On Diagonal P-Representation of Superposition Field of Two Light Modes

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Abstract: For the superposition field $a_1^\dagger + a_2^\dagger$ of two light modes we introduce an appropriate diagonal P-representation which is constructed on the common eigenvectors $|z,x\rangle$ of $(X_1 - X_2)$ and $a_1 + a_2$, where $X_i = (a_i + a_i^\dagger)/\sqrt{2}$, $[a_i, a_i^\dagger] = \delta_{ij}$. It is remarkable that $|z,x\rangle$ make up a new quantum mechanical representation.

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