Abstract Submitted
for the DAMOP07 Meeting of
The American Physical Society

Sorting Category: 5.2 (E)

Towards Fast Quantum Secured Communication ITZEL LUCIO MARTINEZ, PHILIP CHAN, student, STEVE HOSIER, XIAOFAN MO, Postdoctoral position, WOLFGANG TITTEL, Associate professor — An ideal implementation of QKD would employ a perfect single photon source which is currently not available. The decoy state protocol uses faint laser pulses with different intensities that allows the two end points to eliminate cryptographic key data created from multi-photon pulses. The remaining cryptographic key data is obtained from single-photon pulses making it absolutely secure. The decoy state protocol increases the distance of transmission and the rate of secret key generation. In this poster we discuss the implementation of a decoy state protocol using polarization encoding in a standard telecommunication fibre Alice generates laser pulses which are then intensity modulated and attenuated to produce either signal or decoy states. Alice then uses phase modulators to create polarization states which she sends, via a fibre link, to Bob. Bob uses polarization beam splitters and single photon detectors to separate and measure the polarization states. The implementation of the decoy state protocol and the advances in single photon detectors expected in the next few years, will result in a significant increase in the achievable raw key rate. It is thus necessary to develop high speed solutions for the classical post-processing required for QKD. To this end, a FPGA implementation of low-density parity-check codes utilizing a set of precomputed codes is being investigated.

Itzel Lucio Martinez
ilucio@qis.ucalgary.ca
student

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Date submitted: 06 Feb 2007 Electronic form version 1.4