

Abstract Submitted
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Mesoscopic electrons driven by quantum microwave states II: nonclassical light and noise JEAN-RENE SOUQUET, Laboratoire de Physique des Solides, Université Paris Sud, MATTHEW WOOLLEY, UNSW Canberra, JULIEN GABELLI, PASCAL SIMON, Laboratoire de Physique des Solides, Université Paris Sud, AASHISH CLERK, Department of Physics, McGill University — Motivated by recent experiments where superconducting microwave circuits have been coupled to electrons in semiconductor nanostructures [1-3], we consider theoretically the general problem of a mesoscopic conductor driven by a quantum microwave field. We focus here on perhaps the most dramatic case, where the microwave field is prepared in a highly non-classical cat state. We consider both signatures of this nonclassical light on the dc current through the conductor, as well as additional features which emerge in the low-frequency current noise. Our calculations incorporate both the use of quantum-optics phase-space methods, and also a general Keldysh formalism that allows a more complete description.

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