

Wang, Chenglin; Zhang, Jian

Strong instability of solitary waves for inhomogeneous nonlinear Schrödinger equations.

(English) [Zbl 1479.35828](#)

[Math. Methods Appl. Sci. 44, No. 18, 14632-14642 \(2021\).](#)

Summary: This paper studies the inhomogeneous nonlinear Schrödinger equations, which may model the propagation of laser beams in nonlinear optics. Using the cross-constrained variational method, a sharp condition for global existence is derived. Then, by solving a variational problem, the strong instability of solitary waves of this equation is proved.

MSC:

[35Q55](#) NLS equations (nonlinear Schrödinger equations)

[35B30](#) Dependence of solutions to PDEs on initial and/or boundary data and/or on parameters of PDEs

[35A15](#) Variational methods applied to PDEs

[35C08](#) Soliton solutions

[35B35](#) Stability in context of PDEs

[35A01](#) Existence problems for PDEs: global existence, local existence, non-existence

[78A60](#) Lasers, masers, optical bistability, nonlinear optics

Keywords:

[inhomogeneous nonlinear Schrödinger equation; instability; sharp condition; variational problem; solitary wave](#)

Full Text: [DOI](#)