

Abstract Submitted  
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**Controlled fabrication and electrical properties of long quasi-one-dimensional superconducting nanowire arrays**<sup>1</sup> KE XU, JAMES HEATH, Division of Chemistry and Chemical Engineering, California Institute of Technology — Quasi-one-dimensional superconducting nanowires are an interesting and ideal system to examine fundamental superconductivity physics and size effects on superconductivity. We report a general method for reliably fabricating quasi-one-dimensional superconducting nanowire arrays, with good control over nanowire cross section and length, and with full compatibility with device processing methods. We investigate Nb nanowires with individual nanowire cross sectional areas that range from bulk-like to  $10 \times 11$  nm, and with lengths from 1 to 100 micrometers. Nanowire size effects are systematically studied. In particular, a comprehensive investigation of influence of nanowire length on superconductivity is reported for the first time. All results are interpreted within the context of phase-slip models.

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