

**Title** **Multiaxial Deformation and Fatigue Under Discriminating Strain Paths**

**Speaker** Dr. Darrell SOCIE  
Professor Emeritus, Mechanical Engineering  
University of Illinois at Urbana-Shampaign



**Date & Time** Friday, March 18, 2011 4:00p.m.

**Place** INAMORI Hall, Ito campus, Kyushu University

### Abstract

This study investigates the effect of incremental and random sequence of variable amplitude axial-torsion straining on stress response and fatigue life of 1050 QT steel with no non-proportional cyclic hardening, and 304L stainless steel with significant non-proportional cyclic hardening. Predicted stress responses based on a plasticity model using a small number of material parameters are compared with experimental observations. Variable amplitude multiaxial fatigue life estimation using a proper multiaxial cycle counting method and a multiaxial fatigue damage parameter taking into account constitutive behavior effects and reflective of the material damage mechanisms is also discussed.

### About the Speaker

Dr. Darrell Sosie received B.S. and M.S. Metallurgical Engineering from University of Cincinnati and Ph.D. Theoretical and Applied Mechanics from University of Illinois at Urbana-Champaign. He worked as a consulting engineer for Structural Dynamics Research Corporation prior to joining the University of Illinois and has remained active in industrial consulting on fatigue and fracture related problems. He has conducted design reviews and failure analysis for many mid-western manufacturing companies. He received the Commanders Award for Distinguished Public Service from the US Army for his work on pipeline failures. He is one of the founders of SoMat Corporation, a manufacturer of data acquisition and analysis systems.

**Host:** Professor Yukitaka MURAKAMI

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