

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Thursday - 22 October 2009

- 800 Registration
850 Welcome & Opening address: **George Akhras**
900 **Session # 1**: Moderator: **George Akhras**

Keynote speaker: **Jack Smith**

Federal S & T Initiatives, Defence R & D Canada

**Prospecting Security and Prosperity Implications of Convergent
Technologies & Materials 2010-2025**

945 Coffee Break

1015 Session # 2: Moderator: **Leon Cheng**

- 1015 Active Material Based Active Sealing Technology - Part 2: Dielectric Elastomer and SMA Approaches

C. Henry¹, W. Carter¹, G. Herrera¹, G. McKnight¹, A. Browne², N. Johnson², I. Bazzi²

¹HRL Laboratories LLC

²General Motors

- 1035 Adaptive Pendulum Mass Damper for the Control of Structural Vibrations

R. Lourenco¹, A. J. Roffel², S. Narasimhan²

¹Dept of Mechanical and Mechatronics Engineering, University of Waterloo

²Dept of Civil and Environmental Engineering, University of Waterloo, Waterloo

- 1055 Design of Active Noise and Vibration Control for Car Oil Pans Using Numerical Simulations

S. Ringwelski, T. Luft, U. Gabbert

Dept of Mechanical Engineering, Otto-von-Guericke University of Magdeburg, Germany

- 1115 Intelligent Controller for Smart Base Isolation of Masonry Structures

S. Laflamme¹, T.-Y. Yu² and J. J. Connor¹

¹Department of Civil and Environmental Engineering, Massachusetts Institute of Technology

²Department of Civil and Environmental Engineering, University of Massachusetts Lowell

- 1135 Achieving Consistent SMA Actuation Times Under Varying Ambient Thermal Conditions

Hien Goi¹, Mohamed El Dib², Xiujie Gao³, Alan Browne³, Nancy Johnson³, Rob Gorbet²

¹Department of Electrical and Computer Engineering, University of Toronto

²Department of Electrical and Computer Engineering, University of Waterloo

³General Motors R&D, Vehicle Development Research Lab

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Thursday - 22 October 2009

1155 Session # 3: Poster & Booth Presentation

Moderator: **Hubert King**

- * A Feedback-Based Dynamic Instrument for Measuring Mechanical Properties of Soft Tissues for Minimally-Invasive Surgery
M. Heydari Araghi, S. P. Salisbury
Dept. of Electrical & Computer Engineering, University of Western Ontario, London, ON
- * Effect of Different Adhesives on Strength, Energy Absorption and Damping Properties of Bonded Aluminum Structures for the Transportation Industries
Michel Guillot, Isabelle Bouchard
REGAL, Aluminum Research Center, Mechanical Engineering Dept, Laval Univ, Quebec City, QC
- * Temperature Measurement of Shape Memory Alloy Wires with Spot Welded Thermocouples
H.L. Ma¹, X. Gao², R. Culham¹, R. Gorbet³
¹Department of Mechanical and Mechatronics Engineering, University of Waterloo,
²General Motors R&D, Vehicle Development Research Lab,
³Department of Electrical and Computer Engineering, University of Waterloo
- * Active Buckling Control of Beams Using Piezoelectric Actuators and Strain Gauge Sensors
Q. S. Wang and S. C. Shrivastava
Department of Civil Engineering and Applied Mechanics, McGill University, Montreal, QC
- * Generation and Detection of Guided Acoustic Waves for NDT Using High Temperature Wedges
K.-T. Wu¹, C.-K. Jen², R. Murayama^{2,3}, J.E.B. Oliveira^{2,4}
¹Dept of Electrical and Computer Engineering, McGill University, Montreal, QC
²Industrial Materials Institute, National Research Council, Boucherville, QC
³Faculty of Engineering, Fukuoka Institute of Technology, Fukuoka, Japan
⁴CTA-ITA-IEEC, 12225 Sao Jose Dos Campos, Sao Paulo, Brazil
- * A Two-Step Identification Procedure for the Identification of Distributed Material Constitutive Parameters from Surface Displacement Measurements
L. Li, F. Ghib, W. Polies
Department of Civil and Environmental Engineering, University of Windsor, ON
- * Guided Plate Acoustic Waves Transducers for Structural Health Monitoring
W.-L. Liu¹, K.-T. Wu¹, M. Kobayashi², C.-K. Jen² and N. Mrad³
¹Department of Electrical and Computer Engineering, McGill University, Montreal, QC
²Industrial Materials Institute, National Research Council of Canada, Boucherville, QC
³Dept of National Defence, Defence R&D Canada, Air Vehicles Research Section, Ottawa, ON

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Thursday - 22 October 2009

* **Booth Presentations**

1245 Lunch

1350 Session # 4: Moderator: C.K. Jen

1350 Strain-Based Energy Harvesting for Structural Health Monitoring

Sébastien Debeaux, Patrice Masson and Luc Fréchette

Mechanical Engineering Department, Université de Sherbrooke, Sherbrooke, QC

1410 Energy Harvesting and Embedded RF Wireless Sensor Systems for Helicopter Blades

A. Fang, M. Bryant, E. Garcia

Sibley School of Mechanical and Aerospace Engineering, Cornell University

1430 A Dynamical Sensing Model for Magnetostrictive Galfenol with Applications to Energy Harvesting

Philip Weetman and George Akhras

Centre for Smart Materials and Structures, Royal Military College of Canada, Kingston, ON

