

**Beige, Almut; Englert, Berthold-Georg; Kurtsiefer, Christian; Weinfurter, Harald**

**Communication with qubit pairs.** (English) [Zbl 1075.81505](#)

Chen, Goong (ed.) et al., Mathematics of quantum computation. Boca Raton, FL: Chapman & Hall/CRC (ISBN 1-58488-282-4). Computational Mathematics Series, 359-401 (2002).

Quantum information is transmitted either by single qubit, and the model is then probabilistic, or by qubit pairs, in which case the scheme is deterministic. Here one describes and analyzes this last nonrandom model. As a preliminary example, the authors bear in mind the (Vaidman-Aharonov-Albert) mean kings first problem and the mean kings second problem of which a careful analysis will introduce to quantum cryptography. Then cryptography with single qubits is considered via minimizing error probability or maximizing raw information. In a like manner, cryptography with qubit pairs are dealt with via both approaches. Then, by using an idealized single-photon model, one shows how the schemes for secure key distribution can be realized exponentially by quantum-optical means.

For the entire collection see [\[Zbl 1077.81018\]](#).

Reviewer: [Guy Jumarie \(Montréal\)](#)

**MSC:**

[81P68](#) Quantum computation

Cited in **1** Document