Session 3aAOb

Acoustical Oceanography: Acoustical Oceanography Prize Lecture

Peter F. Worcester, Chair
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Chair's Introduction—9:30

Invited Paper

9:45

3aAOb1. Surf zone bubble spectrometry: The role of the acoustic cross section. Timothy Leighton (Inst. of Sound and Vib. Res., Univ. of Southampton, Highfield, Southampton SO17 1BJ, UK)

Fifty years ago, there were doubts as to whether microbubbles existed in the sea at all. Herman Medwin settled the issue in the 1960s by showing that they were indeed present, and in very large numbers. He interpreted *in situ* measurements of backscatter and attenuation using the concept of the acoustic cross section. In essence that procedure forms the basis of the most popular ways of measuring microbubbles today, the two favored experimental layouts (measurement of attenuation and sound speed along a propagation path, and the acoustical resonator) being based on techniques pioneered by Medwin. In recent years attempts have been made to take these open ocean techniques and deploy them in the surf zone. Here the assumptions inherent in the standard form of the cross section can be violated. Specifically, the conditions may not relate to plane wave insonification of isolated bubbles undergoing steady state single-frequency linear pulsations in the free field in an incompressible liquid. This paper describes the attempts that have been made to produce cross sections which are not restricted by these limitations, and how these are exploited in determining the evolution, anatomy, and effects of bubble clouds. [The support of The Royal Society Leverhulme Trust is acknowledged.]

Session 3aEA

Engineering Acoustics, Physical Acoustics, Noise, Underwater Acoustics and Structural Acoustics and Vibration: Celebration of Miguel C. Junger's Contributions to Acoustics

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David Feit, Cochair
Carderock Division, Naval Surface Warfare Center, 9500 MacArthur Boulevard, West Bethesda, Maryland 20817

Chair's Introduction—8:45

Invited Papers

8:50

3aEA1. Vibration damping layer performance enhancement with an intermittent bond. J. Garrelick (Cambridge Acoust. Assoc., Anteon Corp., 84 Sherman St., Cambridge, MA 02140, jgarrelick@anteon.com)

Having arrived in the U.S. in 1941 and upon graduating from the MIT in 1944, Miguel C. Junger's early contributions to structural-acoustics were predominantly structural. With war needs dominating, Miguel worked on aircraft engine testing at Wright Aeronautical Corp. and subsequently Naval ship shock mounts at Barry Controls. The clichéd ''can do'' attitude of these early war years may or may not have been the genesis of his much admired approach to technical problems of all stripes, a focus on fundamental physical principles and the utilization of rigor to extract the essence. In this talk, by example, I will attempt to illustrate how ''Miguel's acoustics'' has influenced and benefited his colleagues. The example is a problem recently confronted by the author, the effect of an intermittent bond on damping layer performance. Damping treatments are typically uniformly bonded, with any irregularity in converage deemed shoddy. However, this need not be the case and an intermittent bond may actually enhance performance. This will be demonstrated for an unconstrained layer with the intermittency represented by periodic gaps. Numerical results are compared for two solution approaches, one a somewhat plodding viscoelastic layer analysis, the other a rather highly idealized asymptotic representation, to capture the essence.