

A way has been found to make a quantum connection safe without perfect equipment

Scientists of the Jewish University in Jerusalem, together with the Los Alamos National Laboratory, took a step towards the practical use of quantum communications. They showed that for reliable encryption, expensive and almost unattainable “ideal” sources of photons are not needed.

The essence of quantum cryptography is that the information is transmitted using individual particles of light – photons. For a long time it was believed that for this we need devices that produce exactly one photon at a time. But such sources are difficult and expensive to create. In practice, lasers are more often used that emit an accidental number of photons. This is convenient, but reduces safety: an attacker can intercept part of the signal.

The team under the leadership of Professor Ronen Rapaport proposed another decision. They used quantum points – miniature semiconductor crystals that behave as artificial atoms. With their help, you can manage how photons are emitted.

Scientists have developed two new methods:

- **Modified** Decoy State protocol – cuts off attempts at hacking associated with multiple transmission of photons.
- **Protocol** Signal cleaning – in real time filters “extra” photons, leaving only single.

The experiments showed that these approaches are more reliable and allow you to transmit data further than traditional methods based on lasers. The main advantage is that such technologies can be introduced now using equipment available to many laboratories.