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Experimental observation of the spin screening effect in superconductor/ferromagnet thin film heterostructures

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Abstract

We have studied the nuclear magnetic resonance (NMR) of V51 nuclei in the superconductor/ferromagnet thin film heterostructures Pd1-xFex/V/Pd1-xFex and Ni/V/Ni in the normal and superconducting state. Whereas the position and shape of the NMR line in the normal state for the trilayers is identical to that observed in a single V layer, in the superconducting state the line shape definitely changes, developing a systematic distortion of the high-field wing of the resonance line. We consider this as the first experimental evidence for the penetration of ferromagnetism into the superconducting layer, a phenomenon which has been theoretically predicted recently and dubbed the spin screening effect. © 2009 The American Physical Society.

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