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Field-induced phase transitions in spin-orbit coupled superconductors[1] FLORIAN LODER, ARNO P. KAMPF, THILO KOPP, University of Augsburg — Spin-orbit coupling (SOC) or magnetic fields both split the otherwise degenerate spin eigenstates in metals. A pairing interaction may then lead to Cooper pairs which are either of intra- or of inter-band pairing type. These pairing states are separated by a first-order phase transition depending on the relative strength of SOC and the magnetic field [1]. We analyze this phase transition for a two-dimensional electron system in an in-plane magnetic field and show that the spin-triplet component of the superconducting order parameter reaches its maximum exactly at the phase transition. The superconducting energy gap closes at this transition and thereby allows for a change in the topological character of the superconductor. We suggest that this in-plane magnetic field driven transition is well suited for experimental detection because of the absence of orbital depairing effects.

[1] F. Loder *et al.*, J. Phys. Condens. Matter **25**, 362201 (2013)

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