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Sub-binomial light

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Nonclassical states of light are necessary resources for quantum technologies such as cryptography, computation and the definition of metrological standards. Observing signatures of nonclassicality generally requires inferring either the photon number distribution or a quasiprobability distribution indirectly from a set of measurements. Here, we report an experiment in which the nonclassical character of families of quantum states is assessed by direct inspection of the outcomes from a multiplexed photon counter [Phys. Rev. Lett. 110, 173602 (2013)]. This scheme does not register the actual photon number distribution; the statistics of the detector clicks alone serve as a witness of nonclassicality, as proposed by Sperling et al. [Phys. Rev. Lett. 109, 093601 (2012)]. Our work paves a way for the practical characterization of increasingly sophisticated states and detectors.