

Eletron Spin Resonance (ESR) experiments of Fe-doped YbAlB₄ heavy fermion compounds

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Resumo

In this work we have performed Electron Spin Resonance (ESR) experiments on single crystals of Fe-doped YbAlB₄ heavy fermion compounds. We explored the ESR measurements in X-band ($\eta = 9,4$ GHz). For β -YbAlB₄, we have performed X-band experiments for single crystals and we found a remarkable ESR signal that behaves as a conduction electron spin resonance (CESR) at high temperatures and acquires characteristics of the Yb(3+) local moment ESR at low temperature. This behavior was not found in the α -YbAlB₄. The striking and unique dual behavior observed in the same ESR spectra of β -YbAlB₄ associated to the ESR results found for α -YbAlB₄ allowed us to propose a qualitative scenario that may explain the origin of the ESR signal in HF systems. We speculate that for HF systems a strongly coupled 4f and c-e give origin to "Kondo coupled ESR modes", which may behave as CESR or LM ESR, depending on the strength of $J_f s$. Moreover, HF systems near a QCP may have propitious conditions to present such a signal.