Q51](#) Soliton equations

Cited in **25** Documents

**Full Text:** [DOI](#)

**References:**

- [1] Zakharov, V.E., Collapse of Langmuir waves, Zh eksp teor fiz, 62, 1745-1751, (1972)
- [2] Golman, Mv., Langmuir wave solitons and spatial collapse in plasma physics, Physica D, 18, 67-76, (1986)
- [3] Nicolson, D.R., Introduction to plasma theory, (1983), Wiley New York
- [4] Li, L.H., Langmuir turbulence equations with the self-generated magnetic field, Phys fluids B, 5, 350-356, (1993)
- [5] Malomed, B.; Anderson, D.; Lisak, M.; Quiroga-Teixeiro, M.L., Dynamics of solitary waves in the Zakharov model equations, Phys rev E, 55, 962-968, (1977)
- [6] He, J.H., Application of homotopy perturbation method to nonlinear wave equations, Chaos, solitons & fractals, 26, 3, 695-700, (2005) · [Zbl 1072.35502](#)
- [7] He, J.H.; Wu, X.H., Construction of solitary solution and compacton-like solution by variational iteration method, Chaos, solitons & fractals, 29, 1, 108-113, (2006) · [Zbl 1147.35338](#)
- [8] He, J.H., Variational iteration method – a kind of nonlinear analytical technique: some examples, Int J nonlinear mech, 34, 4, 699-708, (1999) · [Zbl 1342.34005](#)
- [9] He, J.H., Variational iteration method for autonomous ordinary differential systems, Appl math comput, 114, 2-3, 115-123, (2000) · [Zbl 1027.34009](#)
- [10] Odibat, Z.M.; Momani, S., Application of variational iteration method to nonlinear differential equations of fractional order, Int J nonlinear sci numer simul, 7, 1, 27-36, (2006) · [Zbl 1401.65087](#)
- [11] Bildik, N.; Konuralp, A., The use of variational iteration method, differential transform method and Adomian decomposition method for solving different types of nonlinear partial differential equations, Int J nonlinear sci numer simul, 7, 1, 65-70, (2006) · [Zbl 1401.35010](#)
- [12] Momani, S.; Abuasad, S., Application of he's variational iteration method to Helmholtz equation, Chaos, solitons & fractals, 27, 5, 1119-1123, (2006) · [Zbl 1086.65113](#)
- [13] Soliman, A.A., Numerical simulation of the generalized regularized long wave equation by he's variational iteration method, Math comput simul, 70, 2, 119-124, (2005) · [Zbl 1152.65467](#)
- [14] Abdou, M.A.; Soliman, A. A., Variational iteration method for solving burger's and coupled burger's equations, J comput appl math, 181, 2, 245-251, (2005) · [Zbl 1072.65127](#)
- [15] Kaya, D.; El-Sayed, S.M., A numerical simulation and explicit solutions of the generalized burger-Fisher equation, Appl math comput, 152, 403-413, (2004) · [Zbl 1052.65098](#)
- [16] He JH. Non-perturbative methods for strongly nonlinear problems, Berlin: dissertation. de-Verlag im Internet GmbH, 2006.
- [17] He, J.H., Some asymptotic methods for strongly nonlinear equations, Int J modern phys B, 20, 10, 1141-1199, (2006) · [Zbl 1102.34039](#)
- [18] Abulwafa, E.M.; Abdou, M.A.; Mahmoud, A.A., The solution of nonlinear coagulation problem with mass loss, Chaos, solitons & fractals, 29, 2, 313-330, (2006) · [Zbl 1101.82018](#)
- [19] He, J.H., Approximate solution of nonlinear differential equations with convolution product nonlinearities, Comput meth appl mech eng, 167, 1-2, 69-73, (1998) · [Zbl 0932.65143](#)
- [20] He, J.H., Approximate analytical solution for seepage flow with fractional derivatives in porous media, Comput meth appl

mech eng, 167, 1-2, 57-68, (1998) · [Zbl 0942.76077](#)

- [21] He, J.H., Variational theory for linear magneto-electro-elasticity, *Int J nonlinear sci numer simul*, 2, 4, 309-316, (2001) · [Zbl 1083.74526](#)
- [22] Inokuti, M.; Sekine, H.; Mura, T., General use of the Lagrange multiplier in nonlinear mathematical physics, (), 56-162
- [23] Wang, M.; Li, X., Extended  $\textit{F}$ -expansion method and periodic wave solutions for the generalized Zakharov equations, *Phys lett A*, 343, 48-54, (2005) · [Zbl 1181.35255](#)
- [24] Marinca, V., An approximate solution for one-dimensional weakly nonlinear oscillations, *Int J nonlinear sci numer simul*, 3, 2, 107-120, (2002) · [Zbl 1079.34028](#)
- [25] Draganescu, G.E.; Capalnasan, V., Nonlinear relaxation phenomena in polycrystalline solids, *Int J nonlinear sci numer simul*, 4, 3, 219-225, (2003)
- [26] Soliman, A.A., A numerical simulation and explicit solutions of KdV-burgers' and lax's seventh-order KdV equations, *Chaos, solitons & fractals*, 29, 2, 294-302, (2006) · [Zbl 1099.35521](#)

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