

## Quantum Physics

# Fully automated entanglement-based quantum cryptography system for telecom fiber networks

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We present a quantum key distribution (QKD) system based on polarisation entanglement for use in telecom fibers. A QKD exchange up to 50km was demonstrated in the laboratory with a secure key rate of 550 bit/s. The system is compact, portable with a fully automated start-up and stabilisation modules for polarisation, synchronisation and photon coupling allow a hands-off operation. Stable and reliable key exchange in a deployed optical fiber of 16km length was demonstrated. In this fiber network we achieved over two weeks an automatic key generation with an average key rate of 2000 bit/s without manual intervention. During this period, the system had an average entanglement visibility of 93%, highlighting the technical level and stability achieved for entanglement-based quantum cryptography.

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