

Abstract Submitted
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Transport Through Andreev Bound States in a Graphene Quantum Dot TRAVIS DIRKS, TAYLOR L. HUGHES, SIDDHARTHA LAL, BRUNO UCHOA, YUNG-FU CHEN, CESAR CHIALVO, PAUL M. GOLDBART, NADYA MASON, University of Illinois at Urbana-Champaign — We have performed transport measurements on a graphene-insulator-superconductor junction, and report the direct observation of sharp, gate-tunable Andreev bound states (ABS) in a graphene quantum dot (QD)[1]. The quantum dot is formed underneath the superconducting lead by local gating due to a work-function mismatch. We show that the ABS form when the discrete QD levels are proximity coupled to the superconducting contact. We find subgap resonant features which are remarkably narrow, can be tuned to zero energy by gating, and show a striking pattern as a function of applied bias and gate voltage.

[1] T. Dirks et al., arXiv:1005.2749 (2010)

Bruno Uchoa
University of Illinois at Urbana-Champaign

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