

Title: Security assessment and key management in a quantum key distribution network

Abstract:

Recently, a few field tests of quantum key distribution (QKD) networks have been presented throughout the world. By proposing a framework of a QKD network, we design a communication scheme with the highest security level that trusts a minimum number of intermediate nodes. Moreover, when the quantum key is a limited resource, we design key management and data scheduling schemes to optimize the utility of the data transmission. Our results can be directly applied to the current metropolitan and free-space quantum network implementations.