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Field-Effect Modulation of Charge Density Wave Conduction[1]
ETHAN GEIL, ROBERT THORNE, Cornell University — We have constructed field-effect devices, analogous to MOSFETs, with crystals of the charge-density wave (CDW) conductor NbSe3 as the channel. Applying a gate voltage across an oxide insulator modulates the carrier density in the NbSe3 and also applies a transverse electric field. Surprisingly, relatively small ($\sim 0.1\%$) changes in carrier density (as measured by the single particle conductivity) produce large ($\sim 40\%$) decreases in the threshold field for collective conduction. We discuss this result in terms of collective screening of the applied field and modulation of the CDW order parameter.

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