Forward: 6th international conference on mechanics of time-dependent materials, Monterey, CA, March 30–April 4, 2008

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The papers identified below were organized and reviewed by the identified guest editors, who were respectively the chair and co-chairs of the subject conference. Special acknowledgements are appropriate for Prof. Krishnaswamy Ravi-Chandar, who directed the University of Texas in its generous coordination of the financial obligations of the event; his assistant, Ms. Kate Joly; and Ms. Barb Hager and Ms. Sandy Miller, who support AFRL and provided substantial assistance with the event. The success of the event depended critically on support from each one of them. We are also indebted to Ms. Jana Jarm, who traveled from Slovenia to help out on-site. Although most of the papers were associated with the conference and are identified below by an asterisk, a few additional papers were reviewed by the guest editors in the course of managing several of the issues, and they are listed here as well.

The theme of the conference was to address constitutive, time (rate)-dependent behavior of all materials, involving non-negligible time-dependent mechanical response in cases involving non-mechanical fields.

Papers dealing with modeling and experimental aspects of the subject area were sought. Topics included, but were not limited to: characterization and modeling of behavior at multiple scales (which included scales ranging from molecular dynamics to civil structures); viscoelasticity, viscoplasticity; transport, chemically and electromagnetically active processes;

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multiphase and biomaterial systems; thermodynamics; shape memory; mechanics of testing; micro/nanoindentation on time-dependent materials; dynamic rate-dependent behaviors; large deformations; residual stresses; time (rate)-dependent damage and failure; time (rate)-dependent polycrystalline, single crystal and nanocrystalline behaviors; multifunctional materials; mechanics of processing; design methods; environmental interactions; experimental methods and techniques; linear and non-linear time-dependent behavior; time (rate)-dependent composite materials of all types; numerical analysis; physical aging; rheological properties; temperature, pressure, and moisture effects on time dependence; damping; related topics.

The guest editors wish to convey their appreciation to the journal chief editors and its readers, to the associated staff at Springer, and the authors who made this endeavor a success and a pleasure to coordinate.

Guest Editors

Volume 12

Number 1 / March, 2008

A quasi-correspondence principle for quasi-linear viscoelastic solids

K. R. Rajagopal and A. S. Wineman

A time and hydration dependent viscoplastic model for polyelectrolyte membranes in fuel cells

Roham Solasi, Yue Zou, Xinyu Huang and Kenneth Reifsnider

High-temperature tensile-hold crack-growth behavior of HASTELLOY® X alloy compared to HAYNES® 188 and HAYNES® 230® alloys*

S. Y. Lee, Y. L. Lu, P. K. Liaw, H. Choo, S. A. Thompson, J. W. Blust, P. F. Browning, A. K. Bhattacharya, J. M. Aurrecoechea and D. L. Klarstrom

Evolution of stress and deformations in high-temperature polymer matrix composites during thermo-oxidative aging

K. V. Pochiraju, G. P. Tandon and G. A. Schoeppner

A micro-to-meso sublaminate model for the viscoelastic analysis of thick-section multi-layered FRP composite structures*

Rami Haj-Ali and Anastasia Muliana

Number 2 / June, 2008

On the development and parameter identification of Schapery-type constitutive theories

Martin Lévesque, Katell Derrien, Didier Baptiste and Michael D. Gilchrist

Free damped vibrations of a viscoelastic oscillator based on Rabotnov's model*

Yury A. Rossikhin and Marina V. Shitikova

Generalized viscoelastic designer functionally graded auxetic materials engineered/tailored for specific task performances*

Harry H. Hilton, Daniel H. Lee and Abdul Rahman A. El Foully

The sensitivity of the time-temperature shift process to thermal variations—A note

W. G. Knauss

Number 3 / September, 2008

Impact of time-dependency on long-term material testing and modeling of polyethylene*
Jeffrey E. Bischoff

Coarse-grained molecular dynamics simulations of ionic polymer networks*
T. E. Dirama, V. Varshney, K. L. Anderson, J. A. Shumaker and J. A. Johnson

Hygrothermal characterization of the viscoelastic properties of Gore-Select® 57 proton exchange membrane

Kshitish A. Patankar, David A. Dillard, Scott W. Case, Michael W. Ellis, Yeh-Hung Lai, Michael K. Budinski and Craig S. Gittleman

Dynamic strength and failure behavior of titanium alloy Ti-6Al-4V for a variation of heat treatments*

Lothar W. Meyer, Lutz Krüger, Kristin Sommer, Thorsten Halle and Matthias Hockauf

Mechanical properties of Epon 826/DEA epoxy*
Jennifer L. Jordan, Jason R. Foley and Clive R. Siviour

On the development and parameter identification of Schapery-type constitutive theories—
Erratum

Martin Lévesque, Katell Derrien, Didier Baptiste and Michael D. Gilchrist

Number 4 / December, 2008

Mechanisms for tertiary creep of single crystal superalloy*
Alexander Staroselsky and Brice Cassenti

Static and dynamic scaling of semiflexible polymer chains—a molecular dynamics simulation study of single chains and melts*

Martin O. Steinhauser

Modelling the large strain solid phase deformation behaviour of polymer nanoclay composites*

P. E. Spencer, R. Spares, J. Sweeney and P. D. Coates

Development of a viscoelastic continuum damage model for cyclic loading*
R. W. Sullivan

Development of early age shrinkage stresses in reinforced concrete bridge decks*
Gergis W. William, Samir N. Shoukry and Mourad Y. Riad

Change in dynamic parameters and safety assessment of civil structures*
Rosario Ceravolo, Alessandro De Stefano and Miriam Pescatore

Volume 13

Number 1 / March, 2009

Time-dependent mechanisms in fracture of paper*
Henry W. Haslach

High rate material behaviour at hot forming conditions*

Lothar W. Meyer, Corinna Kuprin and Thorsten Halle

Number 2 / June, 2009

Tensile Properties of Latex Paint Films with TiO_2 Pigment*

Eric W. S. Hagan, Maria N. Charalambides, Christina T. Young, Thomas J. Learner, Stephen Hackney

*Presented at MTDM2008 conference.