

Abstract Submitted
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Electronic transport at van Hove Singularities in a large diameter carbon nanotube¹ YANFEI YANG, GEORGY FEDOROV, Physics department, Georgetown University, SERHII SHAFRANIUK, Physics and Astronomy Department, Northwestern University, RUPERT LEWIS, BENJAMIN COOPER, CHRISTOPHER LOBB, Physics department, University of Maryland, PAOLA BARBARA, Physics department, Georgetown University — Carbon nanotube field-effect transistors (CNFET) with high transparency contacts show maxima of differential conductance at zero bias voltage [1]. These zero-bias anomalies (ZBAs) occur at large negative gate voltages and in narrow gate voltage ranges. Here we report on observation of pronounced ZBAs in devices made with a large diameter nanotube, at values of gate voltages corresponding to van Hove singularities of the nanotube density of states. We report the modulation of ZBAs by Fabry-Perot oscillations and distinct characterizations of these effects at low temperature and in magnetic field. Our proposed explanation is superconductivity in the nanotubes, occurring when the gate voltage shifts the Fermi level into van Hove singularities of the electronic density of states [1].

[1] J. Zhang, A. Tselev, Y. Yang, K. Hatton, P. Barbara, S. Shafraniuk, Phys. Rev. B, **74**, 155414 (2006).

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