

First Australasian Acoustical Societies' Conference 2006

ACOUSTICS 2006: Noise of Progress

**Christchurch, New Zealand
20 – 22 November 2006**

Editors:

Terrance McMinn

**ISBN: 978-1-62748-001-7
ISSN: 1446-0998**

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



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

Copyright© (2006) by the Australian Acoustical Society
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the Australian Acoustical Society
at the address below.

Australian Acoustical Society
P. O. Box 2183
Magill North S.A. 5072
Australia

Phone: (08) 7225 0112

Fax: (08) 7225 0112

GeneralSecretary@acoustics.asn.au

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Acoustics 2006: Noise of Progress

Contents

KEYNOTE PAPERS

Sounds interesting: Wavefronts, caustics, whales and reefs Chris Tindle	11
Building acoustics: From prediction models to auralization Michael Vorländer	15

Active Noise and Vibration

Spatial control of far-field structural sound radiation using structural sensors for broadband applications Halim, D. and Cazzolato, B.S.	25
Consideration of the power flow re-direction for creating a zone of quiet (vibration) in structures Halim, D., Tanaka, N. and Cazzolato, B.S.	31
An active control strategy for achieving general cluster control in structural-acoustic systems Halim, D., Tanaka, N. and Cazzolato, B.S.	37
Control of the spatially-weighted vibration of an arbitrary structure using an adaptive control strategy Halim, D. and Cazzolato, B.S.	43
Active random vibration control for stochastic piezoelectric truss structures Wei Gao	49
Feasibility study of localised active noise control using an audio spotlight and virtual sensors M. R. F. Kidner, C. Petersen, A. C Zander and C. H. Hansen	55
An industrial ANC application for an enclosure Guillaume Barrault, Dunant Halim, Colin Hansen and Arcanjo Lenzi	63
Effect of reflecting surfaces on the performance of active noise control Jie Pan, Xiaojun Qiu and Roshun Paurobally	69
The elusive cost function for tuning adaptive Helmholtz resonators Sarabjeet Singh, Colin H. Hansen and Carl Q. Howard	75

Aircraft Noise

Experimental Investigation - Effects of an Acoustically Absorptive Ceiling on the Aircraft Noise Reduction of An Open and Semi-Enclosed Outdoor Structure Michael Caley and John Savery	85
Problems with the INM: Part 1 – Lateral Attenuation Steven Cooper	91
Problems with the INM: Part 2 – Atmospheric Attenuation Steven Cooper	99
Problems with the INM: Part 3 – Derivation of NPD Curves Steven Cooper	105
Adelaide Airport Noise Insulation Program – Noise Insulation Works At St. George College Ivailo Dimitrov and Elizabeth Cheng	113
Aircraft noise intrusion: a practical study of glazing performance under high aircraft noise conditions for residential developments Ross Leo	117

Building Acoustics

Modelling of light weight floor/ceiling structures Hyuck Chung	123
Following sound through a crack C.G. Don and G.G. Swenson	127
The directivity of sound radiated from a panel or opening excited by sound incident on the other side John Laurence Davy and Vladimir Pavasovic	133
Making and Using Building Insulation Measurements G. Dodd, G. Schmid, and M. Li	141
Improving the Impact Insulation of Light Timber Floors Grant Emms, Hyuck Chung, Ken McGunnigle and George Dodd	147

Curing time required to achieve stable sound transmission loss through masonry walls Matthew Fishburn and Stephen Gauld.....	155
Communicating performance effectively – the only hope of solving the problem of noise transference between attached domestic dwellings? Robert Hanson	161
Experimental validation of a model for the transmission loss of a plate with an array of lumped masses Carl Howard and Mike Kidner.....	169
Comparison of low frequency sound insulation field measurement methods Sandy Marshall, Doheon Lee and Densil Cabrera.....	179
Sound transmission through suspended ceilings beneath floors Thomas Scelo and C. Roger Halkyard.....	187
Acoustics laboratory fire at the University of Sydney Ken Stewart, Densil Cabrera and Fergus Fricke.....	193
Horizontal Impact Sound Insulation: Field Observations Michael Sullivan, Richard Finley and Arif Zaher.....	201
A review of the New Zealand Building Code Peter Thorby	207
Revisions to the noise requirements of the Building Code and Compliance Documents Peter Thorby	209
Electroacoustics	
Speech intelligibility in a highly reverberant cathedral Larry Elliott, Miklin Halstead and Chris Cullinane	213
The Control of Early and Late Energy Using the Variable Room Acoustics System Mark Poletti	215
Arbitrary Audio FIR Filter Design by Bode Plot Smoothing using Tuneable Approximate Piecewise Linear Regression Anthony Zaknich, Gareth E Lee.....	219
Environmental Noise	
Investigation into the Effect of Speed Variation on the Growth of Wear-Type Rail Corrugation P.A. Bellette, P.A. Meehan and W.J.T. Daniel.....	227
Prediction of Crowd Noise M. J. Hayne, R.H. Rumble and D.J. Mee.....	235
Experimental Outdoor Sound Propagation Najah Ishac and Robert Bullen.....	241
Assessment and regulation of environmental noise – an Australian and New Zealand comparison Rachel Foster	245
Carrying out noise assessments for proposed childcare facilities Ken Scannell and Matthew Harwood	249
Industrial Noise	
Measurement of the sound transmission loss of a small expansion chamber muffler to consider the effects of mean flow and wall compliance K. Byrne, M. Skeen and N. Kessissoglou	257
Calculation of insertion losses of pipe lagging: A Matlab computer program M. J. Lacin and S. Kanapathipillai	265
Vibration Is Not The Only Method For Balancing Byron Martin	271
Experimental investigation of noise generation from the two stage expansion of a round air jet James Neale	275
Directivity Loss at a Duct Termination Daniel Potente, Stephen Gauld and Athol Day.....	283
Occupational Noise	
Occupational noise criteria and ‘Action Levels’ Marion Burgess and Warwick Williams	293
Noise Control in a Sample Preparation Room Jingnan Guo and Jie Pan.....	297
Quantifying the risks from listening to personal stereos Warwick Williams.....	303

