

Abstract Submitted
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Probing the origin of $1/f$ critical-current noise in nanoscale Al/AlO_x/Al Josephson junctions¹ CHRISTOPHER NUGROHO, VLADIMIR ORLYANCHIK, ALLISON DOVE, GUSTAF OLSON, ZACHARY YOSCOVITS, JAMES ECKSTEIN, DALE VAN HARLINGEN, Department of Physics, University of Illinois at Urbana-Champaign — We present measurements of the low frequency noise in nanoscale Al/AlO_x/Al Josephson junctions made by the shadow/angle evaporation technique. We investigate the differences in the nature of the charge trap fluctuations when the junction electrodes are in the normal state vs. in the superconducting state, as a test of some recent theoretical models. To do that, we compare the magnitude, temperature dependence, and magnetic field dependence of junction resistance fluctuations in the normal state above the Al transition temperature to that of the resistance and critical current fluctuations measured in the superconducting state. We also explore whether the observed fluctuators are thermally-activated or tunneling as a function of temperature.

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