

Ierley, Glenn; Spencer, Brian; Worthing, Rodney

Spectral methods in time for a class of parabolic partial differential equations. (English)

Zbl 0758.65064

J. Comput. Phys. 102, No. 1, 88-97 (1992).

The authors propose a fully spectral solution for the equation $u_t + uu_x + au_{xx} + bu_{xxx} + cu_{xxxx} = 0$ using a Fourier expansion in x and a Chebyshev expansion in t .

Reviewer: J.D.P.Donnely (Oxford)

MSC:

- 65M70 Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs
35K50 Systems of parabolic equations, boundary value problems (MSC2000)

Cited in 18 Documents

Keywords:

spectral methods; nonlinear parabolic equations; Fourier expansion; Chebyshev expansion

Full Text: [DOI](#)

References:

- [1] ()
- [2] Patera, A., J. comput. phys., 54, 468, (1984)
- [3] Benney, D.J., J. math. phys., 45, 150, (1966)
- [4] Kawahara, T., Phys. rev. lett., 51, 381, (1983)
- [5] Toh, S.; Kawahara, T., J. phys. soc. jpn, 54, 1257, (1985)
- [6] Kawahara, T.; Takaoka, M., Physica D, 39, 43, (1989)
- [7] Elphick, C.; Ierley, G.; Regev, O.; Spiegel, E.A., Phys. rev. A, 44, 1110, (1991)
- [8] Channell, P.J.; Scovel, C., Nonlinearity, 3, 231, (1990)
- [9] Hyman, J.M.; Nicolaenko, B.; Zaleski, S., Physica D, 23, 265, (1986)
- [10] Basdevant, C.; Deville, M.; Haldenwang, P.; Lacroix, J.M.; Ouzzani, J.; Peyret, R.; Orlandi, P.; Patera, A.T., Comput. fluids, 14, 23, (1986)
- [11] Gottlieb, D.; Orszag, S., Numerical analysis of spectral methods, (1977), SIAM Philadelphia
- [12] Haidvogel, D.; Zang, T., J. comput. phys., 30, 167, (1979)
- [13] Morchoisne, Y., Spectral methods for partial differential equations, (), 240
- [14] Tal-Ezer, H., SIAM J. numer. anal., 23, 11, (1986)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.