

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Anisotropic properties of unconventional superconductors in a magnetic field: testing the nodal structure ANTON VORONTSOV, ILYA VEKHTER, Louisiana State University — We present a calculation of electronic specific heat and heat conductivity in a vortex state of quasi-two dimensional d-wave superconductors. We employ quasiclassical theory and use the Brand-Pesch-Tewordt approximation to model the superconducting state at moderate to high magnetic fields. Within this framework we investigate the dependence of heat capacity and heat conductivity on the angle of rotation of magnetic field with respect to the nodal directions. We find that the fourfold anisotropy due to nodal structure in both quantities changes sign in the temperature-field plane. This result helps resolve the apparent disagreement about the gap symmetry reached from the specific heat and the thermal conductivity measurements in CeCoIn₅. We comment on the physics behind the difference between our results and those obtained in the Doppler shift approximation.

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Date submitted: 04 Dec 2005

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