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BOOK REVIEWS

Cavity Ring-Down Spectroscopy: Techniques and Applications. Edited by Giel Berden (FOM Institute for Plasma Physics "Rijnhuizen", Nieuwegein, The Netherlands) and Richard Engeln (Eindhoven University of Technology, Eindhoven, The Netherlands). John Wiley & Sons, Inc.: Hoboken, NJ.2009. xx + 322 pp. $199.00. ISBN 978-1-4051-7688-0.

This book presents a very nice snapshot of the current state of development of the nearly mature technique of cavity ring-down spectroscopy (CRDS) and gives valuable nods to variants of CRDS, e.g., ICOS, CEAS, etc., but does not go into great detail on their use, as is appropriate for a book on this subject. It also offers a nice update on advancements in the implementation of the CRDS concept and the ever-broadening sphere of applications based on the comprehensive but somewhat dated book by Busch and Busch. Many of the chapters provide useful summaries of the recent literature with sufficient references to allow a newcomer entry into the current (for now) thinking in the field.

Chapter 1 begins with a fairly opaque and dense history of CRDS followed by an approximately four-page discussion of other non-CRDS techniques that would not benefit spectroscopists, who would already know material, or novices, who would not have enough information to gain an understanding of them. The examples of applications in Chapter 1 also seem a bit out of place since they are not particularly easy to understand or broadly representative of CRDS experiments, although perhaps such examples do not exist in a field with as broad a range of applications as CRDS has demonstrated. Chapter 1 would have been more useful as a primer to the technique if it had been written more clearly and concisely and had provided a better introduction to the applications that are featured in the later chapters. Interestingly, Chapter 10, "Cavity Ring-Down Spectroscopy for Combustion Studies" provides a more useful introduction in many respects, introducing the topic from scratch and examining many of the technical but salient details that lead to a successful CRDS experiment within the context of applications to combustion.

Chapters 2, 3, and 5 on cavity-enhanced techniques using continuous wave lasers, broad-band CRDS, and CRDS using waveguides, respectively, are clear and well organized and provide broad coverage of the various strategies for implementation and key examples of their application. Chapters 4, 6, 7, 8, and 10 are on the applications of CRDS in various fields and are reasonably good about cross-citing where it is useful. In general, these chapters are internally consistent, although subtle changes in symbols and styles of description are present that may interfere with understanding by a nonexpert. Overall, these chapters fall into the trap of providing too much discussion of specific applications to be contained in a book centered on detection strategy but not enough detail of the overall subject at hand for a nonexpert to understand the subtleties involved. Chapter 9, "Studies into the Growth Mechanism of a-Si:H Using *in situ* Cavity Ring-Down Techniques", sticks out a bit as a fairly specific example of an application, although it does offer some interesting insight into the utility and challenges of doing both gas phase and condensed phase CRDS within the study of a single system.

In summary, this book is certainly a useful overview of the field, although I am not convinced that it is the right book to use in a course or to give to students new to this research area. It is undoubtedly a good reference to have in the lab where CRDS experiments are done. Given the wide range of areas where CRDS and its variants are being applied, it seems likely that this book will generate broad interest in the chemical (and other scientific) communities.

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