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Linear barycentric rational method for solving Schrödinger equation. (Linear barycentric rational method for solving Schrodinger equation.) (English) Zbl 07433077

Summary: A linear barycentric rational collocation method (LBRCM) for solving Schrödinger equation (SDE) is proposed. According to the barycentric interpolation method (BIM) of rational polynomial and Chebyshev polynomial, the matrix form of the collocation method (CM) that is easy to program is obtained. The convergence rate of the LBRCM for solving the Schrödinger equation is proved from the convergence rate of linear barycentric rational interpolation. Finally, a numerical example verifies the correctness of the theoretical analysis.

MSC:
65M70 Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs
35Q55 NLS equations (nonlinear Schrödinger equations)

Full Text: DOI

References:

[1] Feng, B. H.; Chen, R. P.; Liu, J. Y., Blow-up criteria and instability of normalized standing waves for the fractional Schrödinger-Choquard equation, Advances in Nonlinear Analysis, 10, 1, 331-330 (2021) · Zbl 1447.35291
[3] Liu, Y. L.; Li, X.; Chao, J., Multiplicity of concentrating solutions for a class of magnetic Schrödinger-Poisson type equation, Advances in Nonlinear Analysis, 10, 1, 131-151 (2021) · Zbl 1440.35138

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