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## **An on-demand simultaneous annoyance and indoor noise recording technique**

Con J. Doolan and Danielle J. Moreau

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Vol. 41, No. 2 pp 141 - 145 (2013)

ABSTRACT: A novel methodology is presented for the simultaneous measurement of noise and personal annoyance at the exact times

that the affected person is annoyed. The system is described and applied to a test case, a farmhouse close to a wind farm

where the resident claims to be annoyed by noise. The system was successfully able to characterise the level and spectral

content of the noise in the house when the resident was annoyed, and there was some correlation with personally recorded

annoyance level. As the system cannot identify noise sources, no conclusions can be made about noise source; however, the methodology is shown to be a useful aid for diagnosing the type and severity of an indoor noise problem. To help interpret the results from this type of testing, a discussion concerning the subjective nature of noise annoyance is presented before some suggestions are made for further improvements in the measurement system.

## **Assessment of an acoustic screen used for sound exposure management in a professional orchestra**

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Vol. 41, No. 2 pp 146 - 150 (2013)

**ABSTRACT:** It has been shown that orchestral musicians risk damage to their hearing from workplace noise exposure. Personal, administrative and engineered control measures strive to reduce exposure to the musicians while having minimal impact on the musicians' ability to produce music to the highest standard. Acoustic screens form part of a range of controls used to manage sound exposure, but their construction and placement needs to be carefully considered in the orchestral setting. Existing acoustic screens for use in orchestras have been shown to be ineffectual, to exacerbate risk of injury to some players through qualitative and quantitative changes to the acoustic environment or suffer other practical limitations such as obscuring sight lines. This study reports on an acoustic screen currently in use designed to protect musicians in front of high volume instruments while having minimal impact on players of these high volume instruments through the use of appropriately arranged diffusive and reflective materials. Sound level testing was carried out with the screens in various positions in the orchestra pit with both pink noise and high level instruments used as a sound source. Additionally sound levels were monitored during orchestral performances to assess the impact of the screens on actual exposure levels. Results indicate the screens effectively reduce exposure to those in front of high-level instruments while having a negligible impact

on those producing these high sound levels.

### **On absorption and scattering coefficient effects in modelling software**

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Vol. 41, No. 2 pp 151 - 155 (2013)

**ABSTRACT:** This paper presents the results provided by two simulation programs for a very simple model: a cube in which all sides have the same absorption but different global scattering coefficients. Effects on merit figures of the main acoustic parameters are shown for scattering changes for a single absorption coefficient. The results are helpful for understanding the role of absorption and scattering on the values of these parameters.

### **An experimental study on the sound absorption of three-dimensional MPP space sound absorbers: Rectangular MPP space sound absorber (RMSA)**

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Vol. 41, No. 2 pp 156 - 159 (2013)

**ABSTRACT:** A microperforated panel (MPP) is usually placed with a rigid-back wall to form a Helmholtz resonator with its hole and the air-back cavity. However, the authors have so far proposed an MPP space sound absorber without any backing structure. In the previous studies, as a basic form of such an MPP space absorber, multiple-leaf MPP structures without a back wall were proposed, and were theoretically and experimentally examined. In order to provide more unrestricted usage and designs for an MPP space absorber, the authors have also proposed a three-dimensional MPP space absorber, called a cylindrical MPP space absorber (CMSA). The CMSA was shown to exhibit resonance peak absorption and

additional low frequency absorption. In this paper, another alternative of a three-dimensional MPP space absorber, a rectangular MPP space absorber (RMSA) is proposed. Its sound absorption performance is discussed using experimentally measured results. The results show sound absorption characteristics similar to a CMSA, and an RMSA can be effectively used if properly designed.

## **The division of the perceptual vowel plane for different accents of English and the characteristic separation required to distinguish vowels**

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Vol. 41, No. 2 pp 160 - 164 (2013)

ABSTRACT: The results of an on-line study of vowel recognition by English speakers are analysed. A relatively unused region of the perceptual vowel plane is identified at about  $(F_2, F_1) = (1800 \text{ Hz}, 350 \text{ Hz})$ . The rest of the plane is divided among vowels in ways that differ somewhat for different countries and regions thereof. Vowel length is used in several cases to help distinguish vowels whose distributions overlap substantially in  $(F_2, F_1)$ . When the fundamental frequency is higher, the values of  $F_1$  and  $F_2$  are also higher, though much less than proportionally. This is consistent with the observation that women's vocal tracts are usually shorter than men's. The characteristic separations required to distinguish vowels in the  $(F_2, F_1)$  plane were 115 Hz and 292 Hz in the  $F_1$  and  $F_2$  directions respectively, with similar values in different countries.

## **Shock waves and the sound of a hand-clap ? A simple model**

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Vol. 41, No. 2 pp 165 - 168 (2013)

ABSTRACT: The aerodynamics of the impact between two human hands in a hand-clap is

examined, in particular in relation to the hand profile which may be either nearly complementary between the two hands, giving a nominally flat impact, or else domed so that there is a significant enclosed volume. It is shown that shock waves are generated in nearly all hand-claps, with the addition of a Helmholtz-type resonance in the case of domed impacts. As can be judged by simple listening, a flat clap produces broad-band sound that typically extends to about 10 kHz while the spectrum of a domed clap usually has a subsidiary maximum somewhere below 1 kHz and then declines with frequency more rapidly than does the flat clap.

### **Noise from other peoples' headsets**

Warwick Williams and Tom Harper  
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Vol. 41, No. 2 pp 169 - 170 (2013)

ABSTRACT: Noise leaking from under the headsets of personal stereo users is sometimes found annoying by those in the immediate vicinity and can be the subject of complaints. Measurements presented here demonstrate that the associated noise levels should be minimal in nature and not pose a significant source of difficulty for most people.

### **Acoustic redesign of Brisbane City Hall Auditorium**

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Vol. 41, No. 2 pp 171 - 173 (2013)

ABSTRACT: Prompted by a need for urgent structural repairs, a \$215 million project was initiated by Brisbane City Council in 2009 to restore Australia's largest town hall. AECOM was commissioned through the architects to provide acoustic advice for the overall building, including Council Chambers, staff offices, and a new rooftop gallery for the Museum of Brisbane. AECOM was also engaged to provide specialist architectural acoustic design for restoration of the main Auditorium.

### **Musical rhythm, vibrato and wind turbine noise**

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ABSTRACT: The nature and origin of frequency and amplitude modulation in music and other related human activities is examined and particular neural sensitivity is identified in the frequency range 1 to 10 Hz. It is surmised that amplitude modulation as the vanes pass the tower may be a major factor in wind turbine annoyance, and suggested that an electro-acoustic system to reduce this modulation might be effective in reducing noise annoyance.