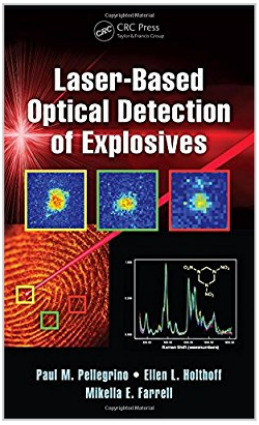

Laser-Based Optical Detection of Explosives (Devices, Circuits, and Systems)

From CRC Press

Laser-Based Optical Detection of Explosives (Devices, Circuits, and Systems) From CRC Press

Laser-Based Optical Detection of Explosives offers a comprehensive review of past, present, and emerging laser-based methods for the detection of a variety of explosives. This book:

- Considers laser propagation safety and explains standard test material preparation for standoff optical-based detection system evaluation
- Explores explosives detection using deep ultraviolet native fluorescence, Raman spectroscopy, laser-induced breakdown spectroscopy, reflectometry, and hyperspectral imaging
- Examines photodissociation followed by laser-induced fluorescence, photothermal methods, cavity-enhanced absorption spectrometry, and short-pulse laser-based techniques
- Describes the detection and recognition of explosives using terahertz-frequency spectroscopic techniques

Each chapter is authored by a leading expert on the respective technology, and is structured to supply historical perspective, address current advantages and challenges, and discuss novel research and applications. Readers are left with an in-depth understanding and appreciation of each technology’s capabilities and potential for standoff hazard detection.

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Editorial Review

Review

"... possibly the most comprehensive review to date of past, current, and emerging laser-based methods for the detection of explosives. ... provides in-depth discussion of the various laserbased detection technologies, each chapter being a summary of recent peer reviewed publications, with case studies for each technology as well as data analysis and interpretation. There is a particular focus on the use of laser technology for stand-off detection, which is very much the new Eden for next generation explosive detectors, and the book clearly lays out the challenges of such ambitions, as well as reasons why laser technologies are a solution. These chapters alone provide worthwhile reading for anyone involved in homeland security who wants to gain an understanding of the basic issues of explosives detection in the post 9/11 era. ... Expert authors from academia, national laboratories, and commercial research institutions, all well known within their respective fields, have written each chapter independently and provided comprehensive references. ... This book is ideally suited to post-graduate or doctoral researchers looking to better understand their own and related fields across laser detection, and provides a good grounding in unfamiliar areas of research within laser detection of explosives. In summary, it comprises an extremely useful reference tool for anyone working in the field of optical detection, including those from government and industry, and those tasked with educating decision makers."
?Andrew Johnston, from *CBRNe World,* August 2015

"… provides not only a scientific overview of the various optical methods currently employed, but also an overview of the problem from respected experts with first-hand knowledge."
?Brian M. Cullum, University of Maryland Baltimore County, USA

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About the Author

Paul M. Pellegrino is chief of the Optics and Photonics Integration Branch in the Sensors and Electron Devices Directorate at the United States Army Research Laboratory (ARL), Adelphi, Maryland. He has been with the ARL as a physicist for 17 years. In addition to his branch chief duties, he actively participates in numerous spectroscopic efforts for hazardous material sensing. He has more than 20 years of experience in optics, physics, and computational physics, with an emphasis on the application of novel spectroscopy and optical transduction for chemical and biological sensing. Widely published, Dr. Pellegrino is a member of the OSA, SPIE, and SAS.

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Mikella E. Farrell is a research chemist in the Sensors and Electron Devices Directorate at the United States Army Research Laboratory, Adelphi, Maryland, where her work has included developing SERS substrates for army-specific biological and hazard sensing, biomimetic hazard sensing employing designed peptides, the fabrication of a nanoscale SERS imaging probe, and transitioning a standardized technique for the fabrication of drop-on-demand hazard test evaluation coupons. She also has been involved with supporting Defense Advanced Research Projects Agency SERS Fundamentals programs, university SERS-based research programs, and the evaluation of fielded standoff hazard detection systems. She is widely published and holds a United States patent.

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