

Abstract Submitted  
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**Supercurrents in InSb nanowire Josephson junctions** JUN CHEN, PENG YU, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA, 15260, USA, SÉBASTIEN PLISSARD, DIANA CAR, Department of Applied Physics, Eindhoven University of Technology, 5600 MB Eindhoven, The Netherlands, VINCENT MOURIK, KUN ZUO, DAVID VAN WOERKOM, DANIEL SZOMBATI, LEO KOUWENHOVEN, Kavli Institute of Nanoscience, Delft University of Technology, 2628CJ Delft, The Netherlands, ERIK BAKKERS, Department of Applied Physics, Eindhoven University of Technology, 5600 MB Eindhoven, The Netherlands, SERGEY FROLOV, Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh, PA, 15260, USA — Majorana fermions have been predicted in one-dimensional semiconductor nanowires with strong spin-orbit interactions coupled to superconductors. Effects such as odd number Shapiro steps disappearing and critical currents oscillating in magnetic field have been proposed as signatures of Majorana fermions in Josephson junctions. Here we investigate supercurrents in NbTiN-InSb nanowire-NbTiN Josephson junctions as a function of back gate and magnetic field. When an external magnetic field was applied along the nanowire, we observe gate-tunable oscillations in the critical current. To clarify the origin of this oscillating critical current, we are studying the spectra of Shapiro steps, which may give us a better understanding of such Josephson junctions and guide the search for additional signatures of Majorana fermions.

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