Contributed Paper

10:25

2aAAb4. Individual subjective preference of listeners for vocal music sources in relation to the subsequent reverberation time of sound fields. Hiroyuki Sakai (Grad. School of Sci. and Technol., Kobe Univ., Rokkodai, Nada, Kobe, 657 Japan), Hiroshi Setoguchi (Miyama Conceru, Kagoshima, 899-66 Japan), and Yoichi Ando (Kobe Univ., Kobe, 657 Japan)

The purpose of this study is to evaluate subjective preference of a simulated sound field by listeners in changing subsequent reverberation time T_{sub} using vocal music sources. Previously, a great deal of effort has been made on the study using music or speech [for example, Ando *et al.*, Acustica **50**, 134–141 (1982); J. Acoust. Soc. Jpn. **39**, 89–95 (1983)]. In addition to subjective preference judgments, the α-waves' range of the continuous brain waves (CBW) in relation to the specialization of human cerebral hemispheres is also evaluated [C. Chen and Y. Ando, J. Archit. Plann. Environ. Eng., AIJ **489**, 73–80 (1996)]. In this paper, subjective evaluation using vocal music sources, which is often played in concert halls and opera houses, has been examined. Subjective preference tests were conducted changing T_{sub}, which is one of the four objective parameters in relation to subjective preference of sound fields. Individual differences of subjective preference as well as global preference are discussed. [Work was partially supported by the Ministry of Education, Grant-in-Aid for Scientific Research (C), 9838022, 1997.]

TUESDAY MORNING, 23 JUNE 1998 VASHON ROOM (W), 8:00 TO 10:45 A.M.

Session 2aAB

Animal Bioacoustics: Insect, Insectivore and Avian Acoustics

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Invited Papers

8:00

2aAB1. Scale effects as constraints in insect sound communication. Henry Bennet-Clark (Dept. of Zoology, Oxford Univ., S. Parks Rd., Oxford OX1 3PS, UK)

Calling insects have problems of optimizing range and maintaining the specificity of the call. Higher frequencies are more easily refracted and reflected by objects in the environment. Smaller insects have less muscle power and also, because of the small sound source size, higher frequencies are radiated more efficiently than lower frequencies. In open air or water, the sound spreads spherically and decays by the inverse square law. If the sound can be confined to a sheet it decays as the inverse of range while within a rod it decays due to viscous losses; such calls are usually rather simple pulses and rely on initial time of arrival because of multiple pathlengths in the environment. With airborne sounds, those in the range from 1 to 10 kHz tend to have sustained pure-tone components and a specific pattern of pulses which propagates well; but with higher frequencies pulses tend to become briefer and, once again, to rely on time of arrival of the onset.

8:25

2aAB2. Acoustic detection and identification of insects in soil. Richard Mankin (USDA-Agric. Res. Service, Ctr. for Medical, Agricultural, and Veterinary Entomology, P.O. Box 14565, Gainesville, FL 32604)

There is considerable practical need for user-friendly, inexpensive devices that detect and quantify insect populations in environments hidden from visual observation. One approach that has been used with varying success has been to detect the insects through the sounds or vibrations they generate for communication or through noises that are produced incidentally during feeding and general movement. The ability to precisely monitor soil insect populations is limited by interference from background noise and the high rate of attenuation of sound in soil. This paper describes experiments using different sensors and analysis techniques for detection of insects in soil in an agricultural environment. Results from different sensors are compared, and the spectral and temporal patterns that can be used to distinguish the target insects from noise and nontarget soil organisms are discussed. The use of accelerometers attached to 20–30-cm nails appears to be a low-cost, user-friendly method to locate and monitor the size of infestations of soil insects that tend to group together in clumps.

Contributed Papers

8:50

2aAB3. Two-tone suppression of the ultrasound induced startle response in a cricket. Hamilton E. Farris and Ronald R. Hoy (Sec. Neurobiology and Behavior, Mudd Hall, Cornell Univ., Ithaca, NY 14850, hef1@cornell.edu)

For the ground cricket, *Eunemobius carolinus*, frequencies >20 kHz elicit an acoustic startle response during flight. No startle responses are elicited by single pulses of low-frequency stimuli. However, simultaneous presentation of a low-frequency signal with ultrasound can suppress the startle response. The effect of frequency on suppression was measured for seven frequencies (3–9 kHz) at four intensities of the startle stimulus (40 kHz): 5, 8, 10, and 12 dB above startle threshold. Suppression was tuned to frequencies near 5 kHz. This effect of frequency on suppression diminished slightly at the higher ultrasound intensities, however. Because suppressor growth (change in suppression dB versus change in 40-kHz dB) was >1 for 5–7 kHz and >1 for 3 to 4, 8 to 9 kHz, equal suppression curves flattened at the highest ultrasound levels. Startle threshold de-