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Anomalous angular dependence of the upper critical induction of orthorhombic ferromagnetic superconductors with completely broken p -wave symmetry CHRISTOPHER LÖRSCHER, University of Central Florida, JINGCHUAN ZHANG, QIANG GU, University of Science and Technology Beijing, RICHARD KLEMM, University of Central Florida — We calculate the angular dependence of the upper critical field, $H_{c2}(\theta, \phi, T)$, for an orthorhombic ferromagnetic superconductor with a general ellipsoidal Fermi surface with effective masses m_1 , m_2 , and m_3 , in which we have p -wave parallel-spin pairing that is locked onto the z -axis direction. We report anomalous angular dependence of H_{c2} for fixed $3 < m_3 / (m_1 \cos^2 \phi + m_2 \sin^2 \phi)$, for which we observe a peak in H_{c2} for some angle $0^\circ < \theta^* < 90^\circ$, providing a sensitive test of the order parameter symmetry in materials such as URhGe. This technique can be generalized to other order parameter symmetries. We have also made relevant predictions about the angular dependence of H_{c2} for the low-field superconducting phase of URhGe.

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