

Quantum Repeaters: Analytical Models and Optimized Protocols

Peter van Loock

University of Mainz

Abstract

We give an overview of our efforts to model fiber-based, memory-based quantum repeaters for long-range quantum key distribution or more general quantum network applications.

Under given experimental assumptions such as the possibility of probabilistic or deterministic entanglement swapping we calculate and optimize the final (secret key) rates for medium-size repeaters including the most important experimental parameters. We also briefly discuss possible variations such as memory-free approaches based on bosonic quantum error correction codes.