

Symplectic Computation of the Nonlinear Schrödinger Equation

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We apply explicit and implicit symplectic integrators to the nonlinear Schrödinger equation, and we demonstrate that they are able to produce accurate results and to preserve very well the invariants of the original system, such as the energy, the charge and the momentum. The convergence of the formal energies of the symplectic integrators is also checked numerically.