

Abstract Submitted
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Real-time observation of quasiparticle poisoning in a single cooper pair transistor OFER NAAMAN, JOSÉ AUMENTADO, National Institute of Standards and Technology, 325 Broadway, Boulder CO. 80305 — We probe the charge state of a single cooper-pair transistor (SCPT) via its charge dependent Josephson inductance by measuring the reflected rf power off of a microwave circuit embedding the device. Since the entire measurement is performed without the SCPT ever leaving its supercurrent branch, this readout of the SCPT state does not induce quasiparticle generation. This fact, together with the high bandwidth of the measurement, allows us to observe quasiparticle poisoning events in the time domain. We measure and analyze the temporal distribution of these events to extract the lifetimes of the poisoned (one unpaired electron on the SCPT island) and unpoisoned states, and study their statistics as a function of gate charge, current bias and temperature. We compare the results with data we obtained simultaneously from switching current experiments on the same device.

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