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Numerical Renormalization-Group computation of nuclear magnetic relaxation rates[1] KRISSIA ZAWADZKI[2], LUIZ N. OLIVEIRA[3], University of Sao Paulo, JOSÉ WILSON M. PINTO[4], Universidade Federal Amazonas — We report an essentially exact numerical renormalization-group (NRG) computation of the temperature-dependent NMR rate $1/T_1$ of a probe at a distance R from a magnetic impurity in a metallic host. We split the metallic states into two subsets, A and B. The former comprises electrons a_k in s-wave states about the magnetic-impurity site. The coupling between the a_k band and the impurity is described by the Anderson Hamiltonian, diagonalizable by the NRG procedure. Each state b_k in the B subset is a linear combination of an s-wave state about the probe site with the degenerate a_k, constructed to be orthogonal to all the a_k's. The b_k band hence decouples from the impurity and is analytically treatable. We show that the relaxation rate has three components: (i) a constant associated with the b_k's; (ii) a T-dependent term associated with the a_k's, which decays in proportion to $1/(k_F R)^2$, where k_F is the Fermi momentum; and (iii) another T-dependent term due to the interference between the a_k's and the b_k's. The interference term shows Friedel oscillations whose amplitude, proportional to $1/k_F R$, can be mapped onto the universal function of T/T_K describing the Kondo resistivity. We compare our findings with results in the literature.

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