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Title:	Generalized photon-subtracted squeezed vacuum states
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Abstract:	We construct a generalized version of the photon-subtracted squeezed vacuum states (PSSVS), which can be utilized to construct the same for nonlinear, deformed and any usual quantum mechanical models beyond the harmonic oscillator. We apply our general framework to trigonometric Pöschl-Teller potential and show that our method works accurately and produces a proper nonclassical state. We analyze the nonclassicality of the state using three different approaches, namely, quadrature squeezing, photon number squeezing and Wigner function and indicate how the standard definitions of those three techniques can be generalized and utilized to examine the nonclassicality of any generalized quantum optical states including the PSSVS. We observe that the generalized PSSVS are always more nonclassical than those arising from the harmonic oscillator. Moreover, within some quantification schemes, we find that the nonclassicality of the PSSVS increases almost proportionally with the number of photons subtracted from the generalized squeezed vacuum state. Thus, generalized PSSVS may provide an additional freedom with which one can regulate the nonclassicality and obtain an appropriate nonclassical state as per requirement
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