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Graphene Superconducting Quantum Interference Device ÇAĞLAR GIRIT, Department of Physics, University of California, Berkeley and Materials Sciences Division, Lawrence Berkeley National Laboratory, VINCENT BOUCHIAT, Institut NEEL, CNRS-Grenoble, OFER NAAMAN, Quantum Nanoelectronics Laboratory, Department of Physics, University of California, Berkeley, YUANBO ZHANG, Department of Physics, University of California, Berkeley, MICHAEL CROMMIE, ALEX ZETTL, Department of Physics, University of California, Berkeley and Materials Sciences Division, Lawrence Berkeley National Laboratory, IRFAN SIDDIQI, Quantum Nanoelectronics Laboratory, Department of Physics, University of California, Berkeley — Graphene can support Cooper pair transport when contacted with two superconducting electrodes, resulting in the well-known Josephson effect. By depositing aluminum/palladium electrodes in the geometry of a loop onto a single graphene sheet, we fabricate a two junction dc superconducting quantum interference device (SQUID). Not only an the supercurrent in this device be increased by moving the electrostatic gate away from the Dirac point, but it can also be modulated periodically by an applied magnetic field—a potentially powerful probe of electronic transport in graphene. We analyze the magnetic field modulation of the critical current with the asymmetric/inductive SQUID model of Fulton and Dynes and discuss the variation of the fitting parameters with gate voltage.

Caglar Girit
Department of Physics, University of California, Berkeley and
Materials Sciences Division, Lawrence Berkeley National Laboratory

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