

Charge tunneling events within hybridized triple quantum dots

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chains and scalable topological qubits in the future.

Towards the realization of topological quantum computation, dispersive gate sensing plays an important role for qubit readout, which enables characterization and further measurements of a quantum system in floating regime. In our work, we define a superconducting island in between two semiconducting quantum dots on an InAs nanowire. We investigate electron cotunneling between the quantum dots through the superconducting island, and observe cross Andreev reflections for several settings of the barrier gates. With multiplexing, we notice that the resonator signal from the middle island is less sensitive to the cotunneling events, while that from the outer dots is affected by all charge transitions. By analyzing the capacitance of various charge transitions, we explore the tunneling properties of the hybrid system. Our result will assist in the tuning of many-sites Kitaev