

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Collective Quantum Phase-Slip Dynamics in Superconducting Nanowire Arrays SEBASTIAN T. SKACEL, JAN N. VOSS, TOBIAS BIER, LUCAS RADKE, MARTIN WEIDES, HANNES ROTZINGER, Physikalisches Institut, Karlsruhe Institute of Technology, D-76131 Karlsruhe, Germany, HANS E. MOOIJ¹, Kavli Institute of Nanoscience, Delft University of Technology, 2628 CJ Delft, The Netherlands, ALEXEY V. USTINOV¹, Physikalisches Institut, Karlsruhe Institute of Technology, D-76131 Karlsruhe, Germany — Superconducting nanowire arrays exhibit quantum phase-slip (QPS) phenomenon if the superconductor has a very high normal-state sheet resistance. We experimentally study QPS effects in arrays of nanowires embedded in a resonant circuit at GHz frequencies. We probe this circuit at ultra-low microwave power, applied flux and mK temperatures. The nanowires are fabricated utilizing aluminium grown in a precisely-controlled oxygen atmosphere. In this way, we aim to control the QPS rate for a given wire width. The wires are defined with conventional electron beam lithography down to a width of 20 nm. We will present the fabrication of the nanowire arrays and first microwave measurements at mK temperatures.

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Date submitted: 15 Nov 2013

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