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CONTENTS

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ARTICLES

TECHNICAL NOTES

Sound absorption characteristics of a single microperforated panel absorber backed by a porous absorbent layer

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ABSTRACT: A microperforated panel (MPP) is usually used with an air-back cavity backed by a rigid wall to form a Helmholtz-type resonance absorber. In the case of a common perforated panel with larger perforations, a porous absorbent is usually located behind the panel to add acoustic resistance for efficient sound absorption. In the case of an MPP, if a porous layer is inserted in the cavity, the absorption may be deteriorated by the large acoustic resistance due to the porous absorbent. However, if the resistance is suitably adjusted, it is expected that a porous layer can widen the absorption frequency range by the additional damping by the porous absorbent. In this study, a single-leaf MPP absorber backed by a rigid-back wall with a porous absorbent layer in the cavity is analysed using an electro-acoustical equivalent circuit model and its absorption characteristics are discussed through the numerical examples.

Auditory room size perceived from a room acoustic simulation with autophonic stimuli

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ABSTRACT: By listening to the sound of their own voice in a room, a talking-listener receives useful information about the acoustical characteristics of the enclosed environment. The information they receive about a specific acoustical characteristic is generally supplemented by other sensory, especially visual, stimuli that can influence one?s perception of (and in) these environments. One such characteristic is the size of the room perceived through the human auditory apparatus, which can be different from the room?s physical size, as well as the visually perceived room size. This paper examines the relationship between judgements of the size of a room environment that is based on auditory stimuli, and relevant room acoustic parameters; where these judgements may contrast with the objective size as indicated by room acoustic theory. The room size judgements were collected from a study conducted in an auditory mixed-reality environment, in which a talking-listener can perceive the sound of his/her own voice in the simulated reverberant conditions of real rooms, while physically being in an anechoic room. In this study, human participants performed talking tasks, and rated the aurally perceived size of each room. The results indicate that the level of the acoustical support provided by the room?s environment (quantified here as room gain) accounts for more of the variance in the associated room size judgements than any other predictor.

The effect of seabed properties on the receive beam pattern of a hydrophone located on the seafloor

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ABSTRACT:?Multi-path interference is often considered when modelling propagation of underwater sounds from source to receiver. When close to, or on the seabed, a hydrophone receives the direct and bottom reflected signals at nearly identical times. The resulting interference leads to an effective receive beam pattern that depends not only on source and receiver position and water depth, but also on the seabed characteristics, which affect the phase and magnitude of the reflection coefficient. Numerical acoustic propagation models account for this phenomenon automatically, however; it is important that it be taken into account when received signals are used to carry out simple calculations of source levels of nearby sources based on spherical spreading. Australian waters lie above seabeds of greatly differing acoustic properties. Compressional and shear sound speeds and absorption properties for four bottom types (basalt, calcarenite, sand and silt) were used to model the effective receive beam pattern of a hydrophone located on the seafloor. Modelling was carried out for all four seabeds as well as a seabed comprising differing thicknesses of sand over a calcarenite half space. The effects of the resulting receive beam pattern on estimations of source levels and locations are discussed.

Road traffic controllers and the use of level dependent hearing protectors

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ABSTRACT: Constant, clear radio and voice communication is of crucial importance in safe working conditions for traffic controllers. The provision of electronic, level dependent, sound-restoration ear muffs would seem to offer an ideal solution to a working environment where the daily noise exposure is below the regulated level but frequently experiences periods of high continuous and impulsive noise. This report shows that careful thought and good consultation with the intended users must occur before these devices are introduced and accepted into the workplace.

Effective noise reports and presentations for planning panels

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Physclips: a multimedia, multi-level introduction to mechanics, waves and sound

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