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Numerical evidence of tunable long-range spin interactions between quantum dots G. MARTINS, Oakland Univ.-MI, E. ANDA, PUC-RJ-Brasil, K. AL-HASSANIEH, FSU - FL, C. BUSSER, A. MOREO, E. DAGOTTO, Univ. Tenn.-Knoxville — This work was motivated by experimental results (N. J. Craig *et al.*, Science **304**, 565 (2004)) where two quantum dots (QDs) are connected through an open conducting region. By varying the gate potentials, a net local spin is fixed in the first QD, and the Kondo effect in the second QD is then suppressed. By either varying the gate potential in the first QD, until its net spin is zero, or by decreasing its coupling to the common conducting region, the Kondo peak in the second QD can be restored. Combining Exact Diagonalization of finite clusters with a Dyson Equation embedding procedure, we were able to reproduce these results. Two qualitatively different regimes were found: (1) When the charge in the first QD has a value of approximately 1, the conductance in the second QD has a dip where it goes exactly to zero, resembling an interference effect already noticed in previous work.[1] (2) When the charge in the first QD is above or bellow 1, the Kondo effect can be suppressed, but the conductance does not vanish. Work is being done on a qualitative interpretation of these results, which do not seem to support an RKKY scenario. [1] C. A. Busser *et al.*, cond-mat/0404426 (Phys. Rev. B, in press)

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