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Fiber Optic Sensors Based on Plasmonics

By **Ramki Dhar Gupta** (Indian Institute of Technology Delhi, India)
Sachin Kumar Srivastava (Ben Gurion University of the Negev, Israel)
Ravi Verma (Indian Institute of Technology Delhi, India)

The book provides an introduction of surface plasmons and presents its applications in the sensing of various chemical and biological analytes using optical fiber technology. The field is developed by introducing the surface plasmons for semi-transparent metal-dielectric interface with discussion of their propagation length and penetration depth. Practical issues with the excitation of surface plasmons in different configurations and in various geometries including various means of their excitation have also been included. The book discusses the essential components of fiber optic sensors, their functions and the performance parameters along with the theoretical description of fiber optic Surface Plasmon Resonance (SPR) sensors with respect to various light launching conditions. The fabrication methods and protocols used for the fabrication of the fiber optic SPR (chemical and biological) have been described. Some fiber optic sensing applications based on SPR phenomena and various methods, such as sensitivity enhancement, influence of thermal stimuli etc. have been an important part of the book.

The book will help beginners as well as established researchers in understanding the fundamentals and advancements of optical fiber plasmonic sensor technology. The book contains both the rigorous theory and the experimental techniques of SPR and related variety of sensors.

Contents:
Introduction; Physics of Plasmons; Characteristics and Components of Fiber Optic Sensor; Theory of SPR-based Optical Fiber Sensor; Fabrication and Functionalization Methods; SPR based Sensing Applications; SPR based Fiber Optic Sensors Factors Affecting Performance; Future Scope of Research; Appendix: Dispersion Relations of Dielectric Materials and Metals; List of Contents

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Readership:
Beginners as well as established researchers who are interested in the fundamentals and advancements of optical fiber plasmonic sensor technology.

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