marginal increases in TTS with increasing noise intensity. However, increasing noise duration with constant noise exposure levels yielded greater shifts.

4:10

2pABb7. A comparison of behavioral and auditory brainstem response methods for examining hearing sensitivities in the harbor seal (*Phoca vitulina*). Lawrence F. Wolski, Rindy C. Anderson, and Ann E. Bowles (Hubbs-SeaWorld Res. Inst., 2595 Ingraham St., San Diego, CA 92109)

Auditory brainstem response (ABR) and behavioral methods (method of constant limits and staircase method) were used to generate in-air audiograms for an adult female harbor seal to examine relative sensitivities obtained using the two methods. Behavioral thresholds ranged from 0.250–30 kHz and indicated best sensitivity from 6–12 kHz (~12 dB *re*: 20 μPa). The staircase method was more sensitive than the method of constant limits, resulting in thresholds averaging 10 dB lower. ABR thresholds were recorded at 2, 4, 8, 16, and 22 kHz and showed a similar range of best sensitivity (8–16 kHz). ABR and behavioral thresholds differed by an average of 5 dB; ABR thresholds averaged 3.8 dB higher than behavioral thresholds from 2–8 kHz, but were 12 and 3 dB lower at 16 and 22 kHz, respectively. The lower ABR thresholds at higher frequencies may reflect the behavior of the seal during ABR testing as well as broadband characteristics of ABR test stimuli. These results agree with comparisons of ABR and behavioral methods performed in other recent studies and indicate that auditory evoked potential methods represent an accurate alternative to behavioral methods for estimating hearing range and sensitivity in wild animals. [Work supported by NASA: NAS1-20101.]

4:25–5:10

Panel Discussion

TUESDAY AFTERNOON, 5 DECEMBER 2000 PACIFIC SALON D, 1:00 TO 5:50 P.M.

Session 2pBB

Biomedical Ultrasound/Bioresponse to Vibration, Physical Acoustics and Acoustical Oceanography: Detection and Characterization of Bubbles, Acoustic Cavitation, and Associated Physical Effects II

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Chair's Introduction—1:00

Invited Papers

1:05

2pBB1. Characterization of measures of reference acoustic cavitation (COMORAC). Timothy G. Leighton (Inst. of Sound and Vib. Res., Univ. of Southampton, Highfield, Southampton SO17 1BJ, UK)

This paper describes a coordinated experiment involving a number of UK centers, with the aim of comparing a range of systems which measure cavitational activity. Sensors have been designed at a number of universities to produce quantitative outputs based on sonochemical (Bath and Southampton), calorimetric (Coventry), electrochemical and luminescent (Southampton) measures. In addition, acoustic sensors have been produced (Guys and St. Thomas Hospital Trust, and the National Physical Laboratory). These are all deployed to monitor controlled cavitation events, ranging from single bubble phenomena to a reference cavitation bath (produced by NPL). Design of these cavitation systems has involved not only the characterization of the sound field and the vessel, but also the specification of some reference cavitation liquid (NPL and Southampton). Comparison of the resulting measures of activity allows the feasibility of a scale for cavitation to be investigated.

1:30

2pBB2. Optical Mie scattering to observe single cavitation bubble dynamics. R. Glynn Holt (Dept. of Aerosp. and Mech. Eng., Boston Univ., 110 Cummington St., Boston, MA 02215, rgholt@bu.edu)

It is often advantageous to know precisely the instantaneous response of bubbles to an external acoustic field. One technique to enable such observations consists of detecting the time-resolved optical scattering of an incident laser beam from a bubble. For visible laser light and bubble radii on the order of 1–100 microns, reflection, refraction, internal interference, and diffraction must all be taken into account, and the scattering so described is named after Gustav Mie. Physical principles and the mathematical development will be discussed. Several specific applications will be presented and the results discussed. Finally, a brief list of ''do's and don'ts'' for the potential user will be discussed.