Density of neutral solitons in weakly disordered Peierls chains.

Mostovoy M, Figge MT, Knoester J (1998) Density of neutral solitons in weakly disordered Peierls chains. *Physical Review B* 57(5), 2861-2871.

Abstract

We study the effects of weak off-diagonal disorder on Peierls systems with a doubly degenerate ground state. We show that for these systems disorder in the electron hopping amplitudes induces a finitedensity ofsolitons in the minimal-energy lattice configuration of a single chain. These disorder-induced dimerization kinks are neutral and have spin 1/2. Using a continuum model for the Peierls chain and treating the lattice classically, we analytically calculate the average free energy and density of kinks. We compare these results to numerical calculations for a discrete model and discuss the implications of the kinks for theoptical and magnetic properties of the conjugated polymer *trans*-polyacetylene.

Beteiligte Forschungseinheiten

Angewandte Systembiologie Marc Thilo Figge Mehr erfahren

Leibniz-HKI-Autor*innen

Marc Thilo Figge

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