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Detection of charge transfers in Cooper pair box CHIA-HENG SUN, PO-CHEN TAI, Department of Physics, National Central University, Jhongli, Taiwan, JHENG-AN JIANG, CEN-SHAWN WU, Department of Physics, National Changhua University of Education, Changhua, Taiwan, JENG-CHUNG CHEN, Department of Physics, National Tsing Hua University, Hsinchu, Taiwan, YUNG-FU CHEN, Department of Physics, National Central University, Jhongli, Taiwan — Cooper pair in a conventional superconductor (S) is composed of two spin-entangled electrons, and it may split into two non-superconductor (NS) regions via a process called crossed Andreev reflection. Such a spatially split entangled pair could be a quantum channel shared by two parties for quantum teleportation. However, several undesirable charge transfer processes are also involved at S/NS interfaces, such as quasi-particle tunneling, cotunneling, and ordinary Andreev reflection. In this poster we will discuss the importance of each charge transfer process in a system consisting of a superconducting island connected to two normal metal islands via two tunnel junctions, and inspect the efficiency of Cooper pair splitting in such scheme.

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