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## APPLICATION OF OPTICAL FIBER IN MAGNETIC RESONANCE

**Dr. Ajay Rana\* ; Dr. Shiva Sharma\*\***

\*Shobhit Institute of Engineering and Technology,  
 (Deemed to be University), Meerut, INDIA  
 Email id: ajay.rana@shobhituniversity.ac.in,

\*\*School of Biomedical Engineering,  
 Faculty of Engineering and Technology,  
 Shobhit Institute of Engineering and Technology,  
 (Deemed to be University), Meerut, INDIA  
 Email id: shiva@shobhituniversity.ac.in

### ABSTRACT

*Due to a rising need for applications in medicine, Magnetic Resonance (MR)—compatible sensors based on various methods have been developed during the past several decades. There are a number of technical options for creating MR-compatible sensors, but the one based on optical fibers has a number of advantages. The high elasticity and small size allow miniaturized fiber optic sensors (FOS) to be designed with metrological characteristics (e.g., accuracy, sensitivity, zero drift, and frequency response) suitable for most common medical applications; the immunity to electromagnetic interference and the lack of an electrical connection to the patient make FOS suitable for use in high electromagnetic fields. These two characteristics increased the potential function of FOS in medicine, making them particularly appealing for use in MRI. This article gives an overview of MR-compatible FOS, with an emphasis on the sensors used in medicine to measure physical characteristics (i.e., temperature, force, torque, strain, and position). The operating principles of the most promising FOS are examined in terms of their respective benefits and drawbacks, as well as their medical applications.*

**KEYWORDS:** *Fiber Optic Sensors, Fiber Bragg Grating MR-Compatibility, MRI Interferometry, Sensor.*

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