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Probing the transport gap in edge disordered graphene nanoribbons MELINDA HAN, PHILIP KIM, Columbia University — We present experimental studies on the detailed nature of the transport gap observed in etched graphene nanoribbons. Temperature dependent measurements of electronic transport in the "gapped" region of suppressed conductance suggest transport via localized states or charge islands, giving rise to separate energy scales for hopping conductance and the transport gap. Distinct temperature regimes with different exponential temperature dependences are observed, with a crossover temperature dependent on ribbon width. A transition to "bulk" graphene electronic behavior is observed for wider ribbons, and the size of the transport gap shows a length dependence consistent with conduction due to hopping.

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