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Double-wall carbon nanotube quasi-ballistic conduction HISASHI KAJIURA, University of Illinois and Sony Corporation, HOUJIN HUANG, Sony Corporation, ALEXEY BEZRYADIN, University of Illinois, UNIVERSITY OF ILLINOIS COLLABORATION, SONY CORPORATION COLLABORATION —
We demonstrated room-temperature quasi-ballistic electron conduction in double-wall carbon nanotubes (DWNTs) produced using a modified arc-discharge method [1]. Conductance dependence on the length of DWNT was measured by submerging the sample into liquid mercury. The conductance versus length plots show plateaus, indicating weak dependence of the electrical resistance of the DWNTs on the length of the nanotubes segment connecting electrodes. We infer a mean free path between 0.6 – 10 micron meter for 80% of the tubes, which is in good agreement with the results of calculations based on the electron scattering by acoustic-phonons and by disorder. [1] H. Kajiura et al. Chem Phys Lett 398(2004)476-9.

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