Abstract Submitted
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Superconductivity in thin films of boron-doped carbon nanotubes[1] J. HARUYAMA, N. MURATA, Aoyama Gakuin Univ., J. REPPERT, A. RAO, Clemson Univ., T. KORETSUNE, S. SAITO, Tokyo Institute of Technology — It is well known that the small mass of carbon can promote high transition temperature (T_c) in BCS-type superconductivity (SC). Recently, new carbon-based superconductors with order of T_c of $\sim$10K [1, 2] were discovered and higher T_c has been expected. In particular, the SC in a carbon nanotube (CNT) is attracting considerable attention [3]. We reported that entirely end-bonded multi-walled CNTs could show SC with T_c = 12K, previously [4]. In contrast, it had problem in reproducibility, because correlation with carrier doping was not clarified. Moreover, none has succeeded substitutional carrier doping into CNTs and also revealed the correlation with SC. Here, we report on the Meissner effect found in thin films consisting of assembled boron-doped single-walled CNTs [5]. We reveal that only highly homogeneous CNT films consisting of low boron concentration leads to evident Meissner effect with T_c = 12 K. The first-principles electronic-structure study of the *B*-SWNT strongly supports these results. [1] T. E. Weller et al., *Nature Physics* 1, 39 (2005), [2] E. A. Ekimov et al., *Nature* 428, 542 (2004), [3] M. Kociak et al., *Phys. Rev. Lett.* 86, 2416 (2001), [4] I. Takesue, J.Haruyama, et al., *Phys. Rev. Lett.* 96, 057001(2006), [5] N.Murata, J.Haruyama, et al., *Phys.Rev.Lett.* 101, 027002 (2008)

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