

Odd-frequency pairing state in superconducting junctions

Yukio Tanaka (Nagoya University)

We have theoretically studied the induced odd-frequency pairing states in ballistic normal metal/superconductor (N/S) junctions where a superconductor has even-frequency symmetry in the bulk. Using the quasiclassical Green's function formalism, we demonstrate that, quite generally, the pair amplitude in the junction has an admixture of an odd-frequency component due to the breakdown of translational invariance near the N/S interface [1]. We have also studied about the proximity effect in proximity effect in junctions between diffusive normal metals (DN) and superconductors. It is revealed when the superconductor has a spin-triplet state, the resulting symmetry in DN is always odd-frequency spin-triplet. The resulting quasi-particle density of state in DN has a zero energy peak. This unusual proximity effect due to the generation of odd- frequency state is also expected in ferro-magnet / superconductor junctions [4].

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