Budowa Silesia Photonics

Optical Cable Intelligent Sensing System

Overview

Figure 1 depicts the operating principle of the proposed ISAC-OF, which is composed of a signal transmitter, fibre link, and signal receivers. In the signal transmitter, an LFM optical carrier is first generated with SSB modulation. Subsequently, the tr. Figure 1 depicts the operating principle of the proposed ISAC-OF, which is composed of a signal transmitter, fibre link, and signal receivers. In the signal transmitter, an LFM optical carrier is first generated with SSB modulation. Subsequently, the transmission code with PAM4 format is loaded onto the LFM optical carrier to generate the transmiss. The experimental setup of the ISAC-OF is shown in Fig. 2. A continuous-wave laser (CWL) with ultra-narrow linewidth (NKT Koheras Basik X15, linewidth <0.1 kHz) acts as the laser source. The centre wavelength and the output power of the laser are 1549.5 nm and 13 dBm, respectively. The CW light is split into two branches by a 90:10 optical coupler (. The transmission performance of the proposed ISAC-OF has been measured under different launching powers, received powers, and LFM bandwidths. For comparison, the conventional single-carrier 56 Gbit/s PAM4 transmission is also performed under back-to-back (B2B) and 24.5 km conditions. Figure 3a shows the BER evolution with the increment of the recei. In addition to the transmission performance, the sensing performance of the ISAC-OF is also tested. A 56 Gbit/s PAM4 signal is first loaded on a 1 GHz LFM optical carrier, and the transmission light with 15 dBm launching power is launched into the fibre. In the experiment, a 5 m bare fibre is coiled around a PZT at a 22.5 km location. A sinusoidal.

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