

# **12th Anglo-French Physical Acoustics Conference**

**(AFPAC 2013)**

**Journal of Physics: Conference Series Volume 498**

**Frejus, France  
16 – 18 January 2013**

**ISBN: 978-1-63266-723-6  
ISSN: 1742-6588**

**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© by the Institute of Physics  
All rights reserved.

Printed by Curran Associates, Inc. (2014)

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

Institute of Physics  
Dirac House, Temple Back  
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481  
Fax: 44 1 17 920 0979

[techtracking@iop.org](mailto:techtracking@iop.org)

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

<b>Can Airborne Ultrasound Monitor Bubble Size In Chocolate?</b> .....	1
<i>N. Watson, T. Hazlehurst, M. Povey, J. Vieira, R. Sundara, J. Sandoz</i>	
<b>Laser Vibrometry Characterisation of a Microfluidic Lab-on-a-Chip Device: A Preliminary Investigation</b> .....	14
<i>C. Fury, P. Gelat, P. Jones, G. Memoli</i>	
<b>Enzyme Activity Determination Using Ultrasound</b> .....	24
<i>M. Holmes, T. Southworth, N. Watson, M. Povey</i>	
<b>HIFU Scattering By The Ribs: Constrained Optimisation With A Complex Surface Impedance Boundary Condition</b> .....	36
<i>P. Gelat, G. Haar, N. Saffari</i>	
<b>Multiple Scattering In Dispersions, For Long Wavelength Thermoacoustic Solutions</b> .....	47
<i>T. Hazlehurst, O. Harlen, M. Holmes, M. Povey</i>	
<b>Experimental Measurements Of The Coherent Field Resulting From The Interaction Of An Ultrasonic Shock Wave With A Multiple Scattering Medium</b> .....	55
<i>N. Viard, B. Gianmarinaro, A. Derode, C. Barriere</i>	
<b>Determination Of The Effective Mechanical Properties Of Inclusionary Materials Using Bulk Elastic Waves</b> .....	61
<i>G. Lepert, C. Aristegui, O. Poncelet, T. Brunet, C. Audoly, P. Parneix</i>	
<b>Simulation Of Ultrasonic Wave Propagation In Welds Using Ray-Based Methods</b> .....	70
<i>A. Gardahaut, K. Jezzine, D. Cassereau, N. Leymarie</i>	
<b>ATHENA 3D: A Finite Element Code For Ultrasonic Wave Propagation</b> .....	77
<i>C. Rose, F. Rupin, T. Fouquet, B. Chassignole</i>	
<b>Edge Diffraction Coefficients Around Critical Rays</b> .....	88
<i>L. Fradkin, M. Harmer, M. Darmon</i>	
<b>Modelling Of Waves Propagation On Irregular Surfaces Using Ray Tracing And GTD Approaches: Application To Head Waves Simulation In TOFD Inspections For NDT</b> .....	98
<i>A. Ferrand, M. Darmon, S. Chatillon, M. Deschamps</i>	
<b>A Modal Formulation For The Propagation Of Guided Waves In Straight And Curved Pipes And The Scattering At Their Junction</b> .....	110
<i>M. Bakkali, A. Lhemery, V. Baronian, S. Grondel</i>	
<b>EMAT Generation Of Bulk Forces In A Ferromagnetic Plate And Their Equivalent Surface Stresses</b> .....	121
<i>C. Rouge, A. Lhemery, C. Aristegui</i>	
<b>Frequency Spectra Of Magnetostrictive And Lorentz Forces Generated In Ferromagnetic Materials By A CW Excited EMAT</b> .....	132
<i>C. Rouge, A. Lhemery, C. Aristegui</i>	
<b>Author Index</b>	