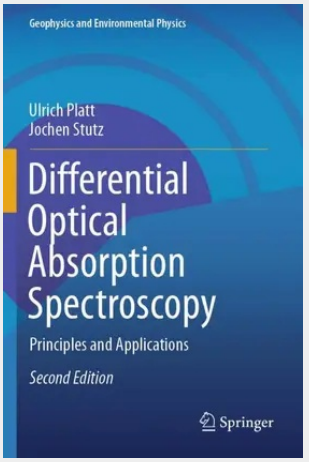
Platt / Stutz

Differential Optical Absorption Spectroscopy

Principles and Applications



This second edition of (DOAS) has been meticulously updated to enhance its clarity and relevance. Responding to the growing popularity of DOAS techniques, this edition expands the sections on atmospheric radiative transfer, covering new and crucial topics such as the ring effect and profile inversion techniques. Additionally, the book presents a comprehensive array of DOAS applications and techniques, ranging from research applications using imaging and satellite DOAS to emission monitoring from volcanoes and industrial facilities by LED long-path DOAS, as well as mobile MAX-DOAS and Cavity-Enhanced DOAS. The discussion of DOAS retrieval algorithms has significantly broadened to incorporate the latest developments, particularly pertinent to the satellite community.

The first part of the book provides a thorough review of atmospheric chemistry, radiation transport, and optical spectroscopy fundamentals, serving as a crucial foundation for a detailed exploration of the principles underpinning DOAS. The subsequent part delves into the design, application, and assessment of DOAS instruments, accompanied by a comprehensive guide to result interpretation. The book also embraces the application of DOAS in imaging trace gas distributions through ground, aircraft, and satellite-based instruments.

Structured with the needs of graduate students and researchers with a foundational background in environmental physics in mind, this book serves as an invaluable resource. It particularly caters to researchers engaged in atmospheric chemistry, pollution monitoring, and volcanology.

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