

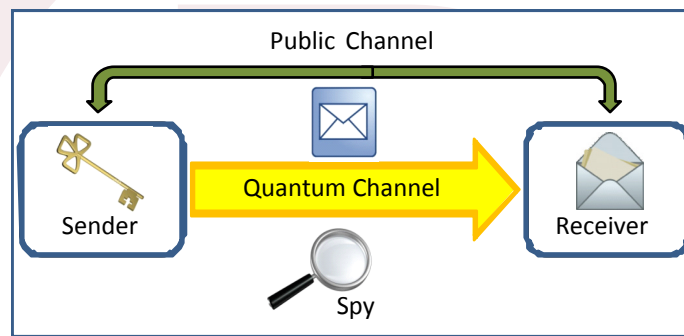
A NEW QUANTUM KEY DISTRIBUTION TECHNIQUE FOR SECURE COMMUNICATION

DESCRIPTION OF THE INVENTION

The revolution in Information and Communication Technology in recent years has created the need for adequate security measures that guarantee effective protection in terms of communication and user rights.

The invention contains a communication protocol for exchanging a key used for coding information at a high security level, as well as the equipment for implementing the system.

The protocol proposes the distribution of the quantum key based on the combination of the frequency modulation (FM) technique and the differential phase technique (DPSK). Its characteristics allow it to be more robust, use less complex equipment and have a higher quantum key transfer rate.



BUSINESS SECTOR APPLICATION

The patented technology can be found within the framework of communications systems and more precisely in quantum key distribution or quantum cryptography (QKD). Consequently, the study developed by researchers at the UPV is of particular interest for communications security in banking applications, the transmission of election (voting) results or electronic signatures, as well as for military and aerospace applications. For all of these sectors, communication security is essential.

The performance of this type of protocol is extremely low, and it is therefore reserved for establishing high security encrypted communication. In the future it will most likely be used for other kinds of communication.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The technology currently used for this type of communication is the BB84 protocol. For use in research, one solution is the DPSK technique – Differential Phase Shift Key Modulation, which has not been exploited in the market due to its high level of complexity.

The main advantages of the new technique patented by the UPV with regard to BB84 are a radical reduction in the degree of complexity of the receptor, which becomes passive, a higher rate of transmission, which is doubled and higher security, which results in a greater distance between the transmitter and the receiver.

In comparison to the conventional DPSK, this new technique allows for greater stability, security and robustness, is less complex and more cost effective, due to the fact that it uses a modulator as its interferometric structure instead of a conventional optical interferometer.

The fact that the receiver is simpler means the capacity for extending this technology to several users is more competitive, implying a reduction in cost and subsequent maintenance.

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DEVELOPMENT STAGE OF THE TECHNOLOGY

In addition to having developed the mathematical formulation, the project team is currently working on a conceptual testing of the technology, whose results demonstrate the viability of the technique through the development of an experimental prototype.

INDUSTRIAL PROPERTY RIGHTS

The Universitat Politècnica de València requested the patent on 14th March, 2012 in the Spanish Office of Patents and Brand Names. The request is registered under the number P201230385.

The internationalization process has begun by requesting the PCT, PCT/ES2013/070157.

REQUIRED COLLABORATION

The Universitat Politècnica de València is looking for firms interested in establishing licensing agreements of the patent and in commercializing the system.

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