

ANALYSIS OF WAVELENGTH SHIFT IN FBGS ON EXTERNAL PERTURBATION

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ABSTRACT

Engineering structures stability depends largely upon the magnitude of parameters like strain, temperature, pressure, chemical and biological effect of environment. Fiber Bragg Grating(FBG) sensor technology has become one of the most rapidly progressing sensing topics of this decade in the field of optical fiber sensors. FBG sensors are currently emerging from the laboratory to find practical applications. Rapid progress has been made in both sensor system developments and applications in recent years. FBG have been applied to sense a number of physical measurements including strain, temperature, pressure, magnetic field, etc. These applications are based on the same principle i.e. the measurement of Bragg wavelength shift caused by the measurands. In this paper we have studied the shift in Bragg wavelength due to change in the grating pitch. The wavelength shift in FBG on simulated external perturbation using a wideband source has been observed. Since the strain or temperature measurement are encoded into wavelength shifts, so by comparing Bragg's wavelength shift with the reference Bragg's wavelength strain or temperature can be calculated.

KEYWORDS: Bandwidth, Fiber Bragg Grating, Sensor, Simulation