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**The Role of Non-Gaussianity in Quantum Estimation,
Decoherence and State Engineering**

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Abstract:

We address quantification of non-Gaussianity of states and operations in continuous-variable systems and its use in quantum information. At first we discuss generation of nonG states in quantum optical systems, either by dynamical or conditional schemes. Then we deal with parameter estimation and present two theorems connecting non-Gaussianity to quantum Fisher information.

Finally, we address the degradation of continuous variable (CV) entanglement in Markovian noisy channels focusing on the set of photon-number entangled states and provide several evidences supporting the conjecture that Gaussian entanglement is the most robust against noise, i.e. it survives longer than non-Gaussian one.