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Multiparticle interference, GHZ entanglement, and full counting statistics HEUNG-SUN SIM, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 305-701, Korea, EUGENE V. SUKHORUKOV, Department of Theoretical Physics, University of Geneva, CH-1211 Geneva 4, Switzerland — We study [1] quantum coherent transport in a generalized N-particle Hanbury Brown-Twiss setup enclosing magnetic flux, where electrons are injected from N independent sources and collected in N distant detectors, and show that the N-th order cumulant of current cross correlations exhibits flux-dependent periodic Aharonov-Bohm (AB) oscillations, while there is no such oscillation in all the lower-order cumulants. The origin of the multiparticle interference is the orbital Greenberger-Horne-Zeilinger entanglement of N identical particles. For sufficiently strong AB oscillations the generalized N-particle Bell inequalities may be violated, proving the N-particle quantum nonlocality.

[1] H.-S. Sim and E. V. Sukhorukov, condmat/0508399.

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