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Measurement of intrinsic resistivity of individual single walled carbon nanotubes with known-chirality MITSUHIDE TAKEKOSHI, VIKRAM DESHPANDE, ZHENGYI ZHANG, Columbia University, YUHEI MIYAUCHI, Kyoto University, TONY HEINZ, JAMES HONE, PHILIP KIM, Columbia University — We report the electrical resistivity measured on individual single walled nanotubes (SWNTs) whose atomic structures are characterized by Rayleigh and Raman spectroscopy. Since electrical transport of SWNTs on substrates is predominantly limited by surface polar phonon from substrate at elevated temperatures, intrinsic transport properties of SWNTs limited by nanotube phonons remained to be probed experimentally. Here we present electrical transport measurement of long suspended individual SWNTs with exactly assigned atomic structures. SWNTs are grown by the chemical vapor deposition method on pre-patterned electrodes and their exact chiral indices are obtained using Rayleigh and Raman spectroscopy. We investigate temperature dependent resistivity of metallic SWNTs in the diffusive regime. We will discuss the chirality dependence of the electron-acoustic phonon interaction inferred from the temperature dependent intrinsic resistivity of SWNTs.

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