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Contact Resistance in Metallic Carbon Nanotube Devices
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— Transport in metallic single-walled carbon nanotubes (m-SWNT) is of fundamental interest because of their 1D nature and strong electron-phonon coupling. To probe intrinsic transport properties contact resistance has to be minimized. Transparent contacts have already been achieved for rather large diameter tubes (d>2nm). For smaller diameter m-SWNT it is not clear whether this is possible or if there is a lower bound for the contact resistance. Here we investigate the two probe resistance of m-SWNT in the diameter range d=1.0-1.4nm. m-SWNT have been assembled onto predefined Palladium electrodes by low frequency dielectrophoresis. We observe that device resistance can be significantly reduced by current-induced annealing. Insight into the nature of the process is given by electron transport and correlated photocurrent and Raman spectroscopy measurements.

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