Upper critical field of p-wave ferromagnetic superconductors with orthorhombic symmetry

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The theory of the upper critical field in p-wave superconductors with broken symmetry[1] was found to quantitatively fit the experimental data obtained from the ferromagnetic superconductor URhGe with the magnetic field in all three crystal axis directions, assuming a completely broken symmetry state[2]. We have extended the Scharnberg-Klemm calculations to cases of partially broken symmetry in an orthorhombic crystal, as is appropriate for the more exotic superconductor UCoGe. For some partially broken symmetry cases, the upper critical field exhibits upward curvature, as has been recently seen in the ferromagnetic superconductor UCoGe,[3] and reasonably good fits to some of that data are obtained.

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