

Disorder in small dopant chains

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We study the effect of disorder (W) in strongly interacting small dopant chains. Using a slave-boson mean-field approximation we diagonalize the Hamiltonian via scattering matrix theory. We numerically solve the Kondo transmission and the mean-field parameters that give us a direct window to the Kondo temperature. We predict that Coulomb interactions (U) screen the disorder potential for $W < U$ and therefore the Kondo transmission increases with increasing interactions. We demonstrate that in the same regime $W < U$, disorder in the energy levels of the dopants induces disorder in the dopant chain couplings which is not screened. We find that this disorder in the couplings comes from a local distribution of Kondo temperatures in each dopant.