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TMS 2018

147th Annual Meeting & Exhibition

MARCH 11 – 15, 2018
PHOENIX, ARIZONA

SUBMIT AN ABSTRACT TO:

MECHANICS AND STRUCTURAL RELIABILITY

DYNAMIC BEHAVIOR OF MATERIALS VIII

The dynamic behavior of materials encompasses a broad range of phenomena with technological applications in both the military and civilian sectors. Examples of such phenomena include deformation, fracture, fragmentation, shear localization, chemical reactions under extreme conditions, and processing (combustion synthesis; shock compaction; explosive welding and fabrication; shock and shear synthesis of novel materials).

It is recognized today that materials aspects are of utmost importance in dynamic events. The macromechanical and physical processes that govern the phenomena manifest themselves, at the micro structural level, by a dazzling complexity of defect configurations and effects. Nevertheless, these processes/mechanisms can be quantitatively treated on the basis of accumulated knowledge. The advent of in-situ techniques available at facilities like NIF, MARIE, LCLS, and Omega have enabled us to make significant strides towards gaining more insights into the basic mechanisms that drive materials response under dynamic loading. These, coupled with modeling tools from continuum to ab-initio computations, enable realistic predictions of material performances and are starting to guide not only the design process but also our further micromechanical understanding of deformation processes at every level, including the basic dislocation mechanisms. In addition to traditional materials, we have also made progress in understanding the extreme response of emerging materials, such as nano-crystalline, bulk metallic glasses, and high entropy alloys.

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