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Direct measurements of the current-phase relation in graphene Josephson junctions CESAR CHIALVO, ION MORARU, NADYA MASON, DALE VAN HARLINGEN, Department of Physics and Materials Research Laboratory, University of Illinois at Urbana-Champaign — The current-phase relation (CPR) of a Josephson junction can provide key information about the microscopic processes and symmetries that influence the supercurrent. However, CPR has not been previously measured in junctions with graphene barriers, which is a system that exhibits unusual electronic properties and symmetries. In this talk we present CPR results on Josephson junctions containing single-layer graphene as a weak link. The measurements are based on a phase-sensitive SQUID technique in which we determine the supercurrent amplitude and phase as a function of both temperature and electrostatic doping (gate voltage). We discuss evidence for a non-sinusoidal shape of the CPR, which is in agreement with some theoretical predictions.

Cesar Chialvo

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