

Super-Semi Interferometers based on Quantum Point Contacts

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Two dimensional systems proximitized with superconductors have been demonstrated to serve as versatile platform for studying Andreev physics [1]. Here, we create several DC superconducting quantum interference devices generated by two semiconductor Josephson junctions. We probe the limits of balancing such a circuit – that is minimizing the difference of their respective Andreev energies towards creating a parity protected qubit [2]. Additionally, we inspect the quality of these super-semi proximitized modes via the transmission of superconducting quantum point contacts [3].

References

- [1] J. Shabani, et al. Phys. Rev. B. 93, 155402 (2016)
- [2] T.W. Larsen, et al. Phys. Rev. Lett. 125, 056801 (2020)
- [3] E. Mikheev, et al. Sci. Adv. 7, 40 (2021)

Figures

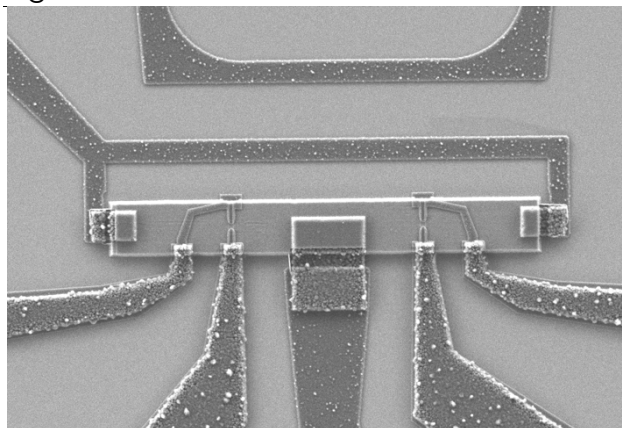


Figure 1: SEM of a hybrid interferometer with quantum point contacts and local flux control.

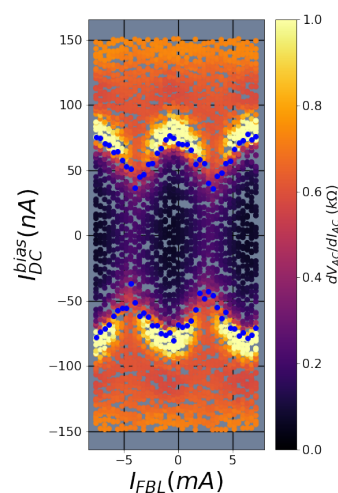


Figure 2: Oscillation of Josephson critical current as a function of local flux line current.