

Energy preserving method for nonlinear Schrödinger equations

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The Schrödinger equation is at heart of Bose Einstein Condensates with the celebrated Gross Pitaevskii equation. Such dispersive partial differential equations have many preserved quantities such as the mass, the energy or the momentum. It is therefore crucial to build numerical schemes that preserve these invariants. I will review in this talk some ways to perform numerical integration in time of nonlinear Schrödinger equations and will focus on energy preserving method for various nonlinearities. I will present the pros and cons of the various methods.

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