

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Niobium superconducting networks and its anisotropy J. HUA¹, Z.L. XIAO, U. PATEL, T. XU, D. ROSENMAN, V. NOVOSAD, U. WELP, W.K. KWOK, G.W. CRABTREE, Argonne National Laboratory — Novel properties such as an oscillating phase boundary in the magnetic field – temperature (H-T) diagram have been reported in superconducting films containing a regular hole array where the interhole separation is comparable to the superconducting coherence length – the superconducting networks. Aluminum is the most common material used in fabricating such superconducting networks due to its large coherence length. However, they require low He³ refrigeration temperatures due to aluminum's low critical temperature of about 1 K. Here, we report on the fabrication of Nb superconducting networks with interhole separation down to tens of nanometers and critical temperatures up to 9K. In addition, we present results on angular dependence of the critical temperature and magnetoresistance of the superconducting networks.

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Date submitted: 02 Dec 2005

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