

Abstract Submitted
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Search for Superconductivity in Carbon Nanotubes Doped by Boron Ion Implantation NICHOLAS CORNELL, ALEX KUTSENOV, AUSTIN HOWARD, NATHANIEL MAYO, EDUARD GALSTAYAN, WEI KAN CHU, HERBERT FREYHARDT, ANVAR ZAKHIDOV, XUEMEI WANG, UNIVERSITY OF TEXAS AT DALLAS TEAM, UNIVERSITY OF HOUSTON TEAM — The boron doping of single wall carbon nanotubes(CNT) by laser ablation synthesis has been reported to create superconducting B-CNTs with T_c 's ranging from 12-19 Kelvin, depending on CNT inter-tube connection strength. We attempt to create boron doped multiwall CNT by ion implantation doping. Ion doping of boron(B) was performed at 60keV and 20keV, and low temperature transport combined with SQUID and ESR/LFMA was used in searching for SC. We have found that $R(T)$ strongly depends on the metallic contact geometry. With thin film contacts on CNT sheets the $R(T)$ shows no SC signatures, while when an Ag or Au paste penetrates the highly porous network of B doped multiwall CNT then $R(T)$ drops and curvature changes are observed resembling SC transitions with T_c depending on B concentration and metallic electrode distances. We discuss these results in terms of possible SC in hybride “metal-CNT” system in which metal was predicted to suppress phase fluctuation in one dimensional CNT network [1].

[1] Erez Berg, Dror Orgad, and Steven A. Kivelson, Phys. Rev. B 78, 094509(2008)

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