

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Correlated enhancement of H_{c2} and J_c in carbon nanotube-doped MgB_2 . M. JAIME, MPA-NHMFL, LANL, Los Alamos, NM 87544, A. SERQUIS, G. SERRANO, S. MORENO, CAB, Bariloche, Argentina, L. CIVALE, B. MAIOROV, MPA-STC, LANL, Los Alamos, NM 87544, F. BALAKIREV, MPA-NHMFL, LANL, Los Alamos, NM 87544 — We achieved simultaneous enhancement of upper critical magnetic field, H_{c2} , and critical current density, J_c , by doping polycrystalline samples of MgB_2 with double-wall carbon nanotubes (DWCNT), a source of atomic carbon. The optimum DWCNT content from the point of view of the J_c is in the range 2.5-10% at depending on field and temperature. Record values for H_{c2} (4K) = 41.9 T (with extrapolated $H_{c2}(0) \approx 44.4$ T) are reached in a bulk sample with 10% at DWCNT content. The measured H_{c2} vs T in all samples are successfully described using a theoretical model for a two-gap superconductor in the dirty limit first proposed by Gurevich *et al.*

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Date submitted: 01 Dec 2006

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