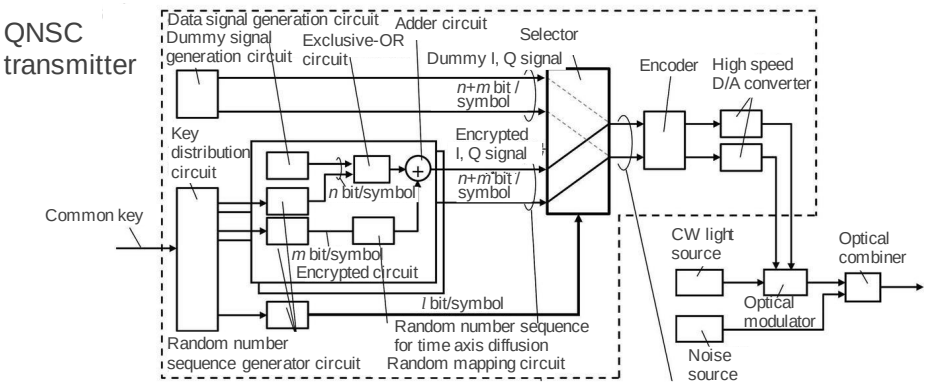
Tohoku Univ. Technology

Optical secure communication system and device

Random number sequence used for encryption is also encrypted to achieve both high security and high speed

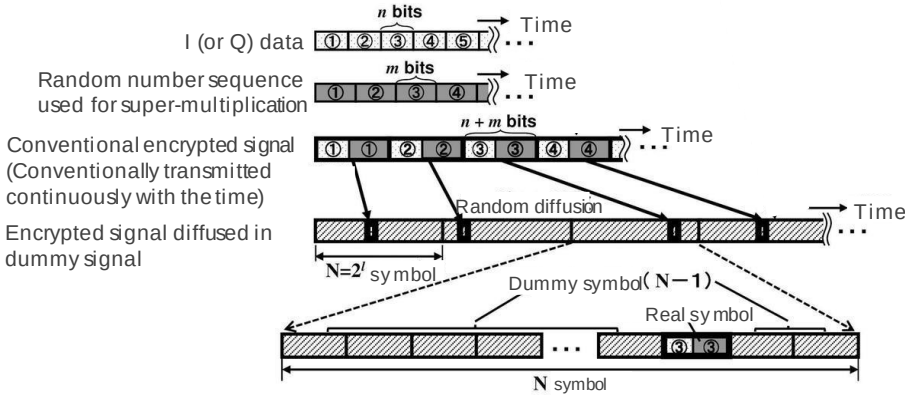


Overview

In recent years, with the development of internet-based business, personal and confidential information are transmitted through optical communication network. It is becoming important to ensure the information security as the optical communication network increases in speed and capacity. Quantum Noise Stream Cipher (QNSC), which uses the quantum noise in light, is known as a physical layer optical cryptography with a high transmission speed. However, since it uses strong optical signal, it cannot achieve the perfect masking effect by quantum noise, so there is a possibility that some information in the random number sequence used for encryption is leaked to an eavesdropper.

This invention is able to provide an optical secure communication system and device that are more secure and capable of high-speed transmission than the conventional QNSC by spreading the QNSC signal on the time axis. In the present invention, the QNSC signal is spread over time using a common key at the transmitter, and the timing of the received QNSC signal is corrected by using the common key shared in advance at the receiver. It is thus possible to achieve the optical secure communication with higher security and higher speed by also encrypting the random number sequence used for encryption.

QNSC signal is spread over time to ensure safety and high speed



Product Application

- Any coherent optical communication system

IP Data

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