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Study of angle dependent magnetoresistance in half-Heusler YPtBi HYUNSOO KIM, KEFENG WANG, HALYNA HODOVANETS, JOHN-PIERRE PAGLIONE, Univ of Maryland-College Park — Semimetallic half-Heusler compounds (RTBi, R = rare earth, T = Pd, Pt) have been attracting much attention because multiple theoretical calculations predicted the topologically non-trivial band structure. However, the detail band structure near the Γ point depends on the specific calculation methods, and also the band structure inferred from experimental results show discrepancy from the theoretical one. Particularly in RPtBi (R=Y, Lu, Dy, Gd), the surface metallic states, which is absent in most of the theoretical results, were evident by recent ARPES measurements, but there has not been any detailed study on the metallic surface states. Moreover, the observation of topological nodal superconductivity in YPtBi makes the knowledge of Fermiology crucial to understand the pairing mechanism in the half-Heusler superconductors. Here, we present experimental results on angular dependence of magnetoresistance at various temperatures in single crystals of YPtBi. Based on observation of the angular dependence of Shubnikov-de Haas quantum oscillations, we discuss possible topologies of the bulk as well as the surface Fermi surfaces.

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