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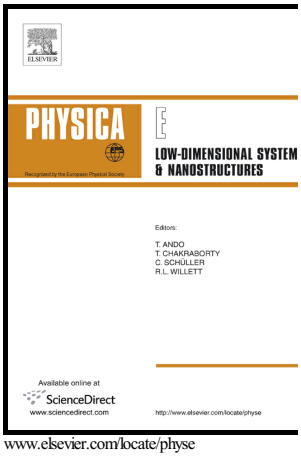

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The influence of edge defects on the electrical and thermal transport of graphene nanoribbons

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Abstract

The electrical conductance, thermopower, thermal conductance and figure of merit of graphene nanoribbons (GNRs) are investigated using Green function formalism in the linear response regime. The Hamiltonian of GNR is described by the tight-binding approach and the effect of elastic interactions due to the electron-electron interaction or the thermal environmental fluctuations is considered by dephasing approach within the self-consistent Born approximation. The results show that the dephasing process leads to the reduction of the electrical transport of GNRs. Since the edge configuration of GNRs has the significant role in their electronic properties, it is shown that the electrical and thermal transports of the GNRs are decreased by the edge defects while the reduction of thermal conductance is more efficient, therefore, the thermal efficiency of GNRs is increased.

Keywords: Graphene nanoribbon; Thermoelectric properties; Edge defect; Dephasing.

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