Entropic uncertainty relations in the tomographic-probability representation

Margarita A. Man'ko

P.N. Lebedev Physical Institute
Moscow, Russian Federation

mmanko@sci.lebedev.ru

Abstract

Photon states in quantum optics are known to be associated with fair probability distributions called tomographic-probability distributions or state tomograms. The entropies determined by the optical tomographic probabilities satisfy the inequalities which are entropic uncertainty relations. The entropic inequalities correspond to the presence of quantum correlations, and they can be violated for fluctuating classical optical field states. In the case of discrete variables suitable to describe the qubits, qudits, and photon polarization states, new tomographic entropic inequalities are obtained and expressed in terms of unitary matrix-elements inequalities.