Title:	Continuous variable Gaussian and non-Gaussian states: Estimation, nonlocality and quantum key distribution
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Abstract:	Continuous variable (CV) quantum information processing is a well-established area of research today. We consider the quantized electro- magnetic field as our system, where the quadrature operators of the electric field are the relevant degrees of freedom. This thesis focuses on quantum state tomography and quantum process tomography, nonlocality, and quan- tum key distribution (QKD) in the context of CV systems. We first explore the relative performance of various Gaussian measurement schemes in the es- timation of single mode Gaussian states. We then discuss an optimal scheme for the characterization of n-mode Gaussian states using photon number measurements. Thereafter, we provide an optimal scheme for the charac- terization of n-mode Gaussian channels. In a different direction, we explore nonlocality in four mode Gaussian and non-Gaussian states of CV systems using multiphoton Bell-type inequality. We then move on to QKD, where two parties wish to establish a shared secret key. Here we show that photon subtracted two mode squeezed coherent states can enhance the performance of continuous variable measurement device independent quantum key distri- bution protocols. Finally, we examine the possibility of carrying out QKD using coherent states prepared on superconducting rings with a mesoscopic Josephson junction.
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