Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Shock compression of Ta single crystals with dislocation sources[1]
DIEGO TRAMONTINA, Instituto de Ciencias Basicas, Universidad Nacional de Cuyo, Mendoza, M5502JMA Argentina, RAMON RAVELO, Physics Department and Materials Research Institute, University of Texas, El Paso, TX 79968, EDUARDO BRINGA, Consejo Nacional de Investigaciones Cientificas y Tecnicas, CABA, C1033AAJ Argentina — We present non-equilibrium molecular dynamics (NEMD) simulations of shock wave compression of line Tantalum single crystals including pre-existing defects, which act as dislocation sources. We use the new embedded atom model (EAM) potential presented by Ravelo *et al.* [Ravelo *et al.*, SCCM2011 paper], developed for shock-wave simulations. We study the nucleation and evolution of dislocations and twins as a function of shock pressure and loading ramp time. We find a large dependence of the HEL (Hugoniot Elastic Limit) on strain rate. We compare the resulting dislocation densities and dislocation structures to existing experimental results on recovered samples.

[1]This research is funded by the ANPCyT project PICT2008-1325 and 06/M035 from SecTyP-U.N. Cuyo.

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Date submitted: 22 Feb 2013 Electronic form version 1.4