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Critical Current Anomaly at the Topological Quantum Phase Transition in a Majorana Josephson Junction

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## Highlights

- We introduce the critical current step as a signal for the topological quantum phase transition.
- We study the quantum phase transition in the topological nanowire under a rotating Zeeman field.
- We investigate the results for multi-band systems, and show the critical current anomaly only appears for systems with few bands.

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