

Abstract Submitted
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Magnetic impurities and Kondo conductance anomalies in nanotubes: the importance of being “in”¹ ERIO TOSATTI, SISSA and ICTP, Trieste, PIERPAOLO BARUSELLI, SISSA Trieste, MICHELE FABRIZIO, SISSA and ICTP, Trieste — Transition metal impurities should yield zero bias anomalies in the conductance of well contacted metallic carbon nanotubes, but relevant temperatures and lineshapes cannot be anticipated without accurate *ab initio* calculations. Applying the density functional plus numerical renormalization group approach of Lucignano et al [1] to Co and Fe impurities in (4,4) and (8,8) nanotubes, we discover a huge difference of behaviour between outside versus inside impurity adsorption. The predicted Kondo temperatures and zero bias anomalies, tiny when the impurity is outside the nanotube [2] turn large and strongly radius dependent inside, owing to a change of symmetry of the magnetic orbital. These results foreshadow interesting field and temperature dependent nanotube electrical transport, to be addressed in future experiments.

[1] P. Lucignano, et al., Nature Materials 8, 563 (2009).

[2] P. Baruselli, et al., Physica E (2011) doi:10.1016/j.physe.2011.05.005

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