

REFERENCES

- Abbott, J.G., Rational and Derivation of MI and TI – A Review, *Ultrasound in Med. & Biol.*, 25(3), 431-441, 1999.
- AIUM/NEMA, *Standard for the Real-Time Display of Thermal and Mechanical Acoustic Output Indices on Diagnostic Ultrasound Equipment, Rev 1*, American Institute of Ultrasound in Medicine, Laurel, MD, and National Electrical Manufacturers Association, Rosslyn, VA, 1998.
- AIUM, *Bioeffects and Safety of Diagnostic Ultrasound*, American Institute of Ultrasound in Medicine, Laurel, MD, 1993.
- Akita, M., and Ueda M., The effects of windowing on spectral estimation of echoes scattered by a random medium, *J. Acoust. Soc. Am.*, 83(4), 1243-1248, 1988.
- Bacon, D. R., and Carstensen, E. L., Increased heating by diagnostic ultrasound due to nonlinear propagation, *J. Acoust. Soc. Am.*, 88(1), 26-34, 1990.
- Barber, F. E., The scanning acoustic microprobe: I. Analysis and synthesis of a spherically symmetric point spread function, *J. Acoust. Soc. Am.*, 90(1), 1-10, 1991.
- Barnett, S. B., Intracranial temperature elevation from diagnostic ultrasound, *Ultrasound in Med. & Biol.*, 27(7), 883-888, 2001.
- Carlson, B. M., *Human Embryology and Developmental Biology*, Mosby Year Book Inc., St. Louis, MS, 1994.
- Cavicchi, T. J., and O'Brien, W. D., Heat generated by ultrasound in an absorbing medium, *J. Acoust. Soc. Am.*, 76(4), 1244-1245, 1984.
- Cengel, Y. A., and Boles, M. A., *Thermodynamics: An Engineering Approach*, 2ed., McGraw-Hill, Inc., New York, 1994.
- Chaturvedi, P., and Insana, M. F., Error bounds on ultrasonic scatterer size estimates, *J. Acoust. Soc. Am.*, 100(1), 392-399, 1996.
- Chen, J. F., Zagzebski, J. A., and Madsen, E. L., Tests of backscatter coefficient measurement using broadband pulses, *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, 40(5), 603-607, 1993.
- Chew, W. C., *Waves and Fields in Inhomogeneous Media*, IEEE Press, New York, 1995.
- Fry, W. J., and Fry, R. B., Determination of absolute sound levels and acoustic absorption coefficients by thermocouple probes – theory, *J. Acoust. Soc. Am.*, 26(3), 294-310, 1954a.

- Fry, W. J., and Fry, R. B., Determination of absolute sound levels and acoustic absorption coefficients by thermocouple probes – experiment, *J. Acoust. Soc. Am.*, 26(3), 311-317, 1954b.
- Fujii, M., et al., Study of the cause of the temperature rise at the muscle-bone interface during ultrasound hyperthermia, *IEEE Trans. Biomed. Eng.*, 46(5), 494-504, 1999.
- Gerig, A., Zagzebski, J., and Varghese, T., Statistics of ultrasonic scatterer size estimation with a reference phantom, *J. Acoust. Soc. Am.*, 113(6), 3430-3437, 2003.
- Gore, J. C., and Leeman, S., Ultrasonic backscattering from human tissue: A realistic model, *Phys. Med. Biol.*, 22(2), 317-326, 1977.
- Goss, S. A., Johnston, R. L., and Dunn, F., Compilation of empirical ultrasonic properties of mammalian tissues, *J. Acoust. Soc. Am.*, 64(2), 423-457, 1978.
- Goss, S. A., Frizzell, L. A., and Dunn, F., Ultrasonic absorption and attenuation in mammalian tissues, *Ultrasound in Med. & Biol.*, 5, 181-186, 1979.
- Goss, S. A., Johnston, R. L., and Dunn, F., Compilation of empirical ultrasonic properties of mammalian tissues. II, *J. Acoust. Soc. Am.*, 68(1), 93-108, 1980.
- Goueygou, M., Harris, J. G., and O'Brien, W. D., Time-domain solution of the temperature increase induced by diagnostic ultrasound, *IEEE Ultrasonics Symposium*, 1385-1388, 1999.
- Gray, H., *Gray's Anatomy: Anatomy, Descriptive and Surgical*, Courage Books, Philadelphia, PA, 1974.
- Haken, B. A., Frizzell, L. A., and Carstensen, E. L., Effect of mode conversion on ultrasonic heating at tissue interfaces, *J. Ultrasound Med.*, 11, 393-405, 1992.
- He, P., and Greenleaf, J. F., Application of stochastic analysis to ultrasonic echoes – estimation of attenuation and tissue heterogeneity from peaks of echo envelope, *J. Acoust. Soc. Am.*, 79(2), 526-534, 1986.
- Hearn, D., and Baker, M. P., *Computer Graphics: C Version, 2nd ed.*, Prentice Hall, Upper Saddle River, New Jersey, 1997.
- Horder, M. M., et al., *In vivo* heating for the guinea-pig fetal brain by pulsed ultrasound and estimates of thermal index, *Ultrasound in Med. & Biol.*, 24(9), 1467-1474, 1998.
- Insana, M. F., Madsen, E. L., Hall, T. J., and Zagzebski, J. A., Tests of the accuracy of a data reduction method for determination of acoustic backscatter coefficients, *J. Acoust. Soc. Am.*, 79(5), 1230-1236, 1986.
- Insana, M. F., et al., Describing small-scale structure in random media using pulse-echo ultrasound, *J. Acoust. Soc. Am.*, 87(1), 179-192, 1990.

