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Non-Markovian Quantum Cryptography

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Abstract:

We address continuous variable quantum key distribution (QKD) in non-Markovian lossy channels and show how the non-Markovian features may be exploited to enhance security and/or to detect the presence and the position of an eavesdropper along the transmission line. In particular, we suggest a coherent states QKD protocol which is secure against individual attacks for arbitrarily low values of the overall transmission line. Our scheme relies on specific non-Markovian properties, and cannot be implemented in ordinary Markovian channels characterized by uniform losses.