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Spin-polarized conductance in double quantum dots: Interplay of Kondo, Zeeman and orbital effects[1] LUIS DIAS DA SILVA, Instituto de Fisica, Universidade de Sao Paulo, EDSON VERNEK, Instituto de Fisica, Universidade Federal de Uberlandia, KEVIN INGERSENT, Department of Physics, University of Florida, NANCY SANDLER, SERGIO ULLOA, Department of Physics and Astronomy, and Nanoscale and Quantum Phenomena Institute, Ohio University — We study the effect of an external magnetic field in the Kondo regime of a double-quantum-dot system in which a strongly correlated dot is coupled to a noninteracting dot that is also connected to external leads. In zero field, the spectral function of the hanging dot has previously been shown to exhibit a split-peak structure near the Fermi level due to "Kondo resonance filtering" by the noninteracting dot. We show, using the numerical renormalization group, that application of a magnetic field leads to a subtle interplay between electronic interference, Kondo physics, and Zeeman splitting with nontrivial consequences for the spectral and transport properties. The value of the correlated-dot spectral function at the Fermi level exhibits a nonuniversal field dependence that can be explained using a generalized Friedel sum rule for a Kondo system with energy-dependent hybridization. By tuning gate voltages and the magnetic field, one can achieve complete spin polarization of the linear conductance between the leads, raising the prospect of applications of the device as a highly tunable spin filter.

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