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Majorana modes in InSb nanowires (II): resolving the topological phase diagram HAO ZHANG, ÖNDER GÜL, MICHIEL DE MOOR, FOKKO DE VRIES, JASPER VAN VEEN, DAVID VAN WOERKOM, KUN ZUO, VINCENT MOURIK, MAJA CASSIDY, ATTILA GERESDI, Delft Univ. of Tech, DIANA CAR, Eindhoven Univ. of Tech, ERIK BAKKERS, Delft Univ. of Tech, Eindhoven Univ. of Tech, SRIJIT GOSWAMI, Delft Univ. of Tech, KENJI WATANABE, TAKASHI TANIGUCHI, Advanced Materials Laboratory, National Institute for Materials Science, Japan, LEO KOUWENHOVEN, Delft Univ. of Tech — Majorana modes in hybrid superconductor-semiconductor nanowire devices can be probed via tunnelling spectroscopy which shows a zero bias peak (ZBP) in differential conductance (1). Majoranas are formed when the Zeeman energy E_Z and the chemical potential μ satisfy the condition $E_Z > \sqrt{\Delta^2 + \mu^2}$, with Δ the superconducting gap. This Majorana condition outlines the topologically non-trivial phase and predicts a particular dependence of ZBPs on the gate voltage and the external magnetic field. In this talk we show that the magnetic field range of ZBPs can be tuned by gate voltage and vice versa, consistent with these Majorana predictions. Supported by measurements in different external magnetic field orientations, these observations pave the way for exploring the topological phase diagram of spin-orbit coupled semiconductor nanowires with induced superconductivity.
(1) V. Mourik, K. Zuo et al, *Science* **336**, 1003 (2012)

Hao Zhang
Delft University of Technology

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