Investigation of graphene-based multi-terminal Josephson junctions

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The Andreev spectrum of an N-terminal Josephson junction is expected to host Weyl singularities in the (N-1)-dimensional space of the individual superconducting phases, thus mimicking the band structure of topological materials [1]. Here, we investigate a 3-terminal Josephson junction containing hBN-encapsulated graphene as the weak link connecting the terminals. We characterize the junction by DC transport measurements and apply RCSJ simulations to understand the multi-terminal behaviour [2-5]. Furthermore, we perform switching current distribution measurements to probe the switching mechanism in this multi-terminal system for the first time.

References

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[2] Gino V. Graziano, et al., Physical Review B, 101 (2020) 054510
[3] Natalia Pankratova et al., Physical Review X, 10 (2020) 031051
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Figures

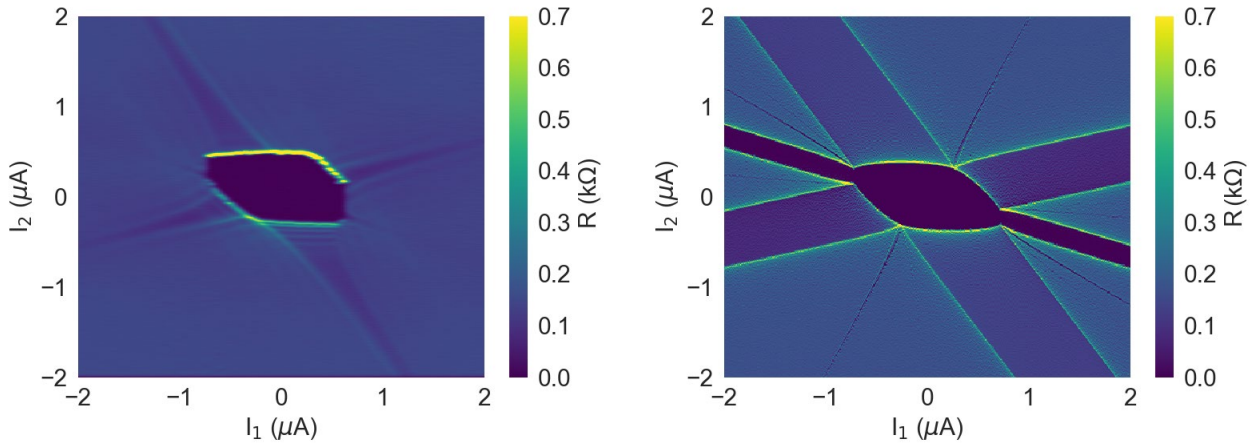

Figure 1: Differential resistance of a 3-terminal Josephson junction (measurement – left and simulation on the right)