Statistical Quadrature Evolution for Continuous-Variable Quantum Key Distribution[1] LASZLO GYONGYOSI, Budapest University of Technology, Hungarian Academy of Sciences, SANDOR IMRE, Budapest University of Technology — We propose a statistical quadrature evolution (SQE) method for multicarrier continuous-variable quantum key distribution (CVQKD). A multicarrier CVQKD protocol utilizes Gaussian subcarrier quantum continuous variables (CV) for information transmission. The SQE framework provides a minimal error estimate of the quadratures of the CV quantum states from the discrete, measured noisy subcarrier variables. We define a method for the statistical modeling and processing of noisy Gaussian subcarrier quadratures. We introduce the terms statistical secret key rate and statistical private classical information, which quantities are derived purely by the statistical functions of our method. We prove the secret key rate formulas for a multiple access multicarrier CVQKD. The framework can be established in an arbitrary CVQKD protocol and measurement setting, and are implementable by standard low-complexity statistical functions, which is particularly convenient for an experimental CVQKD scenario.

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Date submitted: 27 Jan 2016   Electronic form version 1.4