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Finite bandwidth effects in time-domain measurements of fast electronic processes OFER NAAMAN, JOSÉ AUMENTADO, NIST, 325 Broadway, Boulder CO., 80305 — Using rf reflectometry, we have observed individual quasiparticle tunneling events in a superconducting single- charge transistor. These events follow a Poisson process on microsecond time scales. We show that when the measurement is done with a finite bandwidth receiver, the experimentally observed process is no longer Poissonian, and the measured transition rates always underestimate those in the underlying system. We will present a model that accounts for bandwidth effects in these time-domain measurements, and show how to obtain the underlying rates from their measured values. We compare the results of our model to simulated and experimental data. We argue that these effects, which are significant even if the receiver is 10 times faster than the process, are a general feature in time domain experiments.

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