

**Room A**

**Structural Analysis and Design II**

Chairs: Prof. Yan Shi and Prof. Yasutomo Uetsuji

- 9:00 – 9:20 O-64 **A Crack Parallel to the Interface Between a Functionally Graded Thermal Barrier Coating and a Homogeneous Elastic Substrate under Transient Thermal Loading**  
Yasuhiko Masaoka and Sei Ueda  
Osaka Institute of Technology, Japan
- 9:20 – 9:40 O-65 (Invited) **Plane axisymmetric unsteady thermal stress in an inhomogeneous hollow circular cylinder due to cyclic heat supply**  
Hiromu Kanemaru<sup>1</sup>, Ryuusuke Kawamura<sup>1</sup> and Yoshinobu Tanigawa<sup>2</sup>  
1 University of Miyazaki, Japan  
2 Professor Emeritus, Osaka Prefecture University, Japan
- 9:40 – 10:00 O-66 **Design, Fabrication and Characterization of Fe-Co Magnetostrictive Fiber/Epoxy Composite Materials with Villari Effect**  
Kenichi Katabira<sup>1</sup>, Yu Yoshida<sup>1</sup>, Atsuji Masuda<sup>2</sup>, Akihito Watanabe<sup>3</sup> and Fumio Narita<sup>1</sup>  
1 Tohoku University, Japan; 2 Industrial Technology Center of Fukui Prefecture, Japan  
3 Sakase Adtech Co., Ltd., Japan
- 10:00 – 10:20 O-67 **Direction-switchable functionally graded acoustic diodes**  
Yingjie Chen, Yang Huang and Weiqiu Chen  
Zhejiang University, P. R. China
- 10:20 – 10:40 O-68 (Invited) **Assembly of Isolated Three-Dimensional Origami Structures and Their Applications**  
Yan Shi<sup>1</sup>, Yihui Zhang<sup>2</sup> and Cunfa Gao<sup>1</sup>  
1 Nanjing University of Aeronautics & Astronautics, P. R. China  
2 Tsinghua University, P. R. China.
- 10:40 – 11:10 Break

**Room B**

**Environmental Coatings and Evaluation**

Chairs: Prof. Masahiko Kato and Prof. Hiroyuki Waki

- 9:00 – 9:30 O-69 (Keynote) **Functionally Graded Thermal Barrier Coatings Fabricated by Cold Spray**  
Kazuhiro Ogawa, Takumi Kitahara and Yuji Ichikawa  
Tohoku University, Japan
- 9:30 – 9:50 O-70 (Invited) **Influence of Heat Cycles on Hardness and Young's Modulus of Thermal Barrier Coatings Measured by Nano-indenter**  
Masahiko Kato<sup>1</sup>, Taichi Iwata<sup>2</sup>, Hiroyuki Akebono<sup>2</sup> and Atsushi Sugeta<sup>2</sup>  
1 Fukuyama University, Japan  
2 Hiroshima University, Japan
- 9:50 – 10:10 O-71 **Effect of Heat Treatment on Young's Modulus and Poisson's Ratio of Thermal Barrier Coating Evaluated by Bending of Three-Layered Specimen**  
Tomoyuki Hayase and Hiroyuki Waki  
Iwate University, Japan
- 10:10 – 10:30 O-72 (Invited) **Thermal diffusivity of thermal barrier coating from room temperature up to high temperature**  
Megumi Akoshima<sup>1</sup> and Satoru Takahashi<sup>2</sup>  
1 National Metrology Institute of Japan, AIST, Japan  
2 Tokyo Metropolitan University, Japan
- 10:30 – 10:50 O-73 (Invited) **Evaluation of Thermal Conductivity for Suspension Plasma Sprayed Mullite Coating**  
Keiko Kikuchi<sup>1</sup>, Naoyuki Nomura<sup>1</sup>, Akira Kawasaki<sup>1</sup>, Kazuo Noda<sup>2</sup>, Mikako Nagao<sup>2</sup>, Yoichiro Habu<sup>2</sup> and Yoshiyasu Itoh<sup>2</sup>  
1 Tohoku University, Japan; 2 TOCALO Co., Ltd, Japan
- 10:50 – 11:10 Break

**Room C**

**Manufacturings**

Chairs: Prof. Michael Gasik and Dr. Seungchan Cho

- 9:20 – 9:40 O-74 **State of the Art Functionally Graded Materials: Classifications from Industrial Point of View**  
I. M. El-Galy, B. I. Bassiouny and M. H. Ahmed  
Alexandria University, Egypt
- 9:40 – 10:00 O-75 **Fabrication And Characterization Of Functionally Graded Fe/W Composites**

S. Heuer<sup>1</sup>, J. Matejíček<sup>2</sup>, M. Vilémová<sup>2</sup>, T. Lienig<sup>1</sup>, G. Pintsuk<sup>1</sup>, J.W. Coenen<sup>1</sup>, W. Theisen<sup>3</sup> and Ch. Linsmeier<sup>1</sup>,  
1 Institut für Energie und Klimaforschung -Plasmaphysik, Germany; 2 Institute of Plasma Physics AS CR, v. v. i.,  
Department of Materials, Czech Republic; 3 Lehrstuhl Werkstofftechnik, Ruhr-Universität Bochum, Germany

10:00 – 10:20 O-76

**Construction of LiCoO<sub>2</sub>-Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> Graded Composite Cathode Materials for All-solid-state Batteries**

Shangbin Song, Fei Chen, Wenping Zha, Dunjie Yang, Qiang Shen and Lianmeng Zhang  
Wuhan university of technology, P. R. China

10:20 – 10:40 O-77

**Fabrication of microstructure gradation in Ti-48Al-2Cr-2Nb alloys by electron beam melting**

M. Todai<sup>1</sup>, T. Nakano<sup>2</sup>, J.Y. Oh<sup>2</sup>, K. Cho<sup>2</sup>, H.Y. Yasuda<sup>2</sup>, K. Hagihara<sup>2</sup>, A. Ikeda<sup>3</sup>, M. Ueda<sup>4</sup>, and M. Takeyama<sup>5</sup>  
1 Institute of Niihama National College of Technology, Japan; 2 Osaka University, Japan; 3 National Institute for  
Materials Science, Japan; 4 Metal Technology Co. Ltd., Japan; 5 Tokyo Institute of Technology, Japan

10:40 – 11:10

Break

**Main Hall**

**Closing Ceremony**

Chair: Prof. Shinji Munetoh

11:10 – 11:40

**Closing Address**

Prof. Akira Kawasaki (President, Functionally Graded Materials Forum, Japan)

11:40 – 13:00

Exhibition & Lunch

13:00 – 17:30

**Technical Tour**