- Insana, M. F., and Hall, T. J., Parametric ultrasound imaging from backscatter coefficient measurements: Image formation and interpretation, *Ultrason. Imaging*, 12, 245-267, 1990.
- Jongen, H. A. H., et al., A general model for the absorption of ultrasound by biological tissues and experimental verification, *J. Acoust. Soc. Am.*, 79(2), 535-540, 1986.
- Kakac, S., and Yener, Y., *Heat Conduction*, 2ed., Hemisphere Publishing Corporation, Washington, 1985.
- Kay, S. M. and Marple, S. L., Spectrum analysis – a modern perspective, *Proceedings of the IEEE*, 69(11), 1380-1419, 1981.
- Kino, G. S., *Acoustic Waves: Devices, Imaging, and Analog Signal Processing*, Prentice-Hall, Englewood Cliffs, NJ, 1987.
- Kudo, N., et al., Basic study on the ultrasound attenuation of fibrous biological tissue in the frequency range of 10-40 MHz, *IEEE Ultrasonics Symposium*, 1479-1482, 1998.
- Lizzi, F. L., et al., Theoretical framework for spectrum analysis in ultrasonic tissue characterization, *J. Acoust. Soc. Am.*, 73(4), 1366-1373, 1983.
- Lizzi, F. L., et al., Computer model of ultrasonic hyperthermia and ablation for ocular tumors using B-mode data, *Ultrasound in Med. & Biol.*, 18(1), 59-73, 1992.
- Lizzi, F. L., et al., Ultrasonic spectrum analysis for tissue assays and therapy evaluation, *Int. J. Imaging Syst. Technol.*, 8, 3-10, 1997a.
- Lizzi, et al., Statistics of ultrasonic spectral parameters for prostate and liver examinations, *IEEE Trans. Ultrason. Ferroelect. Freq. Contr.*, 44(4), 935-942, 1997b.
- Lubbers, J., Hekkenberg, R. T., Bezemer, R. A., Time to threshold (TT), a safety parameter for heating by diagnostic ultrasound, *Ultrasound in Med. & Biol.*, 29(5), 755-764, 2003.
- Lyons, M. E., and Parker, K. J., Absorption and attenuation in soft tissues II – experimental results, *IEEE Trans. Ultrason. Ferroelect. Freq. Contr.*, 35(4), 511-521, 1988.
- Madsen, E. L., Insana, M. F., and Zagzebski, J. A., Method of data reduction for accurate determination of acoustic backscatter coefficients, *J. Acoust. Soc. Am.*, 76(3), 913-923, 1984.
- Madsen, E. L., et al., Interlaboratory comparison of ultrasonic backscatter, attenuation, and speed measurements, *J. Ultrasound Med.*, 18, 615-631, 1999.
- Mayer, W. G., Mode conversion of ultrasonic waves at flat boundaries, *IEEE Trans. Sonics. Ultrason.*, SU-11(1), 1-3, 1964.

- MEDLINEplus Merriam-Webster Medical Dictionary*, National Library of Medicine, 2003.
- Morse, P. M., and Ingard, K. U., *Theoretical Acoustics*, McGraw-Hill, Inc., New York, 1968.
- Nassiri, D. K., and Hill, C. R., The use of angular acoustic scattering measurements to estimate structural parameters of human and animal tissues, *J. Acoust. Soc. Am.*, 79(6), 2048-2054, 1986.
- Narayana P. A., and Ophir J., A closed form method for the measurement of attenuation in nonlinearly dispersive media, *Ultrasonic Imaging*, 5, 17-21, 1983.
- NCRP, *Exposure Criteria for Medical Diagnostic Ultrasound: I. Criteria Based on Thermal Mechanisms*, NCRP Report No. 113, National Council on Radiation Protection and Measurements, Bethesda, MD, 1992.
- Nightingale, K. L., Nightingale, R. W., Palmer, M. L., and Trahey, G. E., A Finite Element model of remote palpation of breast lesions using radiation force: Factors affecting tissue displacement, *Ultrasonic Imaging*, 22, 35-54, 2000.
- Nishimura, H., et al., *Prenatal Development of the Human with Special Reference to Craniofacial Structures: An Atlas*, US Dept. of Health, Education, and Welfare, Bethesda, ML, 1977.
- Nyborg, W. L., Heat generation by ultrasound in a relaxing medium, *J. Acoust. Soc. Am.*, 70(2), 310-312, 1981.
- O'Brien, W. D., *Ultrasonic Techniques*, Class Notes for ECE374, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, 2000.
- O'Donnell, M., and Miller, J. G., Quantitative broadband ultrasonic backscatter: An approach to nondestructive evaluation in acoustically inhomogeneous materials, *J. Appl. Phys.*, 52(2), 1056-1064, 1981.
- Oelze, M. L., and O'Brien, W. D., Jr., Frequency-dependent attenuation-compensation functions for ultrasonic signals backscattered from random media, *J. Acoust. Soc. Am.*, 111(5), 2308-2319, 2002a.
- Oelze, M. L., and O'Brien, W. D., Jr., Method of improved scatterer size estimation and application to parametric imaging using ultrasound, *J. Acoust. Soc. Am.*, 112(6), 3053-3063, 2002b.
- Oelze, M. L., Zachary, J. F., and O'Brien, W. D., Characterization of tissue microstructure using ultrasonic backscatter: theory and technique optimization using a Gaussian form factor, *J. Acoust. Soc. Am.*, 112(3), 1202-1211, 2002.
- Ohtuski, F., Developmental changes of the cranial bone thickness in the human fetal period, *Am. J. Phys. Anthrop.*, 46, 141-154, 1977.

