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Superconducting and Pauli Paramagnetic Anisotropies in $TmNi_2B_2C$[1] M.R. ESKILDSEN, University of Notre Dame, P. DAS, Los Alamos National Laboratory, Z. WEEMS, C. RASTOVSKI, S.J. KUHN, University of Notre Dame, L. DEBEER-SCHMITT, K. LITTRELL, Oak Ridge National Laboratory, S.L. BUD'KO, Ames Laboratory, P.C. CANFIELD, Ames Laboratory and Iowa State University — A direct measure of the intrinsic superconducting anisotropy (Γ_{ac}) is difficult to obtain in materials where multiple bands contribute to the superconductivity or where H_{c2} is orbitally limited for one field direction and Pauli limited along another. We report on small-angle neutron scattering studies of the vortex lattice (VL) in $TmNi_2B_2C$ with fields applied along the basal plane. This material orders antiferromagentically and the magnetic and superconducting states are known to strongly influence each other, even in the paramagnetic phase above T_N. Our measurements allowed an independent determination of Γ_{ac} (through the VL anisotropy), and the magnetic-superconducting interaction anisotropy reflected in the Pauli paramagnetic effect (spin-polarization of unpaired quasiparticles in the vortex cores) on the VL scattered intensity (form factor).

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