

Abstract Submitted
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Superconductivity of multi-walled carbon nanotubes E. PERFETTO, J. GONZALEZ, Instituto de Estructura de la Materia (CSIC), Madrid, Spain — We investigate the superconductivity of multi-walled carbon nanotubes, paying attention to the balance between the Coulomb interaction and the effective e - e interaction mediated by phonon-exchange. Our main aim is to confront the recent observation of sharp transitions in the resistance of multi-walled nanotubes, in situations where most part of the shells are electrically active [1]. For this purpose we will adapt the mechanism already shown for the superconductivity of nanotube ropes, where the electrostatic coupling among a large number of nanotubes leads to a drastic reduction of the Coulomb interaction [2]. We will consider in particular the interaction and Cooper-pair tunneling among a large number of shells in the multi-walled nanotubes, drawing a connection between the superconductivity of these structures and the more conventional one in the intercalated compounds of graphite.

[1] I. Takesue *et al.*, to appear in Phys. Rev. Lett.

[2] J. González, Phys. Rev. Lett. **88**, 076403 (2002); J. V. Alvarez and J. González, Phys. Rev. Lett. **91**, 076401 (2003).

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