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Online Structural Health Monitoring of Wire Rope by Fiber Optic Low Coherence Interferometric Sensor

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In this paper we use an intrinsic fiber-optic sensor for detection of acoustic-emission (AE) events occurring in the metal rope. Basic principle of operation is low-coherence interferometry performed as an "all-in-fiber" Michelson interferometer. The core part of the sensing setup is 3x3 coupler made of single-mode optical fiber operating at 1300nm of light wavelength. The coupler provides a passive stabilization of the interferometric signal by generation of two quadrature signals. The sensing element is made of fiber-optic coil of 25mm in diameter, wrapped around the AI disk that is bonded to the rope. We tested a metal rope of 5mm in diameter and length of 1000mm. The rope has been loaded in a metal frame till to about 4000kN.

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Ключевые слова:

Содержание.

Abstract
Introduction
Principle of operation
Experiment
Results and discussion
Conclusion