

The negativity of Wigner function as a measure of quantum correlations

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Abstract

In this paper we study comparatively the behaviors of Wigner function and quantum correlations for two quasi-Werner states formed with two general bipartite superposed coherent states. We show that the Wigner function can be used to detect and quantify the quantum correlations. However, we show that it is in fact not sensitive to all kinds of quantum correlations but only to entanglement. Then, we analyze the measure of non-classicality of quantum states based on the volume occupied by the negative part of the Wigner function.

Keywords: Quantum discord; Entanglement; Coherent states; Werner states; Wigner function; non-classicality

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