Scaling law of the thermal conductivity in nodal superconductors

H. WON, Dept. of Physics, Hallym University, Chuncheon 200-702, Korea, K. MAKI, Dept. of Physics and Astronomy, University of Southern California, Los Angeles, CA 90089-0484, USA — The scaling law of the thermal conductivity in d-wave superconductors in the vortex state has been considered by Simon-Lee[1] and Kübert-Hirschfeld[2]. Here we present simple expressions of κ_{xx} and κ_{xy} for a class of nodal superconductors in the clean limit (i.e. $\Gamma \ll v\sqrt{eH}$, $T \ll \Delta$ where Γ is the quasi-particle scattering rate, v the Fermi velocity of quasiparticle and T the temperature). When the above condition is satisfied, κ_{xx} and κ_{xy} are simple function of $v\sqrt{eH}/T$. The present result is compared with the recent thermal conductivity data of the heavy fermion superconductor $CePt_3Si$ by Izawa et al.
[1] S.H. Simon and P.A. Lee, PRL 78, 1548 (1997).
[2] C. Kübert and P.J. Hirschfeld, PRL 80, 4963 (1998).

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