Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Majorana modes in InSb nanowires (I): zero bias peaks in hybrid devices with low-disorder and hard induced superconducting gap Ö. GÜL, H. ZHANG, M.W.A. DE MOOR, F. DE VRIES, J. VAN VEEN, D.J. VAN WOERKOM, K. ZUO, V. MOURIK, M. CASSIDY, A. GERESDI, Delft Univ. of Tech., D. CAR, Eindhoven Univ. of Tech., E.P.A.M. BAKKERS, Delft Univ. of Tech., Eindhoven Univ. of Tech., S. GOSWAMI, Delft Univ. of Tech., K. WATANABE, T. TANIGUCHI, Advanced Materials Laboratory, National Institute for Materials Science, Japan, L.P. 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). However, alternative mechanisms such as disorder or formation of quantum dots can also give rise to ZBPs, and obscure experimental studies of Majoranas. Further, a soft induced superconducting gap commonly observed in experiments presents an outstanding challenge for the demonstration of their topological protection. In this talk we show that with device improvements, we reach low-disorder transport regime with clear quantized conductance plateaus and Andreev enhancement approaching the theoretical limit. Tunnelling spectroscopy shows a hard induced superconducting gap and no formation of quantum dots. Together with extremely stable ZBPs observed in large gate voltage and magnetic field ranges, we exclude various alternative theories besides the formation of localized Majorana modes for our observations.
(1) V. Mourik, K. Zuo et al, *Science* **336**, 1003 (2012)

O. Gul
Delft Univ. of Tech.

Date submitted: 06 Nov 2015 Electronic form version 1.4