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Antibunching and unconventional photon blockade with Gaussian squeezed states MARC-ANTOINE LEMONDE, McGill University, NICOLAS DIDIER, McGill University, Université de Sherbrooke, AASHISH CLERK, McGill University — There is considerable interest in both the circuit QED[1] and optomechanics,[2] experiments in using the measured intensity fluctuations of a bosonic field as a direct signature of a nonclassical state. Although these nonclassical signatures, such as antibunching, are usually observed in strongly nonlinear systems, they also have been reported with Gaussian states in linear systems.[3] To clarify the significance of the intensity correlations, we derive a sufficient condition for deducing if a field is non-Gaussian based on intensity correlations measurement.[4] With these results in hands, we shed light on the so-called *unconventional photon blockade* effect predicted in a driven two-cavity setup with surprisingly weak Kerr nonlinearities, stressing that it is a particular realization of optimized Gaussian amplitude squeezing.

[1]D. Bozyigit, *et al.*, Nat. Phys. **7**, 154-158 (2011).
[2]J. D. Cohen, *et al.* arXiv:1410.1047.
[3]N. B. Grosse, *et al.*, Phys. Rev. Lett. **98**, 153603 (2007).
[4]M.-A. Lemonde, N. Didier, A. A. Clerk, arXiv:1410.6510.

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