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Nanowires and Nanoribbons of Charge-Density-Wave Conductor $NbSe_3$ YEW SAN HOR, ZHILI XIAO[1], ULRICH WELP, JOHN F. MITCHELL, RUSSELL E. COOK, WAI-KWONG KWOK, GEORGE W. CRABTREE, Materials Science Division, Argonne National Laboratory, Argonne, Illinois 60439, YASUO ITO, Department of Physics, Northern Illinois University, DeKalb, Illinois 60115 — We report synthesis of nanowires and nanoribbons of the charge- density-wave conductor $NbSe_3$ through direct reaction of Nb and Se powders under careful temperature control. The thickness of these nanostructures range from tens of nanometers to a few hundreds nanometers. Their morphologies and crystal structures were studied with scanning electron microscopy, x- ray diffraction and transmission electron microscopy. Four- probe resistivity measurements were conducted to characterize their electronic properties. Significant enhancement in depinning threshold fields was also observed in the nanowires in comparison to the values of the bulk crystals.

[1]also affiliated to Department of Physics, Northern Illinois University, DeKalb, Illinois 60115

Yew San Hor
Materials Science Division, Argonne National Laboratory, Argonne, Illinois 60439

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