

Abstract Submitted
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Kondo Physics in $4f$ metals: Gadolinium nanocontacts BERNAT OLIVERA, CARLOS UNTIEDT, University of Alicante (Spain), ELKE SCHEER, University of Konstanz (Germany) — The study of electron transport in conducting materials at the nanoscale can be carried out by using Scanning Tunneling Microscope (STM) and Mechanically Controllable Break Junction techniques (MCBJ).¹ At such scales, Kondo effect vanishes the magnetic properties of the $3d$ transition metals Fe, Co and Ni.² The $4f$ rare earth metals are an interesting aim of study because of their strong magnetic properties among other things. At our laboratories we have measured gadolinium with both STM and MCBJ techniques. In the spectroscopy measurements of this material we perceive a set of features that could be related to its magnetic properties. The interplay between the $4f^7$ and $5d^1$ orbitals from Gd drives us to pose the mechanisms that are involved in the electronic transport properties of these systems.

¹N. Agraït, A. Levy-Yeyati, J.M. van Ruitenbeek. Phys. Rep. 377 (2003), 81.

²M. R. Calvo *et al.*, Nature 458 (7242) (2009), 1150-1153.

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