

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Entanglement from Charge Statistics: Exact Relations for Many-Body Systems** FRANCIS SONG, Yale University, CHRISTIAN FLINDT, Université de Genève, STEPHAN RACHEL, Yale University, ISRAEL KLICH, University of Virginia, KARYN LE HUR, Yale University — We present exact formulas for the entanglement and Rényi entropies generated at a quantum point contact (QPC) in terms of the statistics of charge fluctuations, which we illustrate with examples from both equilibrium and non-equilibrium transport. The formulas are also applicable to groundstate entanglement in systems described by non-interacting fermions in any dimension, which in one dimension includes the critical spin-1/2 XX and Ising models where conformal field theory predictions for the entanglement and Rényi entropies are reproduced from the full counting statistics. These results may play a crucial role in the experimental detection of many-body entanglement in mesoscopic structures and cold atoms in optical lattices.

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Date submitted: 17 Nov 2010

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