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SU(4) Kondo effect in carbon nanotube quantum dots RAMON AGUADO, Condensed Matter Theory, ICMM, CSIC, MAHN-SOO CHOI, Department of Physics, Korea University, ROSA LOPEZ, Physique Theorique, Universite de Geneve — We investigate theoretically the non-equilibrium transport properties of carbon nanotube quantum dots. Owing to the two-dimensional band structure of graphene, a double orbital degeneracy plays the role of a pseudo-spin, which is entangled with the spin. Quantum fluctuations between these four degrees of freedom result in an SU(4) Kondo effect at low temperatures. This exotic Kondo effect manifests as a four-peak splitting in the non-linear conductance when an axial magnetic field is applied [1]. Recent transport experiments in carbon nanotube quantum dots [2] clearly support our theoretical findings. [1] M. S. Choi, R. Lopez and R. Aguado, cond-mat/0411665 (2004). [2] P. Jarillo-Herrero, J. Kong, H. S. J. van der Zant, C. Dekker, L. P. Kouwenhoven and S. De Franceschi, to be published (2004).

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