- Parker, K. J., The thermal pulse decay technique for measuring ultrasonic absorption coefficients, *J. Acoust. Soc. Am.*, 74(5), 1356-1361, 1983.
- Parker, K. J., Effects of heat conduction and sample size on ultrasonic absorption measurements, *J. Acoust. Soc. Am.*, 77(2), 719-725, 1985.
- Paulsen, K. D., Hoopes, J. P., and Ryan, T. P., Is penile electrocautery safe? Part II: Temperature assessment in a pediatric computational model, *Thermal Treatment of Tissue: Energy Delivery and Assessment, Proc. of SPIE*, 4247, 194-202, 2001.
- Peebles, P. Z., *Probability, Random Variables, and Random Signal Principles*, 3rd ed., McGraw-Hill, Inc., New York, 1993.
- Pennes, H. H., Analysis of tissue and arterial blood temperatures in the resting human forearm, *J. of Appl. Physiol.*, 1(2), 93-122, 1948.
- Pierce, A. D., *Acoustics: An Introduction to Its Physical Principles and Applications*, Acoustical Society of America, Woodbury, New York, 1991.
- Proakis, J. G., and Manolakis, D. G., *Digital Signal Processing: Principles, Algorithms, and Applications*, 3rd ed., Prentice Hall, Upper Saddle River, New Jersey, 1996.
- Raum, K., and O'Brien, W. D., Pulse-echo field distribution measurement technique for high-frequency ultrasound sources, *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, 44(4), 810-815, 1997.
- Routh, H. F., Doppler ultrasound: The ability to measure and image blood flow, *IEEE Eng. Med. Biol.*, November/December, 31-40, 1996.
- Siddiqi, T. A., Miodovnik, M., Meyer, R. A., and O'Brien, W. D., Jr., In vivo ultrasonographic exosimetry: Human tissue-specific attenuation coefficients in the gynecologic examination, *Am. J. Obstet Gynecol.*, April, 866-874, 1999.
- Sidney, D. A., Three-dimensional ultrasound power deposition modeling, thermal field visualization, and clinical integration for hyperthermia therapy, PhD dissertation, Massachusetts Institute of Technology, 1997.
- Simpson, D. H., Burns, P. N., and Averkiou, M. A., Techniques for perfusion imaging with microbubble contrast agents, *IEEE Trans. Ultrason. Ferroelect. Freq. Contr.*, 48(6), 1483-1494, 2001.
- Wear, K. A., et al., Differentiation between acutely ischemic myocardium and zones of completed infarction in dogs on the basis of frequency-dependent backscatter, *J. Acoust. Soc. Am.*, 85(6), 2634-2641, 1989.

Wear, K. A., Ultrasonic attenuation in human calcaneus from 0.2 to 1.7 MHz, *IEEE Trans. Ultrason. Ferroelect. Freq. Contr.*, 48(2), 602-608, 2001a.

Wear, K. A., Fundamental precision limitations for measurements of frequency dependence of backscatter: Applications in tissue mimicking phantoms and trabecular bone, *J. Acoust. Soc. Am.*, 110(6), 3275-3282, 2001b.

Wear, K. A., A Gaussian framework for modeling effects of frequency-dependent attenuation, frequency-dependent scattering, and gating, *IEEE Trans. Ultrason. Ferroelectr. Freq. Control*, 49(11), 1572-1582, 2002.

Wilkening, W., et al., Brain perfusion imaging using contrast agent specific imaging modes, *IEEE Ultrason. Symp.*, 1721-1724, 1999.

Wilkening, W., et al., Ultrasonic assessment of perfusion conditions in the brain and in the liver, *IEEE Ultrason. Symp.*, 1545-1548, 2000.

Wojcik, J., Filipczynski, L., and Kujawska, T., Temperature elevations computed for three-layer and four-layer obstetrical tissue models in nonlinear and linear ultrasonic propagation cases, *Ultrasound in Med. & Biol.*, 25(2), 259-267, 1999.