1. Record Nr. UNINA9911039312103321

Autore	Liao Yanbiao
Titolo	Fiber Optic Interferometer : Fundamentals and Applications / / by Yanbiao Liao, Min Li, Wu Kuang
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2025
ISBN	9789819525584 9789819525577
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (347 pages)
Collana	Springer-TUP Physics Series, , 3091-3020
Disciplina	621.3692
Soggetti	Fiber optics Optoelectronic devices Measurement Measuring instruments Materials Detectors Fibre Optics Optoelectronic Devices Measurement Science and Instrumentation Sensors and biosensors
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Optical interference -- Transmission and control of polarized light in an optical fiber -- Types and optical characteristics of optical fiber interferometer -- Signal processing of the optical fiber interferometers -- Typical fiber-optic interferometers.
Sommario/riassunto	This book highlights the key technology of fiber optic interferometers (FOI), providing a systematic overview of their principles and applications. FOI is among the first fiber optic sensors to achieve engineering applications due to its ultra-high sensitivity, yet challenges such as temperature drift and instability persist. Starting with the wave and coherence theories of light, the book explains the transmission and control of polarized light in optical fibers. It then covers the optical characteristics of major FOI types and introduces recent developments

in short-cavity FP interferometers, white light interference, and long-range interferometers. The book also classifies and discusses holistic signal processing technologies for different types of interferometers. Furthermore, it presents in-depth analyses of several commercialized fiber optic sensors, including fiber underwater acoustic sensors (hydrophones), fiber vector/acceleration sensors, and fiber gyroscopes. Practical designs for a fiber hydrogen sensor and a refractive index sensor combining fiber gratings with Mach-Zehnder interferometers (LPG-MZ) are also included. This comprehensive resource is intended for students, engineers, and practitioners in the field.