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Electron transport in as-grown suspended semiconducting carbon nanotubes VIKRAM DESHPANDE, MARC BOCKRATH, Applied Physics, CalTech — Recently it was reported [1] that as-grown suspended single-walled carbon nanotubes (SWNTs) contacted with Pt or Mo leads afford devices that are devoid of perturbations due to substrate interaction and relatively defect-free. Previously, low-resistance contacts to semiconducting SWNTs have been obtained with Au [2], since the work-function of Au aligns with the valence band of the SWNTs creating ohmic contacts in the p-type region. We present fabrication of as-grown SWNTs with Au contacts, to fully exploit this behavior. We discuss electron transport in semiconducting devices obtained as above, with the aim of understanding the role of electron interactions in transport. Metallic SWNTs are known to exhibit Luttinger liquid behavior as is evident in the power-law dependence of conductance and density of states in a tunneling experiment [3]. We explore Luttinger liquid behavior in devices obtained using our fabrication technique. We will present latest experiments and inferences. [1] Cao et al, Nature Materials (2005) [2] Yaish et al, PRL (2004) [3] Bockrath et al, Nature (1999)

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