

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Pressure-induced superconductivity in thin films of boron-doped carbon nanotubes JUNJI HARUYAMA, JIN NAKAMURA, Aoyama Gakuin Univ., JASON REPERT, APPARAO RAO, Clemson Univ., HIROTAKA SANO, YASUHIRO IYE, Tokyo university — We have reported that thin films of slightly boron-doped single-walled carbon nanotubes (B-SWNTs) can be superconductor at T_c of 12K [1]. Here, based on this, we show creation of paperlike thin film (Buckypaper) consisting of pseudo-two-dimensional network of B-SWNTs within weakly intertube van der Waals coupling (IVDWC) state. It was formed by sufficiently dissolving as-grown ropes of B-SWNTs and densely assembling them on silicon substrate. We find that superconducting transition temperature T_c of 8 K under absent pressure can be induced up to 19 K by applying a small pressure to the film and that a frequency in the radial breathing phonon drastically increases with applying pressure [2]. Discussion about IVDWC and distribution of B-SWNTs diameter imply the strong correlation. References [1] N. Murata, J. Haruyama, J. Reppert, A. M. Rao, T. Koretsune, S. Saito, Phys. Rev. Lett. 101, 027002 (2008) [2] J. Nakamura, J. Haruyama, M. Tachibana, J. Reppert, A. Rao, H. Sano, Y. Iye et al., Appl.Phys.Lett. 95, 142503 (2009)

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Date submitted: 20 Nov 2009

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