Numerical Renormalization-Group computation of nuclear magnetic relaxation rates\textsuperscript{1} KRISSIA ZAWADZKI\textsuperscript{2}, LUIZ N. OLIVEIRA\textsuperscript{3}, University of Sao Paulo, JOSÉ WILSON M. PINTO\textsuperscript{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 $1/(k_FR)^2$, 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 $1/k_FR$, 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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