Abstract Submitted for the MAR07 Meeting of The American Physical Society

Microwave shielding of transparent and conducting SWNT films¹ HUA XU, STEVEN ANLAGE, Center for Superconductivity Research, Department of Physics, University of Maryland, College Park, MD 20742-4111, LIANGBING HU, GEORGE GRUNER, Department of Physics, University of California, Los Anleges, CA 90095 — Single-walled carbon nanotubes (SWNTs) are emerging as building blocks of electronics for a variety of applications. In particular, films of nanotubes have found potential applications for electronics and optoelectronics. The transport properties of SWNT films in the microwave frequency range from 10 MHz to 30 GHz was measured by using the Corbino reflection technique from temperatures 20 K to 400 K. Based on the real and imaginary parts of the microwave conductivity, we calculated the shielding effectiveness for various film thickness. Shielding effectiveness of 43 dB at 10 MHz and 28 dB at 10 GHz is found for films with 90% optical transmittance, which suggests that SWNT films are promising as a new type of transparent microwave shielding material. By combining our data with those from the literature, the conductivity of SWNT films was established in a broad frequency range from DC to visible.

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