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Switching-current distributions for superconducting nanowires. MITRABHANU SAHU, UIUC, ANDREY ROGACHEV, University of Utah, DAVID PEKKER, TZU-CHIEH WEI, NAYANA SHAH, PAUL M. GOLDBART, ALEXEY BEZRYADIN, UIUC — The decay of metastable states plays a crucial role in the implementation of quantum devices. Switching between the superconducting and resistive states of a superconducting nanowire is an example of such a decay. Here, we report new results on the switching-current distribution measured on amorphous superconducting $Mo_{79}Ge_{21}$ and Nb nanowires at various temperatures. A premature switching between the superconducting (V$\sim$0) state and the resistive (V$\sim \Delta$) state is a stochastic process. To study this process we have performed several thousand measurements at each temperature setting. We observe an anomalous temperature dependence of the switching current distribution. Unlike in other similar measurements, our distribution widens as the temperature is reduced.We have also calculated the escape rates from the superconducting state to the resistive state from these distributions. We discuss the possibility of describing such behavior in terms of thermal and quantum phase slips.

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