

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Over-bias Light Emission due to Higher Order Quantum Noise of a Tunnel Junction WOLFGANG BELZIG, University of Konstanz, FEI XU, University of Konstanz, Konstanz, Germany, CECILIA HOLMQVIST, Norwegian University of Science and Technology, Trondheim, Norway — Understanding tunneling from an atomically sharp tip to a metallic surface requires to account for interactions on a nanoscopic scale. Inelastic tunneling of electrons generates emission of photons, whose energies intuitively should be limited by the applied bias voltage. However, experiments [Phys. Rev. Lett. 102, 057401 (2009)] indicate that more complex processes involving the interaction of electrons with plasmon polaritons lead to photon emission characterized by over-bias energies. We propose a model of this observation in analogy to the dynamical Coulomb blockade, originally developed for treating the electronic environment in mesoscopic circuits. We explain the experimental finding quantitatively by the correlated tunneling of two electrons interacting with an LRC circuit modeling the local plasmon-polariton mode. To explain the over-bias emission, the non-Gaussian statistics of the tunneling dynamics of the electrons is essential. Reference: F. Xu, C. Holmqvist, and W. Belzig Phys. Rev. Lett. 113, 066801 (2014)

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Date submitted: 06 Nov 2015

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