

Temperature-independent chirped FBG pressure transducer with high sensitivity

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ABSTRACT

High sensitivity pressure transducer is always in demand in many industrial applications. In this paper, a highly sensitive temperature discriminated pressure transducer based on the use of natural rubber diaphragm and chirped fibre Bragg grating (CFBG) is proposed and demonstrated. The sensing mechanism is based on the measurement of bandwidth change and total reflection power. Results showed that the use of rubber diaphragm enhanced the sensitivity, which was experimentally obtained at -276.7 pm/kPa. Furthermore, the pressure transducer was temperature insensitive and cost-effective due to the simple demodulation technique.

KEYWORDS:

Fibre Bragg grating (FBG); Chirped FBG; Pressure sensor; Temperature compensation