

Book Review

Advanced Applications in Acoustics, Noise and Vibration, Frank Fahy, John Walker (Eds.). Published by Spon Press/Taylor & Francis Group, London, UK (2004), pp. 1–640, £120.00, ISBN: 0415237297

As stated by the editors in the preface, this book is a companion volume to “Fundamentals of Noise and Vibration” published in 1998. It is based on material covered in courses given at ISVR, either elective modules of the second semester of the ISVR Masters programme “Sound and Vibration Studies”, or courses given in the annual ISVR short course “Advanced Course in Acoustics, Noise and Vibration”.

The book is divided into 13 chapters grouped in 4 parts:

Part I: Signal Processing (1 chapter)

Part II: Acoustic Modelling (3 chapters)

Part III: Environmental and Industrial Acoustics (4 chapters)

Part IV: Vibrations (5 chapters)

Overall the content is balanced between Acoustics and Vibration with a slight predominance of the first topic. Even though the title emphasises the word “Applications”, the text is also well balanced between conceptual aspects and more applied views.

No less than 19 authors have contributed to the present book. They are well-known experts in their field and most of them are associated with the ISVR. The main difficulty associated with a book written by so many authors is to obtain sufficient homogeneity between the contributions, their content and level. I am not sure that this objective has been completely achieved, and accordingly the book appears somewhat as a collection of relatively disconnected topics, even if some cross-references between the various contributions are made from time to time. Due to my limited competence in vibration, I will illustrate my views by taking some examples in the parts dealing with Acoustics and Noise.

There are some marked differences in the level of the various contributions. Some are clearly “advanced” texts giving a thorough presentation of the state of the art in the treated topic, together with an up-to-date list of references for further reading (this is for example the case of the chapter on “Source Identification and Location”). Others are more “pedagogical” in nature while maintaining a high standard of presentation (for example, the chapter on “Numerical Methods in Acoustics”). But some are in my opinion not of the right level. This is the case of the chapter entitled “Modelling of sound propagation in the ocean”. In this chapter the parabolic equation method, which is certainly the most efficient way to compute sound propagation in a complex environment, is hardly mentioned; the classical ray approach is presented in an old-fashioned style, essentially limited to stratified media, and the list of references is quite poor and restricted to relatively old books and papers.

From a more general point of view, if the choice of the covered topics can be considered as satisfactory (of course the content is necessarily biased by the competencies of the authors), the presentation of these topics can be criticized. For example, the methods used in ocean acoustic modelling are in large part the same as in sound propagation through the atmosphere, a subject which has received considerable interest recently. In my opinion it would have been preferable to write a chapter on sound propagation through nonhomogeneous media in general and to deal with applications to the atmosphere or the ocean in a second step. In the same vein it appears to me that the theme of “aerodynamic noise” is not properly treated in the book. The chapter on “Aircraft noise” is a good one, but the general approach on sound generated aerodynamically is hardly

treated. The Lightill/Curle theory and its refinements would have required a separate and in-depth treatment; this lack of a general presentation is especially annoying as this topic is not treated at all in the companion book “Fundamentals of Noise and Vibration”.

To conclude, “Advanced Applications in Acoustics, Noise and Vibration” is a compilation of contributions made by renowned experts in acoustics and vibration. It can be used as a reference and an entry point to various subjects when used in conjunction with its more elementary companion volume “Fundamentals of Noise and Vibration”. In my view it is however difficult to recommend it to students, even at the Masters level, due to its lack of homogeneity in the level of the various chapters. It stands at an intermediate position between textbooks and more specialised books and will therefore find its place in the libraries of universities and research centres in acoustics and vibration.

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