Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetization drops in arrays of superconductive multi-walled carbon nanotubes J. HARUYAMA, N. MURATA, Aoyama Gakuin University, E. EINARSSON, S. CHIASHI, S. MARUYAMA, Tokyo University, N. KISHI, T. SUGAI, H. SHINOHARA, Nagoya University — Superconductivity in CNT, which is an ideal one-dimensional (1D) conductor, is attracting significant attention, because it allows one to study how Cooper pairs can be generated and behave in 1D space within a ballistic charge transport regime. This study also reveals interplay between superconductive phase and phases of 1D quantum phenomena, which tend to prevent superconductivity from its appearance (e.g., Tomonaga-Luttinger liquid states and Pierls transition). We have recently reported finding of superconductivity with the highest Tc of 12 K for abrupt resistance drops in arrays of MWCNTs by entirely end-bonding those by gold electrode [1]. Here, I will report finding of magnetization drops with the highest Tc of 18K, which is greater than the above-mentioned Tc of 12K, in the arrays of MWCNTs. Because only the samples with showing resistance drops can exhibit this magnetization drips, we conclude that this is attributed to Meissner effect. Based on this observation, we clarify that contribution of graphite structure of a MWNT is a dominant mechanism for the present Meissner effect rather than influence of curvature. We also reveal contribution of intertube coupling in an array of MWCNTs. [1] I.Takesue, J.Haruyama. et al., Phys.Rev.Lett. 96, 057001 (2006)

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Date submitted: 20 Nov 2006 Electronic form version 1.4