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Phase coherence of conduction electrons below the Kondo temperature¹ GASSEM M. ALZOUBI, NORMAN O. BIRGE, Department of Physics and Astronomy, Michigan State University, East Lansing, MI 48824-2320. — The scattering of conduction electrons by magnetic impurities is known as the Kondo effect. This effect has been the subject of theoretical and experimental investigations for several decades. Until very recently [1, 2], however, there was no theoretical expression for the temperature dependence of the inelastic scattering rate valid for temperatures T not too far below the Kondo temperature, T_K . We present experimental measurements of the phase decoherence rate, τ_ϕ^{-1} , of conduction electrons in disordered dilute AgFe Kondo wires [3]. We compare the temperature dependence of the magnetic scattering rate, γ_m , with a recent theory of dephasing by Kondo impurities [2]. A good agreement with theory is obtained for $T/T_K > 0.1$. At lower T , γ_m deviates from theory with a flatter T -dependence.

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[2] T. Micklitz, A. Altland, T. A. Costi, A. Rosch, Phys.Rev. Lett. 96, 226601 (2006).

[3] G.M. Alzoubi and N.O. Birge, Phys.Rev. Lett. in press (2006).

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