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Chiral nonlinear Schrödinger equation. (English) Zbl 0932.35190

Chaos Solitons Fractals 9, No. 7, 1063-1069 (1998).

Summary: A nonlinear evolution equation

$$i\psi_t + \psi_{xx} - i\lambda(\psi^*\psi_x - \psi\psi_x^*)\psi = 0,$$

which we name the chiral nonlinear Schrödinger (CNLS) equation is studied. The CNLS equation has two kinds of progressive wave solutions; bright soliton for $\lambda v > 0$ and dark soliton for $\lambda v < 0$, where v is the velocity of the envelope. The bright soliton corresponds to the particle while the dark soliton is interpreted as the hole.

MSC:

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

[37K40](#) Soliton theory, asymptotic behavior of solutions of infinite-dimensional Hamiltonian systems

Cited in **9** Documents

Keywords:

[progressive wave solutions](#); [bright soliton](#); [dark soliton](#)

Full Text: [DOI](#)

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