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Spectral evolution of the SU(4) Kondo effect from the single impurity to the two-dimensional lattice ALEJANDRO LOBOS, Joint Quantum Institute and Condensed Matter Theory Center, Department of Physics, University of Maryland, College Park, Maryland, USA, MARCELO ROMERO, Instituto de Desarrollo Tecnológico para la Industria Química (INTEC-CONICET-UNL) Güemes 3450, Santa Fé, Argentina, ARMANDO ALIGIA, Centro Atómico Bariloche and Instituto Balseiro, Comisión Nacional de Energía Atómica, Bariloche, Argentina — We describe the evolution of the SU(4) Kondo effect as the dimensionality of the system is gradually increased from the zero-dimensional limit (i.e., impurity) to the two-dimensional (2D) lattice. We derive a Hubbard-Anderson model describing a 2D array of atoms or molecules with two-fold orbital degeneracy, acting as magnetic impurities and interacting with a metallic host. We calculate the differential conductance, observed typically in experiments of scanning tunneling spectroscopy, for different arrangements of impurities on a metallic surface: a single impurity, a periodic square lattice, and several sites of a rectangular cluster. Our results point towards the crucial importance of the orbital degeneracy and agree well with recent experiments in different systems of of iron(II) phtalocyanine molecules deposited on top of Au(111) [N. Tsukahara *et al.*, Phys. Rev. Lett. **106**, 187201 (2011)]. Our results indicate that this would be the first experimental realization of a 2D SU(4) Kondo-lattice system.

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