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**Direct measurements of the current-phase relation in graphene Josephson junctions** CHRISTOPHER ENGLISH, DAVID HAMILTON, DALE VAN HARLINGEN, NADYA MASON, 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 control the supercurrent. In this talk, we present CPR measurements on Josephson junctions incorporating single-layer graphene as a weak link between Al superconducting electrodes with spacing  $<100\text{nm}$  that are in the quasi-ballistic regime. We use a phase-sensitive SQUID technique to determine the supercurrent amplitude and phase as a function of temperature and electrostatic doping (gate voltage). As the critical current is varied, we observe a crossover from forward skewing in the CPR that arises from the low density of discrete electronic states in the junction to backward skewing induced by noise-rounding in the CPR measurement. We compare our results to theoretical models.

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