

**Wu, Lixin**

**Dufort-Frankel-type methods for linear and nonlinear Schrödinger equations.** (English)

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SIAM J. Numer. Anal. 33, No. 4, 1526-1533 (1996).

This is a very clear paper which considers the use of the Dufort-Frankel methods for the discretization of nonlinear Schrödinger equations. These methods are explicit and combine the advantages of both the Crank-Nicolson and the Euler schemes. A proof of the uniqueness of the solution of the nonlinear equation is given which also leads to a conservation law. The chosen discretization schemes also have this conservation law which leads to greater reliability. Numerical examples are given.

Reviewer: [B.Burrows](#) (Stafford)

**MSC:**

- [65N06](#) Finite difference methods for boundary value problems involving PDEs
- [65N12](#) Stability and convergence of numerical methods for boundary value problems involving PDEs
- [35J10](#) Schrödinger operator, Schrödinger equation
- [35Q55](#) NLS equations (nonlinear Schrödinger equations)

Cited in **16** Documents

**Keywords:**

[numerical examples](#); [Crank-Nicolson method](#); [Euler method](#); [Dufort-Frankel methods](#); [nonlinear Schrödinger equations](#)

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