SHOCK09-2009-000040

Abstract for an Invited Paper
for the SHOCK09 Meeting of
the American Physical Society

The effects of shockwave profile shape and shock obliquity on spallation: studies of kinetic and stress-state effects on damage evolution and spallation[1]

GEORGE GRAY III, Los Alamos National Laboratory

While much has been learned over the past five decades concerning the kinetics of the damage evolution and spallation in shock-loaded materials these studies have focused principally on 1-D shocked samples where the shocks produced possessed "square-topped" profiles as a function of peak stress. However, considerably less is known concerning spallation resulting from direct in-contact HE-driven, where a "Taylor-wave" shockwave profile is applied let alone a sweeping detonation Taylor-wave loading stress path where the applied stress tensor evolves as a function of obliquity. In this talk the influence of HE-driven shock loading, both 1-D and as a function of shock obliquity on the damage evolution and spallation response of Cu, 1018 steel, and Ta is compared and contrasted to that seen in each material subjected to flyer-plate driven "square-topped wave" shock profile prestraining.

[1]This research supported by the US Dept. of Energy.