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$\text{Bi}_{12}\text{GeO}_{20}$ Faraday crystal application in magnetic field measurement

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Faraday crystals (FC) have been under intense investigation in magnetic field sensing applications for several decades due to several desirable properties, but mostly due to low interaction with magnetic field that does not disturb the field during measurement. FC requires an optical carrier to sense the magnetic field since interaction of the field and light in the crystal affects the state of polarization of the light. Development of production technology for optical fibers for mass use in telecommunication industry has made design of fiber-optic magnetic field sensor (FOMS) based on Faraday crystal an interesting research field. A class of diamagnetic materials known as sillenites of which BiGeO is an interesting example has been used to sense magnetic field in optical sensor in various configurations and adopted to various applications. This paper will discuss an extrinsic, fiber optic, magnetic field sensor, designed for direct point magnetic field measurement constructed using $\text{Bi}_{12}\text{GeO}_{20}$ crystal. A configuration suitable for measurement will be presented together with analyses of the test results obtained from a calibrated magnetic field setup. Compensation of temperature effect on magnetic field measurement will be presented and its implication will be discussed.

Biography

Slobodan J Petricevic completed his BSc in Electrical Engineering (EE) in 1996; MSc in EE in 2001 and; PhD in EE in 2007 at School of Electrical Engineering, University of Belgrade, Serbia. His field of research is Optoelectronic and Fiber Optic Instrumentation. He has published 18 scientific papers in SCI listed journals with 105 citations and two patents. He is currently employed as an Associate Professor at School of Electrical Engineering since 2008.

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