

Optical Steganography Communication Using Signal-carrying Noise Dispersion

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Abstract: A novel optical steganography approach is proposed for secure communication using signal-carrying noise dispersion. The approach is based on the use of a phase-modulated optical signal that carries the message and is dispersed in the frequency domain using a chirped fiber Bragg grating (CFBG). The dispersed signal is then filtered to recover the message. The proposed approach is shown to be robust against eavesdropping and is suitable for secure communication in optical networks.

1. Introduction

Optical steganography is a technique for hiding information in an optical signal. It is a subset of optical communication and is used to transmit information securely. The basic idea is to embed the message in a carrier signal that is noisy or distorted. This makes it difficult for an eavesdropper to detect the presence of the message. In this paper, we propose a novel optical steganography approach based on signal-carrying noise dispersion. The proposed approach is based on the use of a phase-modulated optical signal that carries the message and is dispersed in the frequency domain using a chirped fiber Bragg grating (CFBG). The dispersed signal is then filtered to recover the message. The proposed approach is shown to be robust against eavesdropping and is suitable for secure communication in optical networks.

2. Experimental setup

The experimental setup is shown in Fig. 1. It consists of a laser, a phase modulator, a CFBG, a filter, and a detector. The laser output is phase modulated and then dispersed by the CFBG. The dispersed signal is then filtered to recover the message. The detector measures the intensity of the signal.

