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Penetration depth and point-contact spectroscopy studies of exotic superconductivity in noncentrosymmetric half-Heusler YPtBi HYUNSOO KIM, STEVEN ZIEMAK, KEFENG WANG, YASUYUKI NAKAJIMA, JOHNPIERRE PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park, MD, USA, MAKARIY TANATAR, RUSLAN PROZOROV, Ames Laboratory, Department of Physics and Astronomy, Iowa State University, Ames, IA, USA — Strong asymmetric spin-orbit coupling in a noncentrosymmetric superconductor allows mixing of even and odd parity of the pairing interactions. Such an exotic pairing interaction has been suggested in some Pt-based noncentrosymmetric superconductors such as CePt₃Si and Li₂Pt₃B. More recently, we reported superconductivity below 0.8 K in YPtBi, a half-Heusler compound that lacks inversion symmetry. Here we present our studies of the superconducting energy gap in YPtBi using soft point contact spectroscopy and superconducting penetration depth measurements via tunnel diode resonator technique as a function of temperature and applied magnetic field. We will compare the morphology of our dI/dV energy gap spectra to previous theoretical and experimental results for triplet *p*-wave materials, and review our analysis of normalized superfluid density and theoretical current density and compare to various possible superconducting energy gap symmetries.

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