Journal of Engineering Materials and Technology

Guest Editorial

Predictive Science and Technology in Mechanics and Materials

The papers represented in this edition of JEMT were birthed from a workshop entitled "Predictive Science and Technology in Mechanics and Materials" hosted by the Center of Advanced Vehicular Systems (CAVS) on the campus of Mississippi State University on June 18–20, 2008. The purpose of the workshop was focused on technologies that could drive engineering research such that predictive tools could be realized. Several software companies and corporations that employed state-of-the-art finite element analysis to solve structural problems were present. Although some of the presenters did not submit a review article, the ones who did added more references than usual for a more thorough review on the topic at hand in this particular edition of JEMT. The topics discussed in this context are the following:

J. D. Clayton and D. J. Bammann, "Finite Deformations and Internal Forces in Elastic-Plastic Crystals: Interpretations From Nonlinear Elasticity and Anharmonic Lattice Statics."

G. Z. Voyiadjis and B. Deliktas, "Theoretical and Experimental Characterization for the Inelastic Behavior of the Micro/Nanostructured Thin Films Using Strain Gradient Plasticity With Interface Energy."

N. R. Overman, C. T. Overman, H. M. Zbib, and D. F. Bahr, "Yield and Deformation in Biaxially Stressed Multilayer Metallic Thin Films."

D. E. Spearot and D. L. McDowell, "Atomistic Modeling of Grain Boundaries and Dislocation Processes in Metallic Polycrystalline Materials."

K. S. Choi, W. N. Liu, X. Sun, and M. A. Khaleel, "Influence of Manufacturing Processes and Microstructures on the Performance and Manufacturability of Advanced High Strength Steels (AHSS)."

J. L. Bouvard, D. K. Ward, D. Hossain, S. Nouranian, E. B. Marin, and M. F. Horstemeyer, "Review of Hierarchical Multiscale Modeling to Describe the Mechanical Behavior of Amorphous Polymers."

T. M. Hatem and M. A. Zikry, "Modeling of Lath Martensitic Microstructures and Failure Evolution in Steel Alloys."

R. Agrawal and H. D. Espinosa, "Multiscale Experiments—State of the Art and Remaining Challenges."

S. Groh and H. M. Zbib, "Advances in Discrete Dislocations Dynamics and Multiscale Modeling."

S.-G. Kim, M. F. Horstemeyer, M. I. Baskes, M. Rais-Rohani, S. Kim, B. Jelinek, J. Houze, A. Moitra, and L. Liyanage, "Semi-Empirical Potential Methods for Atomistic Simulations of Metals and Their Construction Procedures."

D. S. Li, H. Garmestani, S. Ahzi, M. Khaleel, and D. Ruch, "Microstructure Design to Improve Wear Resistance in Bioimplant UHMWPE Materials."

Sincerely, the Guest Editors

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