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Anomalous supercurrent switching in graphene under proximity e^1 ALEX LEVCHENKO, Michigan State University, U.C. COSKUN, M. BRENNER, T. HYMEL, University of Illinois at Urbana-Champaign, V. VAKARYUK, Argonne National Laboratory, A. BEZRYADIN, University of Illinois at Urbana-Champaign — We report a study of hysteretic current-voltage characteristics in superconductor-graphene-superconductor (SGS) junctions. The stochastic nature of the phase slips is characterized by measuring the distribution of the switching currents. We find that in SGS junctions the dispersion of the switching current scales with temperature as $\sigma_I \propto T^{\alpha_G}$ with $\alpha_G \approx 1/3$. This observation is in sharp contrast with the known Josephson junction behavior where $\sigma_I \propto T^{\alpha_J}$ with $\alpha_J = 2/3$. We propose an explanation using a modified version of Kurkijarvi's theory for the flux stability in rf-SQUID and attribute this anomalous effect to the temperature dependence of the critical current which persists down to low temperatures.

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Prefer Oral Session
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