

2.7 31627 ACOUSTICAL MODELING AND AURALIZATION

1. Introduction
2. Acoustical Modeling
 - 2.1 Physical Models
 - 2.2 Frequency and Wavelength Considerations in Physical Models
 - 2.3 Time and Distance Considerations in Physical Models
 - 2.4 Medium Considerations in Physical Models.
 - 2.5 Source and Receiver Considerations in Physical Models
 - 2.6 Surface Materials and Absorption Considerations in Physical Models
3. Computational Models
 - 3.1 Geometrical Models
 - 3.2 Wave Equation Models
 - 3.3 Analytical Model: Full-Wave Methodology
 - 3.4 Numerical Model: Boundary Element Methodology
 - 3.5 Statistical Models
 - 3.6 Small Room Models
4. Empirical Models
 - 4.1 Gypsum Cavity Wall Absorption
 - 4.2 Absorption from Trees and Shrubs
 - 4.3 Hybrid Models
5. Auralization
 - 5.1 The Basic Auralization Process
 - 5.2 Implementation
 - 5.3 Binaural Reproduction Using Loudspeakers
 - 5.4 Binaural Reproduction Using Headphones
 - 5.5 Multichannel Reproduction Using Loudspeaker
 - 5.6 Real-Time Auralization and Virtual Reality

References Books:

1. Makrinenko, Leonid I. "Acoustics of Auditoriums in Public Buildings." First Publication: 1986 (Russian).
2. Pierce, Allan D. Acoustics. "An Introduction to Its Physical Principles and Applications." Acoustical Society of America, 1991, 2nd printing.
3. Allen, J. B. and Berkley, D. A. "Image Method for Efficiently Simulating Small-Room Acoustics." Journal of the Acoustical Society of America.
4. Barish, J. "Extension of the Image Method to Arbitrary Polyhedra." Journal of the Acoustical Society of America.