

Stuart, C. A.

Lectures on the orbital stability of standing waves and application to the nonlinear Schrödinger equation. (English) [Zbl 1179.37101](#)

[Milan J. Math.](#) 76, 329-399 (2008).

This tutorial (or mini-monograph) deals with orbital stability of the standing waves viewed as solutions of the form $e^{t\lambda A}\varphi$, $\lambda \in \mathbb{R}$, $\varphi \in X$, of some infinite dimensional Hamiltonian system, X being an infinite dimensional space. The theory is applied to the case of the nonlinear Schrödinger equation whose standing waves are time-harmonic. The problems discussed are: the Hamiltonian system and its invariance, sufficient stability conditions for orbital stability of a standing wave, constrained minimization and stability, the nonlinear Schrödinger equation, the nonlinear Schrödinger equation with a power law nonlinearity.

Reviewer: [Vladimir Răsvan \(Craiova\)](#)

MSC:

- [37K45](#) Stability problems for infinite-dimensional Hamiltonian and Lagrangian systems
- [37-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to dynamical systems and ergodic theory
- [35Q55](#) NLS equations (nonlinear Schrödinger equations)

Cited in **24** Documents

Keywords:

[orbital stability](#); [Hamiltonian system](#); [nonlinear Schrödinger equation](#)

Full Text: [DOI Link](#)