

Abstract Submitted
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Thermal conductivity of isolated and interacting carbon nanotubes¹ DAVIDE DONADIO, GIULIA GALLI, UC Davis — We have investigated the thermal conductivity of single wall carbon nanotubes (SWCNT) either isolated or in contact with external media, by using equilibrium molecular dynamics and the Boltzmann transport equation². We show that, contrary to existing controversies, both methods yield a finite value of the thermal conductivity for infinitely long tubes, as opposed to the case of 1D momentum conserving systems³. Acoustic and flexure modes with mean free paths of the order of a few micron, as observed also in experiments⁴, are identified as major contributors to the high value of SWCNT conductivity. We also find that the interaction with an external medium may substantially decrease the lifetime of the low frequency vibrations, reducing the thermal conductivity by up to two orders of magnitude.

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²Chantrenne *et al.* J. Appl. Phys. **97**, 104318 (2005).

³O. Narayan and S. Ramaswamy, Phys. Rev. Lett. **89**, 200601 (2002).

⁴C. Yu, *et al.* Nano Lett. **5**, 1842 (2005).

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