Buslaev, V. S.; **Perel'man, G. S.**

On the stability of solitary waves for nonlinear Schrödinger equations. (English)

Zbl 0841.35108
Uraltseva, N. N. (ed.), Nonlinear evolution equations. Providence, RI: American Mathematical Society. Transl., Ser. 2, Am. Math. Soc. 164 (22), 75-98 (1995).

The paper is devoted to the stability problem for the nonlinear Schrödinger equation

$$i\vec{\psi}_t = [-\partial_x^2 + V(\psi_1\psi_2)]\sigma_3\vec{\psi},$$

where $\vec{\psi} = \binom{\psi_1(x,t)}{\psi_2(x,t)}$, $\sigma_3 = \left(\begin{smallmatrix} 1 & 0 \\ 0 & -1 \end{smallmatrix}\right)$ and V is a real-valued function with

$$V(\xi) \geq -V_1\xi^q, \quad V_1 > 0, \quad \xi \geq 1, \quad q < 2,$$
$$V(\xi) = V_2\xi^p(1 + O(\xi)), \quad p > 0, \quad \xi \to 0.$$

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For the entire collection see [Zbl 0824.00037].

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MSC:

35Q55 NLS equations (nonlinear Schrödinger equations)
35Q51 Soliton equations

Keywords:

linearization; solitons