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Luttinger liquid parameters of carbon nanotubes from first-principles calculations BORIS KOZINSKY, LEONID LEVITOV, NICOLA MARZARI, Massachusetts Institute of Technology — Electron interactions in carbon nanotubes are responsible for particle correlations which manifest themselves in a power-law suppression of the density of states observed in tunneling transport. The Tomonaga-Luttinger model, which describes the behavior of 1d metals at low energy, links the power law exponents to the microscopic parameters, interaction strength and Fermi velocity. These exponents have been measured in recent experiments [1]. Motivated by these findings, we employ density functional theory methods to estimate charge compressibility and Fermi velocity, and thereby obtain the Tomonaga-Luttinger model parameters in the charge sector [2]. Our calculations are in quantitative agreement with experimental results and previous RPA calculations [3]. [1] M. Bockrath et al., *Nature* 397, 598 (1999); Z. Yao et al., *Nature* 402, 273 (1999); H. Ishii et al. *Nature* 426, 540 (2003). [2] B. Kozinsky et al. (to be published). [3] R. Egger, A. O. Gogolin, *Phys. Rev. Lett.* 79, 5082 (1997).

Boris Kozinsky
Massachusetts Institute of Technology

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