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Influence of spin correlations in the transport properties of a double quantum dot system IGNACIO HAMAD, PUC Rio de Janeiro, 22452-970 , Brazil, LAERCIO COSTA RIBEIRO, Centro Federal de Educacao Tecnologica Celso Suckow da Fonseca (CEFET-RJ/UnED-NI), RJ, 26041-271, Brazil, GUILLERMO CHIAPPE, Departamento de Fisica Aplicada Universidad de Alicante, San Vicente del Raspeig, Alicant 03690, Spain, ENRIQUE VICTORIANO ANDA, PUC Rio de Janeiro, 22452-970 , Brazil — In this work we study the influence of spin correlations in the transport properties of a system consisting of two quantum dots (QDs) with high Coulomb interaction U which are interconnected through a chain of N non-interacting sites and individually coupled to two metallic leads. Using both the finite U slave boson mean field approach (FUSBMFA) and the Logarithmic-discretization-embedded-cluster approximation (LDECA) we studied the system in different regions of the parameter space for which we calculate many physical quantities, namely local density of states, conductance, total spin, spin correlations, in addition to the renormalization parameters associated with the FUSBMFA. The results reveled a very rich physical scenario which is manifested by at least two different Kondo regimes, the well-known spin s = 1/2 and some other type of Kondo effect which appears as a result of the coupling between the QDs and the non-interacting central sites. We also consider the possibility of accessing some kind of Kondo box effect due to the discrete nature of the central chain and study how this regime is affected by the magnetic interaction between the local spins of the QD's and by the interaction between these spins and the spins of the conduction electros in the leads.

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