Local asymptotic normality for qubit states. (English summary)


The asymptotic properties of the state of $n$ qubits identically prepared in the joint state $\rho^{\otimes n}$ are studied. It is shown that for all individual states $\rho$ situated in a local neighborhood of size $1/\sqrt{n}$ of a fixed state $\rho^0$, there exist trace-preserving quantum channels which map the qubit states asymptotically close to a corresponding state of a quantum harmonic oscillator uniformly over all states in the local neighborhood. It is also shown that the optimal joint measurement in the Bayesian setup is also optimal within the point-wise approach, and converges to the optimal joint measurement of position and momentum for the quantum oscillator.

Reviewed by Adán Cabello