

Itinerant and localized magnetic correlations in URhGe and UGe₂

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Evidence for weak itinerant long-range magnetic correlations in the ferromagnetic superconductor UGe₂ was found from muon-spin-relaxation measurements six year ago (A. Yaouanc, Phys. Rev. Lett, **89**, 147001 (2002)). The interpretation of the data has been sometimes disputed on the ground that no signature of the localized magnetic component was found. Here measurements of the spin-lattice relaxation rate, λ_Z , for the ferromagnetic superconductor URhGe are reported. A study of the field dependence of λ_Z in the paramagnetic phase provides a signature of both the itinerant and the localized magnetic components. As expected, the field dependences of these two components are widely different. Therefore, the results obtained for URhGe support the interpretation of the UGe₂ data. Both compounds are characterized, in addition to the conventional localized component, by weak itinerant long-range magnetic correlations.

The recent availability of high pressure cells operating down to 0.35 K at PSI is particularly interesting for the ferromagnetic superconductors because their physical properties are strongly pressure dependent. In fact, it is sometimes argued that the pressure is the control parameter to reach the expected quantum critical point. The μ SR pressure response measured for UGe₂ is reported. We will discuss both the critical fluctuations and the spontaneous frequencies under pressure. The characteristic saturation of λ_Z as the critical temperature is approached from above is also observed at 0.95 (2) GPa. That saturation is a clear signature of the itinerant component.