



BOOK REVIEWS

ACOUSTICAL IMAGING Vol. 25 , 2001, by M. Hallwell and P. N. T. Wells (editors). New York: Kluwer Academic/Plenum Publishers, xiv + 565pp. Price £121.00, €184.00, US\$175.00 ISBN 0-306-46516-7

This book is the proceedings of the 25th International Symposium on Acoustical Imaging, which was held on March 19–22, 2000 in Bristol, UK. It starts with three keynote papers. “Turning points in diagnostic ultrasound” by T. L. Szahó, “Ultrasound tissue characterization” by J. M. Thijssen, and “Design-directed research” by G. B. Devey. Seventy-seven papers, including the keynote papers, are then categorized into 11 sections. These are “Mathematics and Physics of Acoustical imaging”, “Transducers and Arrays”, “Non-destructive Evaluation”, “Geophysical and Underwater Ultrasounds”, “Microscopy and Microscanning”, “Scattering by Blood and Tissues”, “Medical and Biological Image Formation”, “Tissue Characterization”, “Tissue Motion and Blood Flow”, “Elasticity Imaging, Hard Tissues”, and “Novel and Emerging Methods”. An author index and subject index are also provided at the end; therefore, one can find what he/she wants by using these indices.

The first section, “Mathematics and Physics of Acoustical Imaging”, contains 11 papers, which deal with what is related to scattering, diffraction, tomography, array signal processing methods, focusing problems, etc. The next section introduces various transducers and arrays and their related signal processing schemes. Multilayer piezoelectric transducers, optimization of wideband beam patterns, piezoelectric ceramic polarization, the parametric sound field generated by a focused array, imaging with 2D transducers, phased arrays, and those for having to deal with laser-generated ultrasound, composite ultrasound for medical applications are some of the issues that are discussed in this section. The “Non-destructive Evaluation” section is composed of a relatively small number of papers. Time-dominant modelling of non-destructive ultrasonic fields, acoustical microscopy for plastic encapsulated devices, ultrasonic NDE utilizing instantaneous phase information, resonant photoacoustic detection and imaging methods, acoustography application to monitor impact damages are covered. In “Geophysical and Underwater Ultrasounds,” five papers address different issues but obviously share the same physics and signal processing issues. Imaging by multi-look synthesis, shallow water bubble cloud imaging, visualizing sound reflection from a planar rock wall, enhancement of multi-beam echo-sounder, and a satellite system for acoustic imaging can be found. The next section mainly deals with what is related to microscopy and micro scanning. Five papers are presented. Then the book moves to mainly on what is related to medical applications. The tissue-related subject is the main area of discussion. Nine papers on “Tissue Characterization”, seven papers on “Tissue Motion and Blood Flow”, six papers are categorized under “Elastic Imaging” which are mainly on the imaging methods for tissue. The “Hard Tissue” section has three papers. It turns out that there are 25 articles on what is directly related with tissue issues. The tissue subject is obviously one of the highlights of this book. Ultrasound tissue characterization, the Maxwell model that can describe a soft tissue, collagen characterization, carotid plaque characterization, skeletal status assessment method, lipid concentration determination by using wideband

ultrasound, thermal injury evaluation by non-contact ultrasonic imaging are some of the papers in the section "Tissue Characterization". The section "Tissue Motion and Blood Flow" starts with a wavelet transformation application to characterize tissue and flow imaging, a heart wall vibration mode study, a method for real-time blood flow velocity vector imaging, three papers on what is related to Doppler images are covered. The section "Elastic Imaging" mostly concentrates on the imaging of elastic characteristics of tissues. Tissue elastic modulus distribution imaging, incompressible biological soft tissue's elasticity imaging, a method of reconstructing Young's modulus from freehand elastograms, elastic contrast detection, 2D transient elastography, and intravascular palpography are what appears. The section "Hard Tissue" introduces a study on mineralized tooth tissue, None imaging, and finally, the human femur ultrasonic tomography.

It is noteworthy that "Scattering by Blood and Tissue" introduces a modelling which can be applied for the characterization of red blood cell aggregation, frequency-dependent characteristics of backscattered signals by aggregating red blood cells, and 20 MHz backscattering measurements. The section "Medical and Biological Image Formation" has five interesting papers. These include what is related to acoustical holography for breast imaging, an imaging technique that might have an application to skin tumor diagnosis, and soliton imaging methods. The last section, "Novel and Emerging Methods" contains five papers addressing what is obviously likely to be the methods that will have some impact on acoustic imaging.

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ENCYCLOPEDIA OF VIBRATIONS, 2002, by S. G. Braun (editor-in-chief). D. J. Ewins and S. S. Rao (editors). London: Academic Press, 1595 pp. price £620, \$925 (three volumes, hardbound). ISBN 0-12-227085-1

With its three volumes and 1660 pages, the editors of the *Encyclopedia of Vibrations* have produced a substantial and important reference work for practicing engineers and researchers. With its numerous contributors, the *Encyclopedia* provides comprehensive coverage of topics concerning mechanical vibrations. The stated aim of the *Encyclopedia* is to "focus on aspects of interest to practicing and research engineers", and these aspects cover a broad spectrum of traditional, modern and interdisciplinary topics. In achieving this aim, the *Encyclopedia* goes further than previous references works.

The general scope of the *Encyclopedia* concerns mechanical vibrations interpreted in a wide sense. It covers aspects of more traditional vibration analysis, application and engineering. However, emphasis is also placed on more modern, interdisciplinary topics, such as active control, smart structures and signal processing, and on the use of computers for vibration modelling, identification and control. These topics are at the forefront of current research and developments in the field and have become important because of the enormous impact of computer-related technologies in recent decades. With this enlarged scope, the *Encyclopedia* offers a modern reference work for the vibrations engineer or for those with interests in the field.

Encyclopedias come in a variety of styles, depending on the form and length of the entries. Here, there are 180 or so articles, arranged alphabetically, the length of an article typically being 5–15 pages. This style seems very sensible, the length of a typical article allowing the topic to be developed in some depth, as is necessary. The reader is encouraged to navigate the *Encyclopedia* by use of internal cross-referencing, as well as the contents