Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

**Plasticity mechanisms in nanovoided b.c.c. metals under high strain rate compression**[1] CARLOS J. RUESTES, Instituto de Ciencias Basicas, UNCuyo, Mendoza 5500, Argentina, EDUARDO M. BRINGA, Instituto de Ciencias Basicas & CONICET, UNCuyo, Mendoza 5500, Argentina, ALEXANDER STUKOWSKI, Technische Universitat Darmstadt, Germany, JOAQUIN F. RODRÍGUEZ NIEVA, Massachusetts Institute of Technology, MA 02139, USA, GRACIELA BERTOLINO, CONICET - Centro Atomico Bariloche, Bariloche 8400, Argentina, YIZHE TANG, Johns Hopkins University, Baltimore, MD 21212, USA, MARC A. MEYERS, University of California, San Diego, La Jolla, CA 92093, USA
— Atomistic-scale simulations provide unique insights to plasticity mechanisms arising under extreme conditions where its relative nanoscopic length and time scales render experiments almost impossible. Our studies explore the mechanical response and plasticity effects under uniaxial high strain rate compression for a Ta single crystal with a collection of spherical nanovoids, with a radius of 3-4 nm, providing an initial porosity of 5%-20%. We examine strain rate effects, from $10^7$/s to $10^{10}$/s, in the dislocation density and dislocation-induced heating. The resulting dislocation densities are in good agreement with experimental results for shock-recovered samples.

[1]This research was funded by the ANPCyT project PICT2008-1325, PICT2009-0092, PRH and 06/M035 from SecTyP-U.N.Cuyo and UC Research Labs

Carlos Ruestes
Instituto de Ciencias Basicas, UNCuyo, Mendoza 5500, Argentina

Date submitted: 21 Feb 2013 Electronic form version 1.4