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Kondo correlations and transport in single and triple quantum dots with damped lead hoppings: a tDMRG study.[1] LUIS DIAS DA SILVA, Oak Ridge Natl. Lab. and U. of Tennessee, FABIAN HEIDRICH-MEISNER, Inst. for Theoretical Physics C, RWTH Aachen, Germany, ADRIAN FEIGUIN, Microsoft Project Q, U. of California at Santa Barbara, ELBIO DAGOTTO, Oak Ridge Natl. Lab. and U. of Tennessee — We study the transport properties of one and three quantum dot systems with the time-dependent Density Matrix Renormalization-Group method (tDMRG). As previously noted [1,2], finite-size effects make the tDMRG description of the strongly interacting Kondo regime a numerically demanding task. We address this issue by introducing an exponential decay in the hopping terms in the leads ($t_n \propto \Lambda^{-n/2}$), recently introduced in cluster embedding methods [3]. For a given system size, results for $\Lambda > 1$ show several improvements over the undamped ($\Lambda = 1$)[1,2] case: the Kondo plateau in the differential conductance is correctly obtained deeper in the strongly interacting regime; steady-state current plateaus remain well defined for longer time scales. These results show that, with the proposed modification, the characterization of Kondo correlations in the transport properties can be substantially improved, at less computational cost. [1] K. A. Al-Hassanieh et al. PRB, 73, 195304 (2006). [2] F. Heidrich-Meisner et al. arxiv:0705.1801 (2007). [3] E. Anda et al., pre-print (Nov. 2007).

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