

New Directions Of Information Transmission In The Sphere Of Telecommunications

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Abstract: *Technological progress in the field of telecommunications does not stand still. Intelligent combined optical links and networks do a good job of transmitting digital information and voice messages in airborne and ground communication systems. At the same time, technical devices have recently appeared that make it possible to intercept information transmitted over fiber optic communication lines (FOCL) in an unauthorized way.*

Keywords— Technological, FOCL, Moreover, transmission.

1. INTRODUCTION

Quantum communication is a collection of methods for transferring encoded information in quantum states from one point to another. Quantum communication makes it possible to transfer information in encrypted form [1]. The main idea of quantum cryptography is that messages are completely encrypted, which makes it impossible for third parties to intercept it. Each transmitted message contains its own unique secret key. Moreover, the absolute secrecy of the transmitted information is provided not by computing and technical capabilities, but by the laws of nature. When transmitted, data is encoded in quantum states of photons.

2. MAIN PART

Signals are transmitted using a stream of single photons. A photon cannot be divided, measured, copied, or subtly removed. Because of such actions, the photon is simply destroyed and cannot reach its recipient. If you try to hack such a communication channel, the states of the photons at its two ends will change simultaneously, making it impossible to spy on the transmitted data - these are the laws of quantum physics. At this, the hacking attempts will stop, and the participants in the communication session will know that they were being eavesdropped. So attackers will not be able to remain unnoticed. There are other benefits to quantum (or qubit) coupling. She does not depend on the distance; she is not afraid of any interference associated with the weather. In terms of data transmission speed, such networks are several orders of magnitude higher than the fastest of the currently known communication channels. And even a quantum phone does not need towers, repeaters and other infrastructure of modern cellular networks. Quantum communication is just beginning to develop.

Therefore, scientists and developers have to face some challenges. The main problem is financing. The study and development of quantum communication lines requires large investments. And while the network is not fully understood, there is practically no return on these investments. But the governments of the countries are well aware of the prospects

that quantum communication opens up, and therefore do not spare finances for its development. Another problem is the fact that a bit can only be copied once. This means that information can only be transmitted via a quantum communication channel. And then you won't be able to do anything with it. At the moment, scientists are trying to solve this problem. So, now they are trying, using quantum communication technologies, to create entangled pairs of photons. With their help, it will be possible to send to two ends from one point and link two distant points together. If you create many such nodes, then it will be possible to organize a communication line over infinitely large distances. But to implement the idea, quantum memory is also required. Quantum communications open up new opportunities in the field of data transmission and protection [2].

Among the promising areas for developments in the field of quantum communications:

1. Quantum block chain. Today, a block chain platform has already been developed, within which quantum key distribution can be used. Under certain network configurations, this makes it possible to abandon block chain elements that are vulnerable to attacks using a quantum computer [5].

2. The quantum Internet, the main advantage of which will be complete communication security. First of all, such a secure network is necessary for the financial sector, government agencies and the military sphere, since they have the highest need for secure data transmission [6].

3. Security technologies based on quantum communications: for example, quantum-protected signatures for individuals.

4. Transmission of energy at a distance. The possibility of collecting and transferring energy using quantum technologies is based on the idea that in quantum teleportation, measurement on the first particle introduces quantum energy into the system. It is assumed that by carefully choosing the measurement for the second particle, the original energy can be extracted. This is possible because there are quantum fluctuations in the energy of any particle.

The teleportation process allows you to inject quantum energy into one point in the universe, and then use quantum energy vibrations to extract it from another point. Of course, the energy of the system as a whole does not change [7].

5. Wireless optical communication in open space and over long distances. It is based on the principle of quantum teleportation.

3. REFERENCES

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