Angle-dependent Shubnikov-de Haas quantum oscillation in the topological semimetal YPtBi

HYUNSOO KIM, HALYNA HODOVANETS, KE-FENG WANG, JOHNPIERRE PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park, MD 20742, USA — Noncentrosymmetric cubic YPtBi is a topological semimetal with strong spin-orbit coupling and resultant $j = 3/2$ conduction fermions that make this superconductor with $T_c = 0.8$ K the first candidate superfluid with high-spin (i.e. beyond spin-triplet) Cooper pairing. To develop a realistic pairing model, we investigate the Fermi surface geometry and fundamental properties of the nontrivial conduction fermions in YPtBi using temperature- and field-dependent quantum oscillations measurements of the angle-dependent Shubnikov-de Haas (SdH) oscillations. We will present our analysis of angle-dependent frequency and amplitude of the SdH oscillations, and discuss the details of the normal state Fermiology of this exotic system.

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