Cooper pair splitting in mesoscopic systems

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Abstract:

Nonlocal quantum entanglement in two-particle system is a key for applications on quantum communication, and has been demonstrated in optical systems. To realize nonlocal quantum entanglement in solid-state systems, methods of generating entangled pairs and separating the pairs are required. Cooper pairs in superconductors are great sources of entangled electron pairs, and lately spatial separation of Cooper pairs are demonstrated in several superconductor-based hybrid systems via a process called crossed Andreev reflection. In this talk I will talk about some recent progresses in Cooper pair splitting and discuss our approaches to tackle this subject.