

Seminar

Signatures of topological Josephson junctions

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Venue: w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Quasiparticle poisoning and diabatic transitions may significantly narrow the window for the experimental observation of the 4π -periodic *dc* Josephson effect predicted for topological Josephson junctions. Here, we show that switching current measurements provide accessible and robust signatures for topological superconductivity which persist in the presence of quasiparticle poisoning processes. Such measurements provide access to the phase-dependent subgap spectrum and Josephson currents of the topological junction when incorporating it into an asymmetric SQUID together with a conventional Josephson junction with large critical current. We also argue that pump-probe experiments with multiple current pulses can be used to measure the quasiparticle poisoning rates of the topological junction. The proposed signatures are particularly robust, even in the presence of Zeeman fields and spin-orbit coupling, when focusing on short Josephson junctions. Finally, we also consider microwave excitations of short topological Josephson junctions which may complement switching current measurements.

About the Speaker

Yang Peng obtained his BSc. degree in Material Chemistry from Peking University in 2012. He was a research student in FRITZ-HABER-INSTITUT DER MAX-PLANCK-GESELLSCHAFT in Berlin, Germany from 2012 to 2013. Since 2013, he has been doing PhD in Freie University Berlin. His research areas are Topological superconductivity and Majorana bound states.