MODELING AND SIMULATION OF FIBER BRAGG GRATING USING GRAPHICAL USER INTERFACE

Chandralekha M
M-Tech in Instrumentation & Control, Electrical & Electronics Engineering Department
NIT, Calicut
Kerala, India

Abstract: In the field of acoustic detection, piezoelectric sensors are the most widely used devices. This technology offers high reliability and relatively low cost of production. Sensors based on optical fibers have well known advantages over conventional electro-mechanical sensors. They offer electrically passive operation and immunity from electromagnetic fields. They have very small dimensions, and have multiplexing capabilities for a quasi-distributed measurement configuration, by using a single opto-electronic control unit. With the development of optical communications and optical sensing technologies, fiber Bragg grating (FBG) has become the key sensing component in various fields for its prominent advantages and potential industrial applications. As sensors, FBG could measure strain, temperature, and other physical parameters through the mechanical transducers. FBG is a new type of optical fiber device, which is rapidly developed in recent years. FBG is the grating in which the refractive index is periodically distributed in the bare optical fiber, with the advantages of all-fiber-based, low insertion loss, low cost, small size, and by designing some structures can meet specific need of a variety of spectral characteristics. Thus it shows broad application prospect in the areas of optical fiber communication, optical fiber sensing and optical information processing. FBG has very board application in the field of acoustic signal detected underwater, which with the advantages of anti-electromagnetic interference, wide dynamic range, small size, all-optical transmission ease to be multiplexed, etc., can be carved in different ways to achieve multi-point distributed measurement underwater, making hydrophone array more convenient, especially in the thin array drag. This work deals to accomplish a mathematical model for the simulation of the spectral characteristics that can be achieved in fiber reflection and transmission gratings.