Road Noise

Dynamic Measurement of Tyre/Road Noise Gillian Adams, Frits Kamst, Stephen Pugh and Dave Claughton	309
The Effects and Significance of New Zealand Road Surfaces on Traffic Noise Vince Dravitzki, Darren Walton, and Igor Kvatch.....	313
Stone Mastic Asphalt – A review of its noise reducing and early life skid resistance properties Gayle Greer.....	319
Introduction to the Revised – Queensland Department of Main Roads Road Traffic Noise Management: Code of Practice Arthur Hall.....	325
Improving the management of state highway traffic noise in New Zealand Rob Hannaby	333
Assessing risks associated with simple algorithms for calculating effects due to partial enclosure of a road Cornelius (Neil) Huybregts, Stephen Chiles.....	335
Noise Camera: Automated Detection Technology to Identify Noisy Vehicles Andrew Klos.....	343
Effective Noise Barrier Design and Specification Giles Parker	349
Successful Noise Barrier Case Studies for Transport and Industrial Sources Giles Parker	355
Pavement surfaces and in-cabin noise levels Jeffrey Parnell and Stephen Samuels.....	363
A comparison of tyre/road noise generated on NSW pavements to international studies Jeffrey Parnell and Stephen Samuels	369
The Long Term Road Traffic Noise Attributes of Pavement Surfaces in Queensland Stephen Samuels and Arthur Hall.....	377

Room Acoustics

Using sonification for teaching acoustics and audio Densil Cabrera, Sam Ferguson and Robert Maria.....	383
Is the Press noisier than a typical Café? Stuart Camp	391
Some issues in measurement of the random-incidence scattering coefficients in a reverberation room Young-Ji Choi, Dae-Up Jeong and Ji-Young Kim.....	393
A Statistical Approach to Concert Hall Acoustical Design Fergus Fricke, Joseph Nannariello.....	399
Acoustics and a sound system of a university auditorium hall in Wyższa Szkoła Menedzerska in Warsaw – design and results Michal Kaminski	405
Improving the upright piano Martin Keane	413
Auditory Room Size Perception: A Comparison of Real versus Binaural Sound-fields Densil Cabrera, Claudiu Pop and Daeup Jeong	417
Classroom Acoustics - Controlling the Cafe Effect... is the Lombard Effect the key? James Whitlock and George Dodd	423

Thermoacoustics

Impedance correction for a branched duct in a thermoacoustic air-conditioner Carl Howard.....	429
Modelling and optimisation of acoustic inertance segments for thermoacoustic devices Luke Zoontjens, Carl Q. Howard, Anthony C. Zander, Ben S. Cazzolato.....	435

Underwater

Techniques for extraction of the waveguide invariant from interference patterns in spectrograms Laura A. Brooks, M. R. F. Kidner, Anthony C. Zander, Colin H. Hansen and Z. Yong Zhang.....	P IC
Passive acoustics for monitoring marine animals - progress and challenges Douglas Cato, Robert McCauley, Tracey Rogers and Michael Noad	453
Directionality of acoustic T-phase signals in the South Fiji Basin N. Ross Chapman and Ralph Marrett	461
High Frequency Performance of Arc Arrays Using Adaptive Beamforming Chaoying Bao and Derek Bertilone	467
A Consistent, User Friendly Interface for Running a Variety of Underwater Acoustic Propagation Codes Alec J Duncan, Amos L Maggi	471

Hydroacoustic observation of Antarctic ice disintegration events in the Indian Ocean B. Li and A. N. Gavrilov	479
Analysis and Simulation of an Extended Data Set of Waveforms Received from Small Explosions in Shallow Oceans Adrian D. Jones, Amos L. Maggi, Paul A. Clarke and Alec J. Duncan.....	485
Current technology of fisheries acoustics based on analyzed acoustic data using SonarData's Echoview Myounghee Kang	493
Spawning sounds of the mullo way (Argyrosomus japonicus) Parsons, M.J.G., McCauley, R.D. and Mackie, M.C.....	499
Statistical analysis of high-frequency multibeam backscatter data in shallow water P.J.W. Siwabessy, A.N. Gavrilov, A.J. Duncan and I.M. Parnum	507
Multichannel Communication based on Adaptive Equalization in Very Shallow Water Acoustic Channels Bien Aik Tan, Mehul Motani, Mandar Chitre and Swee Sen Quek	515
Inversion of Lloyd Mirror Field for Source Track Information Michael J. Wilmut and N. Ross Chapman	523
Vibration	
Mid-Frequency Modelling of the Vibroacoustic Responses of Structures with Uncertainties Lucas, G. and Kessissoglou, N.J.	531
Evaluation of Footfall Vibration in Commercial Buildings Tim Marks	537
Simulation of the vibrations produced by extended bearing faults in gearboxes N. Sawalhi and R.B. Randall.....	541
Wind Farms	
Wind turbine and wind farm sound levels - a prototype journey Geoff Henderson	551
Review of the application of NZS6808 to wind farms in Australia W Les Huson	557
Complaints from noise of wind turbines – Australian and New Zealand experience Colin Tickell.....	563
Acoustic Assessment of Wind Farms – A Practical Perspective Peter Teague and Rachel Foster	571