How to measure squeezing and entanglement of Gaussian states without homodyning

Jaromír Fiurášek QUIC, Ecole Polytechnique, CP 165, Université Libre de Bruxelles, 1050 Bruxelles, Belgium
Department of Optics, Palacký University, 17. listopadu 50, 77200 Olomouc, Czech Republic

Nicolas J. Cerf QUIC, Ecole Polytechnique, CP 165, Université Libre de Bruxelles, 1050 Bruxelles, Belgium

abstract We propose a scheme for measuring the squeezing, purity, and entanglement of Gaussian states of light that does not require homodyne detection. The suggested setup only needs beam splitters and single-photon detectors. Two-mode entanglement can be detected from coincidences between photodetectors placed on the two beams.