

Polydimethylsiloxane Applications in Interferometric Optical Fiber Sensors

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Abstract : This review paper consists of applications of PDMS (polydimethylsiloxane) materials for enhanced performance, optical fiber sensors in acousto-ultrasonic, mechanical measurements, current applications, sensing, measurements and interferometric optical fiber sensors. We will discuss the basic working principle of fiber optic sensing technology, various types of fiber optic and the PDMS as a coating material to increase the performance. Optical fiber sensing methods for detecting dynamic strain signals, including general sound and acoustic signals, high frequency signals i.e. ultrasonic/ultrasound, and other signals such as acoustic emission and impact induced dynamic strain. Optical fiber sensors have Industrial and civil engineering applications in mechanical measurements. Sometimes it requires different configurations and parameters of sensors. Optical fiber current sensors are based on Faraday Effect due to which we obtain better performance as compared to the conventional current transformer. Recent advancement and cost reduction has simulated interest in optical fiber sensing. Optical techniques are also implemented in material measurement. Fiber optic interferometers are used to sense various physical parameters including temperature, pressure and refractive index. There are four types of interferometers i.e. Fabry-perot, Mach-Zehnder, Michelson, and Sagnac. This paper also describes the future work of fiber optic sensors.

Keywords : fiber optic sensing, PDMS materials, acoustic, ultrasound, current sensor, mechanical measurements

Conference Title : ICCCISE 2015 : International Conference on Computer, Communication and Information Sciences, and Engineering

Conference Location : Jeddah, Saudi Arabia

Conference Dates : January 26-27, 2015