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Higher dimensional quantum key distribution in the presence of quantum noise

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Abstract content
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Quantum key distribution (QKD) allows two parties, Alice and Bob, to generate a secret key in the presence of an eavesdropper, Eve [Gisin N, Ribordy G, Tittel W and Zbinden H 2002 Rev. Mod. Phys. 74 145-195]. QKD promises the legitimate parties to exchange private information by means of provable-secure protocols. The security is solely based on the quantum mechanical laws of physics. Since QKD is at the level of implementation and since these protocols usually operate in some noisy channels, we investigate how the addition of noise in the communication channel affects the secret key generation rates. The effect of noise for low dimensional QKD protocols has been already studied [Mertz M, Kampermann H, Shadman Z and Bruß D 2013 Phys. Rev. A 87(4) 042312]. Here, we investigate the behavior of secret key rates when one adds some noise before classical processing for a class of high dimensional QKD protocols

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PhD

Main supervisor (name and email) and his / her institution

Prof. F. Petruccione

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