1450 Development of Energy Harvesting Modules Based on Piezoceramics

V. Kulkarni¹, D. Waechter³, R. Ben Mrad¹, T. El-Diraby², N. Somayajula³, S. Nema³, E. Prasad³

¹Dept of Mechanical & Industrial Engineering, University of Toronto, ON

²Dept of Civil Engineering, University of Toronto, ON

³Sensor Technology Limited, Collingwood, ON

1510 Power for Wireless Sensors

Nezih Mrad¹, Missy Alphonse Fabien² and Farid Mabrouki²

¹Defence R&D Canada, Department of National Defence, Ottawa

²Institute for Aerospace Research, National Research Council, Ottawa

1530 Electromechanical Performances of Different Shapes of Piezoelectric Energy Harvesters

Simon Paquin and Yves St-Amant

LSMI, Mechanical Engineering Department, Université Laval, Québec City, QC

1550 Coffee Break

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Thursday - 22 October 2009

1620 Session # 5: Moderator Robert Gorbet

1620 High Temperature Integrated Ultrasonic Transducers for Engine Condition Monitoring

M. Kobayashi¹, K.-T. Wu², C.-K. Jen¹, J. Bird³, B. Galeote³ and N. Mrad⁴

¹Industrial Materials Institute, National Research Council, Boucherville, Quebec

²Department of Electrical and Computer Engineering, McGill University, Montreal

³Institute for Aerospace Research, National Research Council, Ottawa

⁴Dept of National Defence, Defence R&D Canada, Air Vehicles Research Section, Ottawa

1640 Identification of Stiffness Distribution and Damage in Euler-Bernoulli Beams Using Static Response

L. Li, F. Ghrib and W. Polies

Department of Civil and Environmental Engineering, University of Windsor, ON

1700 High Temperature Flexible Ultrasonic Transducers for Structural Health Monitoring and NDT

J.-L. Shih¹, M. Kobayashi², C.-K. Jen², J. Tatibouët² and N. Mrad³

¹Department of Electrical and Computer Engineering, McGill University, Montreal, QC

²Industrial Materials Institute, National Research Council of Canada, Boucherville, QC

³Dept of National Defence, Defence R&D Canada, Air Vehicles Research Section, Ottawa, ON

1720 Structural Health Monitoring Using Vibration-Based Methods and Statistical Pattern Recognition Techniques

Ahmed S. Noman, Farah Deeba, Ashutosh Bagchi

Dept of Building, Civil and Environmental Engineering, Concordia University, Montreal, QC

1800 Posters, Booth & Reception

1915 Dinner

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Friday - 23 October 2009

830 Registration

900 Session # 6: Moderator: Robert Gorbet

- 900 Compact Piezoworm Actuator for MR-Guided Surgical Needle Procedures
K. El Bannan, S. Salisbury
Department of Mechanical and Materials Engineering, University of Western Ontario, London, ON
- 920 Mechanical Characterization of porous Membrane core morphologies for
conductive polymer trilayer actuators
A.D. Price, V.C. Kao, J.X. Zhang, H.E. Naguib
Smart and Adaptive Polymers Lab, Dept of Mechanical and Industrial Eng, University of Toronto
- 940 Development of a Smart Material Based Microvascular Clamp
T. Rost, J.H. Koo, F. Khan
Department of Mechanical and Manufacturing Engineering, Miami University
- 1000 Polypyrrole Driven Catheter
Tina Shoa, John D.W. Madden, Nigel Munce, Kenneth Lee, Victor Yang
University of British Columbia, Vancouver, BC.

1020 Coffee Break

10151050 Session # 7: Moderator: Leon Cheng

- 1050 The Influence of Reactive Sintering Process Parameters on the Martensite to
Austenite Phase Transformation of NiTi
D. Cluff¹, S.F. Corbin¹, R.B. Gorbet²
¹Materials Engineering & Processing Group, Dept of Mechanical & Mechatronics Engineering
²Dept of Electrical and Computer Engineering, University of Waterloo, ON
- 1110 Modelling of Piezoelectric Fiber Composite Material for Ultrasonic Wave
Generation
Y. Pasco, P. Masson
Mechanical Engineering Department, Université de Sherbrooke, Sherbrooke, QC
- 1130 Powder Metallurgy Fabrication of Hybrid Monolithic SMA Actuators
Dan Cluff¹, Stephen Corbin¹, Rob Gorbet²
¹Department of Mechanical and Mechatronics Engineering, University of Waterloo
²Department of Electrical and Computer Engineering, University of Waterloo

CANSMART 2009
International Workshop
SMART MATERIALS AND STRUCTURES
Montreal, Quebec, Canada
Friday - 23 October 2009

1150 Preliminary Assessment of Manufacturing Impacts on Dielectric Elastomer Actuators Reliability

J. Lucking Bigué, P. Chouinard, S. Proulx, G. Miron, J. Plante

Department of Mechanical Engineering, Université de Sherbrooke, QC

1210 Stationary Hadamard Shutter Based on Semiconductor-To-Metallic Phase Transition of Thermo-chromic W-Doped VO₂ Arrays

M. Soltani¹, M. Chaker¹, E. Haddad², R. V. Kruzelecky² and J. Margot³

¹INRS-Énergie, Matériaux et Télécommunications, 1650 Lionel-Boulet, Varennes, QC

²MPB Communications Inc., 151 Hymus Boulevard, Pointe Claire, QC

³Université de Montréal, Département de Physique, Montréal, QC

1230 *Wrap up*

1245 *Lunch*