Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Nonsymmetrized Correlations in Mesoscopic Current Measurements WOLFGANG BELZIG, University of Konstanz, ADAM BEDNORZ, University of Warsaw, CHRISTOPH BRUDER, University of Basel, BERTRAND REULET, University of Sherbrooke — A long-standing problem in quantum mesoscopic physics is which operator order corresponds to noise expressions like $\langle I(\omega)I(-\omega)\rangle$, where $I(\omega)$ is the measured current at frequency ω. Symmetrized order describes a classical measurement while nonsymmetrized order corresponds to a quantum detector, e.g., one sensitive to either emission or absorption of photons. We show that both order schemes can be embedded in quantum weak-measurement theory taking into account measurements with memory, characterized by a memory function which is independent of a particular experimental detection scheme [A. Bednorz, C. Bruder, B. Reulet, and W. Belzig, Phys. Rev. Lett. **110**, 250404 (2013)]. We discuss the resulting quasiprobabilities for different detector temperatures and how their negativity can be tested on the level of second-order correlation functions already. Experimentally, this negativity can be related to the squeezing of the many-body state of the transported electrons in an ac-driven tunnel junction.

Wolfgang Belzig
University of Konstanz

Date submitted: 17 Nov 2013 Electronic form version 1.4