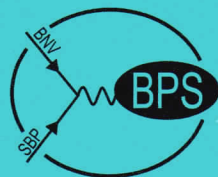


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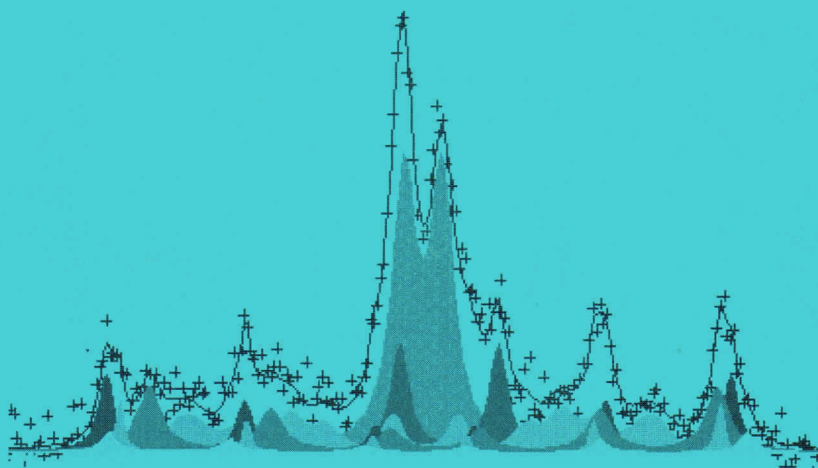
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As is usually the case with Springer books, these volumes have been beautifully printed, illustrated, and nicely bound for long term durability. The reviewers do, however, wonder if two volumes, or perhaps even one somewhat large volume, might not have been better than three rather thin volumes, especially when one considers the € 389.85 total price of the three volumes. It seems these very useful volumes will mostly be found in wealthy libraries.

Gary J. Long
Fernande Grandjean

BPS285 - THE SCIENCE AND APPLICATIONS OF ACOUSTICS. 2ND ED.

D. R. Raichel.

Springer, New York, 2006 - 660 pp.

ISBN 0-387-26062-5. Hbk. € 74,95.

This book provides a complete course book on a graduate level, covering many -if not all- important aspects of acoustics. It is of a quite mathematical nature with few illustrations (especially the first part of the book), which makes it somewhat 'dry' reading. Luckily, numerous worked examples and end-of-chapter problems are provided; these are really necessary to give the student the possibility to connect the math with the real world. Numerous references are given after each chapter; in many instances, the author comments on the virtues of the references, which is very useful. It's a pity that SI-units are not consistently used in the whole text and in all figures. Distances are sometimes given in meters, sometimes in feet, sometimes even in kiloyards!

After a first and very nice chapter on the history of acoustics (including a veritable 'who is who' of acoustics researchers over time), chapters 2 and 3 treat the fundamentals of acoustics, with all basic concepts and basics of sound propagation, reflection and refraction. These first few chapters could be used 'stand alone' if acoustics has to be treated in only a few lessons.

Chapters 4 to 6 treat the types of sound waves, obtained from vibrating strings, bars and plates. This very thorough treatment obviously requires some mathematics; additional information on Bessel functions and Laplace transforms is provided in appendices.

In chapters 7 and 8, transmission in ducts, waveguides and resonators is described. Chapters 9 and 10 conclude this first part of the book with sound detection: microphones, dB-meters and a very nice and thorough description of human hearing.

Chapters 11 to 14, forming a considerable number of pages, treat the acoustics of halls, the effects of sound barriers and the control of noise. The level of treatment is very high in these chapters making it really useful for someone faced with problems of noise control.

Some more advanced applications are given in chapters 15 (underwater acoustics), 16 and 17 (ultrasonics), 20 (vibration and vibration control) and 21 (nonlinear acoustics).

Strangely enough, music and musical instruments (chapter 18) and reproduction systems (chapter 19) are only treated in this very last part of the book. While the different kinds of musical instruments are described in great detail, the information provided on reproduction is quite limited and fragmentary. For example, loudspeaker systems – forming the heart of any sound reproduction system – are treated in merely 3 pages of text and one figure. Clearly, concepts such as speaker radiation patterns (beaming, diffraction), speaker efficiency and frequency response, speaker arrays and the use of horns could be introduced here.

While probably any book on acoustics, including this one, omits or neglects certain concepts (I found the paragraph on the Doppler effect quite incomplete; moving observers are not treated and no mention is made of sonic booms), the present book still contains a wealth of information on a very high level, and I would recommend it to anyone seriously interested in acoustics.

Dirk Poelman
