

Institute of Acoustics

# 24th Reproduced Sound Conference 2008

Reproduced Sound 24: Immersive Audio

Proceedings of the Institute of Acoustics  
Volume 30, Part 6

November 20-21, 2008  
Brighton, UK

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)

**ISBN: 978-1-60560-681-1**

**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright (2008) by the Institute of Acoustics.  
All rights reserved.

For permission requests, please contact the Institute of Acoustics at the address below.

Institute of Acoustics  
Proceedings  
77A St Peter's Street  
St. Albans Hertfordshire  
AL1 3BN  
United Kingdom

# TABLE OF CONTENTS

<b>The Importance of the Direct to Reverberant Ratio in the Perception of Distance, Localization, Clarity, and Envelopment</b> .....	1
<i>D. Griesinger</i>	
<b>The Effect of Visual Stimuli on the Perception of 'Natural' Loudness and Equalisation</b> .....	14
<i>P.R. Newell, K.R. Holland, B. Neskov, S. Castro, M Desborough, S.T. Guijarro, A. Pena, E. Valdigem, D.S. Staub, J.P. Newell, L. Harris, C. Beusch</i>	
<b>The Effect of Diffusers on Low Frequency Modes</b> .....	26
<i>J.A.S. Angus</i>	
<b>Acoustic Geometry Sculptor – a Computer Program for Optimising Room Surfaces</b> .....	40
<i>M. Whitcroft</i>	
<b>Real World Line Array Optimisation</b> .....	50
<i>A. Thompson</i>	
<b>Microphone Techniques for Surround Sound: How Many Microphones and Where to Put Them?</b> .....	61
<i>D. Carugo</i>	
<b>Evaluating Loudspeaker Quality at Low Frequencies: Optimisation of a Music-focussed Modulation Transfer Function Technique</b> .....	74
<i>L. Harris, K.R. Holland</i>	
<b>Accuracy Issues in Loudspeaker Simulation</b> .....	88
<i>P.C. Macey</i>	
<b>Insights Into Loudspeaker Diaphragm Radiation Using the Finite and Boundary Element Methods</b> .....	96
<i>K. Griffiths</i>	
<b>A New Methodology for the Acoustic Design of Compression Driver Phase-plugs with Concentric Annular Channels</b> .....	117
<i>M. Dodd, J. Oclee-Brown</i>	
<b>An Introduction to a Generalised Theory for Sound Field Reproduction</b> .....	138
<i>F. M. Fazi, P.A. Nelson, R. Potthast, J. Seo</i>	
<b>Has Ambisonics Come of Age?</b> .....	148
<i>B. Wiggins</i>	
<b>Auralisation Level Calibratoin</b> .....	164
<i>S. Di Rosario, A. Meachin</i>	
<b>Assessing the Potential Intelligibility of Deaf Aid Loop and Other Assitive Audio Systems</b> .....	181
<i>P. Mapp</i>	
<b>Optimisation of Speech Intelligibility in Multi-Source Envitonmrntd using Delay Spread Minimisation</b> .....	191
<i>E. Start</i>	
<b>Speech Transmission Index: Too Weak in Time and Frequency?</b> .....	200
<i>T. Steinbrecher</i>	
<b>Early Reflections in Mobile Sound Control Rooms</b> .....	213
<i>R. Walker</i>	

<b>3-Dimensional Room Impulse Response Measurements in Critical Listening Spaces</b> .....	231
<i>B. Fazenda, J. Romero</i>	
<b>Taking Head Movements Into Account in Measurement of Spatial Attributes</b> .....	239
<i>R. Mason, C. Kim, T. Brookes</i>	
<b>Composing with Waveholes and Microsounds</b> .....	247
<i>P.J. Villez</i>	
<b>C'MON Feel the Noise (or How Green is My Sound)</b> .....	264
<i>S.P. Jones</i>	
<b>Real Time Measurements - Theory and Praxis</b> .....	273
<i>W. Ahnert, M. Bailey, S. Feistel, P. Mapp</i>	
<b>Calibration of the Qestral Model for the Prediction of Spatial Quality</b> .....	280
<i>R. Conetta, M. Dewhurst, F. Rumsey, S. Zielinski, P.J.B. Jackson, S. Bech, D. Meares, S. George</i>	
<b>Predicting Intelligibility in Noisy Rooms</b> .....	290
<i>S.M. Jelfs, M. Fedeski, J.F. Culling</i>	
<b>Uncovering the Multidimensional Perceptual Space of Low Bit-rate Multi-channel Audio Codecs</b> .....	296
<i>P. Marins, F. Rumsey, S. Zielinski</i>	
<b>Comparison Between Column Speakers and Flat Panel Speakers in a Metro Station by Odeon</b> .....	305
<i>K. Saher, N. Hill, J. Clouston</i>	

**Author Index**