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Hot-wire anemometer based on fiber Bragg grating coated with carbon conductive paint

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Abstract

Hot-wire anemometers are sensors used to measure wind speed via the principle of thermal equilibrium. They are attributed to the issue of probe contamination, requiring regular maintenance, causing inaccurate measurements. A hot-wire anemometer based on FBG coated with carbon conductive paint is proposed. 2 mm coating is applied on the FBG grating region using brushing method. The sensitivity of the proposed anemometer is 0.0410 nm / (m/s) in the temperature range of 60 °C to 150 °C, at wind speeds of 0 m/s, 4.55 m/s, 4.86 m/s and 5.02 m/s. The FBG is proven to possess increased sensitivity towards temperature, improving its thermal anemometry capabilities. © 2025, National Institute of Optoelectronics. All rights reserved.

Author keywords

Carbon conductive paint; Fiber Bragg grating; Hot wire anemometer; Optical sensor; Wind sensor

Indexed keywords

Engineering controlled terms

Anemometers; Carbon; Optical sensors; Wind; Wire

Engineering uncontrolled terms

Brushing methods; Carbon conductive paint; Conductive paints; Fiber Bragg; Grating region; Hot wire anemometers; Optical-; Thermal-equilibrium; Wind sensors; Wind speed

Engineering main heading

Fiber Bragg gratings

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