

Experiment on measuring rotational speed using a fiber optic sensor



Overview

In this paper, we demonstrate a fiber-based configuration on rotational Doppler measurements for the detection of a rotational object using an ultra-broadband mode-selective coupler to convert the superposed vortices. This paper provides an overview of basic approaches and a review of current state-of-the-art in fiber optic sensors for measurements of torsion, twist and/or rotation. Keywords: fiber optic sensors, twist sensors, rotation sensors, circular birefringence, linear birefringence, FBG, tilted FBG, long. Abstract: In this paper, a fiber optic sensor system (FOSS) is proposed for the measurement of the rotational speed of a DC motor. It offers non-contact measurements. FODS is an intensity modulation based extrinsic type sensor. In. Light emerging from the optical fiber is analyzed with respect to its change in phase to determine the periodic variation in the magnetic field caused by the toothed wheel. G01D5/344 Mechanical means for transferring the output of a sensing member; Means for converting the output of a sensing. The effect of the angular velocity on the interference pattern of Mach-Zehnder interferometer by using Sagnac effect had been investigated in this study. LDV, for instance, is widely used for vibration and velocity measurements in rotating systems

due to its. However, the presently proposed detection techniques based on the rotational Doppler effect are generally configured relying on discrete components in free space, resulting in cumbersome and inflexible systems, which brings challenges to practical applications.

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Here we report the first all-fiber rotational Doppler velocimetry (AF-RDV) with a single probe based on a fabricated mode-sculpted fiber-optic element.



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In these configurations, conventional fiber-optic strain sensors (mostly FBGs) are applied to measure directly the shear stress at the surface of the measurement body, while this measured stress is then ...



The speed, torque and power of a rotating shaft has been fabricated and tested. The sensor provides a direct measurement of shaft rotation. speed and shaft angular twist, from which torque and power.



A vision- and fringe pattern-based rotational speed measurement system was proposed to measure the instantaneous rotational speed (IRS) with high accuracy and reliability.



Research in quantum metrology has paved the way for next-generation rotational measurement devices capable of surpassing the fundamental precision limits of conventional optical sensors.



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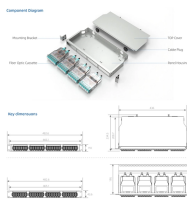
Here we report the first all-fiber rotational Doppler velocimetry (AF-RDV) with a single probe based on a fabricated mode-sculpted fiber-optic element.



In this paper, a fiber optic sensor system (FOSS) is proposed for the measurement of the rotational speed of a DC motor. FOSS is designed using a fiber optic displacement sensor...



A highly precise rotation sensor may be used to measure any changes in the length of the day and to detect torsional oscillations in the earth caused by earthquakes.



This study proposes an optical rotational speed measurement method based on the OCDM technique and establishes a sensing model between rotational speed and optical coherence ...



It is seen, from this description, that the arrangement remains identical to that of the fiber with a phonic wheel in such a way that the sensors according to the invention can easily replace...



The effect of the angular velocity on the interference pattern of Mach-Zehnder interferometer by using Sagnac effect had been investigated in this study. This interference pattern was produced from the ...

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