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Quantum Hall Nematic States in Graphene DERRICK BOONE, AARON SHARPE, WEN-MIN YANG, ARTHUR BARNARD, DAVID GOLDHABER-GORDON, Stanford Univ, RAKASHI TANIGUCHI, KENJI WATANABE, Japanese National Institute of Materials Science — In the quantum Hall effect at millikelvin temperatures, specific half-filled Landau levels in gallium arsenide show striking anisotropy in magnetotransport. Theoretical predictions and scanning gate microscopy measurements suggest these states are quantum Hall nematics: the partitioning of what is on average a half-filled Landau level into periodic stripes of integer-filled landau levels with long-range directional order. While this transport anisotropy has been observed in high-mobility GaAs two-dimensional electron gases, there is no clear evidence of quantum hall nematic states in graphene. Here, we discuss transport measurements of graphene at half-filling with geometries designed to identify transport anisotropy that is the signature of the quantum Hall nematic state.

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