Secure Communications Using Quantum Continuous Variables

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During the last 20 years, Quantum Continuous Variables have emerged as a valid and interesting alternative to the usual qubits for quantum information processing. We will briefly review these developments and focus on continuous variable (CV) quantum key distribution (QKD) [1-3], which is much closer to standard optical telecommunication techniques than discrete variable (DV) QKD. In particular, CVQKD does not use photon counters but coherent (homodyne or heterodyne) detections, which are now very usual in high-speed commercial telecom systems. In addition, using a "truly local" oscillator allows one to simplify security issues and eliminate potentially unsecured side channels. We will present recent developments in CVQKD using Probabilistic Constellation Shaping [4], also related to recent security proofs [5,6], and hardware improvement. This talk will illustrate the potential of CVQKD and CV in general, for widespread use in secure communication networks.

References

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