Function of Magnetic Ring Fiber Optic Sensor

Overview

In this paper, based on a ring-shaped structure, an intensity demodulation fiber-optic sensor is explored and experimental verified. The Higher Educational Key Laboratory for Flexible Manufacturing Equipment Integration of Fujian Province, Xiamen Institute of Technology, Xiamen 361021, China The State Key Laboratory for Mechanical Manufacturing Systems Engineering, Xi'an Jiaotong University, Xi'an 710054, China Shandong. Here we propose a high-resolution fiber ring magnetometer based on laser frequency stabilization technology. By connecting one output port to an input port of a fiber coupler with a splitting ratio of 1:99, the fiber ring resonator (FRR) generates a series of highly narrow transmission resonances. A magnetic field sensing system based on a phase-shift fiber loop ring-down (FLRD) technique and multi-mode interferometer (MI) coated with magnetic fluid (MF) is proposed and demonstrated. A sensitivity of 1306 pm/mT was experimentally demonstrated in the range of magnetic fields from 0 to 15 mT.

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