Research Journal of Optics and Photonics

Editorial

a SciTechnol journal

Quantum Cryptography

Calvin MFC

Faculty of Food Science, Department of Physics and Control, 14-16 Somlói str., Budapest 11287, Hungary

Introduction

Quantum cryptography, or quantum key distribution (QKD), uses a series of photons (light particles) to transmit data from one location to a different over a fiber optic cable. ... The photons visit a receiver, which uses two beam splitters (horizontal/vertical and diagonal) to "read" the polarization of every photon. One of the earliest discoveries in quantum computation and quantum information was that quantum physics are often wont to do key distribution in such how that Alice and Bob's security can't be compromised. This procedure is understood as quantum cryptography or quantum key distribution (abbreviated QKD). Quantum cryptography attributes its beginning by the work of Stephen Wiesner and Gilles Brassard

In the early 1970s, Wiesner, then at Columbia University in ny , introduced the concept of quantum conjugate coding. His seminal paper titled "Conjugate Coding" was rejected by the IEEE scientific theory Society, but was eventually published in 1983

Usage of cryptography

Quantum cryptography may be a general subject that covers a broad range of cryptographic practices and protocols.

Quantum cryptography and its uses within the applications like Key Agreement, encoding and Digital Signature.

Quantum cryptography could rather be the primary application of quantum physics at the single-quantum level.

The system, referred to as SECOQC (Secure Communication supported Quantum Cryptography), will function a strategic defense against the Echelon intelligence gathering system employed by the us , Australia, Britain, Canada and New Zealand.

Quantum key distribution

The best-known and developed application of quantum cryptography is quantum key distribution (QKD), which is that the process of using quantum communication to determine a shared key between two parties

Principal of Quantum cryptography

Cryptography is that the study and practice of techniques for secure communication within the presence of third parties called adversaries. Data Confidentiality, Data Integrity, Authentication and Non-repudiation are core principles of modern-day cryptography

Limitations

Transmission Rate

The rate of transmitting data/key is a smaller amount as compared to classical methods. the most reasons for the slow transmission rate are:

• Recovery time of detector – The detector needs time to recover after detecting a photon before it can correctly detect subsequent photon.

• In order to avoid "beam splitting" attacks by an eavesdropper, the mean photon number per pulse should be small.

• Losses in transmission also reduce the info that get effectively transmitted and hence reduce the transmission rate.

• Error correction and privacy amplification procedure further reduce the quantity of knowledge transmitted securely and hence reduce the transmission rate.

Limit On the space

The maximal distance over which secure Quantum key exchange are often established decreases with increasing losses and increasing detector noise. Standard amplification can't be used as they might affect the states of photons during a similar manner as eavesdropping. Present-day technology allows secure operation up to about 100km.

Denial Of Service

The Quantum key exchange might be made impossible by an eavesdropper who would continuously introduce errors within the transmission by measuring the photons being transmitted.

Technology

Quantum transmission requires a requirement for a fanatical fiber, transmitters and detectors which make it expensive. this is able to be limitation to its deployment in normal scenarios.

Conclusion

Quantum Cryptography could theoretically be wont to achieve totally and provably secure communication where the adversary cannot decipher the communication no matter the quantity of computing power and time available at their disposal.

***Correspondingauthor:**Calvin MFC,Faculty of Food Science ,Department of Physics and Control,14-16 Somlóistr.,Budapest11287,Hungary,E-mail:calvinmaest@gmail.com

Received date: March 05, 2021 Accepted date: March 21, 2021 Published date: March 29, 2021