

Magnetic susceptibility due to disorder-induced neutral solitons in interacting polymer chains.

Figge MT, Mostovoy M, Knoester J (1999) Magnetic susceptibility due to disorder-induced neutral solitons in interacting polymer chains. *Physical Review B* 59(21), 13882-13891.

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Abstract

We study the magnetic response due to neutral solitons induced by disorder in polymer materials. We account for interchain interactions, which, if sufficiently strong, result in a bond-ordered phase, in which the neutral solitons are bound into pairs. We analytically calculate the corresponding pair size distribution. As the spins of the solitons have a distance dependent antiferromagnetic coupling, this allows us to calculate the magnetic susceptibility in the ordered phase. At low temperatures, the result deviates from the usual Curie behavior in a way that depends on the relative strength of the disorder and the interchain interactions. We compare our results to the observed magnetic susceptibility of *trans*-polyacetylene and we suggest new experiments extending towards lower temperatures.

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