

Abstract Submitted
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Two electron coherence in electron quantum optics¹ PASCAL DE-GIOVANNI, CNRS / ENS Lyon, CLEMENT CABART, BENJAMIN ROUSSEL, ETIENNE THIBIERGE, ENS Lyon, DARIO FERRARO, Universite Aix Mediterranee, ARTHUR MARGUERITE, GWENDAL FVE, ENS Paris — Engineering and studying few-electron states in ballistic conductors is a key step towards understanding the emergence of many-body physics and entanglement in quantum electronic systems [Ann. Phys. (Berlin) **526**, 1 (2014)]. In this talk, we will discuss intrinsic two electron coherence of an electronic source in quantum Hall edge channels and relate it to two-electron wave functions. Inspired by photon quantum optics we will relate it to the current noise in an Hanbury Brown and Twiss interferometer thus relating electronic coherences to the quantum fluctuations of the radiation emitted by the conductor. We will show how it can be measured using two particle interferences in Franson-like interferometers thus realizing a two-particle analog of a Mach-Zehnder interferometer [Phys. Rev.B **113**, 081302(R) 2016].

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