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Current phase relation in nanowire based Josephson junctions DANIEL SZOMBATI, STEVAN NADJ-PERGE, ATTILA GERESDI, VINCENT MOURIK, KUN ZUO, DAVID WOERKOM, Delft University of Technology, DIANA CAR, ERIK BAKKERS, Eindhoven University of Technology, LEO KOUWENHOVEN, Delft University of Technology — Junctions based on small band-gap nanowires are convenient platform for studying Josephson effect in the presence of strong spin-orbit coupling. As predicted by theory, due to the interplay between strong Zeeman interaction and large spin orbing coupling in these nanowires, the critical current and in particular current phase relation exhibits rich set of features in the presence of external magnetic field and electrostatic gating. We study supercurrent transport through Indium Antimonide nanowires contacted using Niobium-Titanium-Nitride leads using both current and phase bias measurements. Our results provide useful insights into superconductor/semiconductor hybrid systems capable of hosting Majorana fermions, potential building blocks for topological quantum computing.

> Daniel Szombati Delft University of Technology

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