

Peierls instability due to the interaction of electrons with both acoustic and optical phonons in metallic carbon nanotubes.

Figge MT, Mostovoy M, Knoester J (2002) Peierls instability due to the interaction of electrons with both acoustic and optical phonons in metallic carbon nanotubes. *Physical Review B* 65(12), 125416.

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Abstract

We consider Peierls instability due to the interaction of electrons with both acoustic and optical phonons in metallic carbon nanotubes, resulting in a static twist in the nanotube lattice below the critical temperature T_c . We study lattice excitations, the so-called solitwiston and polartwiston, over the ordered Peierls state for different types of boundary conditions. Furthermore, we calculate the electrical resistivity and find that our theory offers a possible explanation for the observed low-temperature rise in the electrical resistivity of carbon nanotubes.

Beteiligte Forschungseinheiten

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