Abstract Submitted for the SHOCK13 Meeting of The American Physical Society

Orientation-dependent response of nanovoids in Tantalum¹ DIEGO TRAMONTINA, Instituto de Ciencias Basicas, Universidad Nacional de Cuyo, Mendoza, M5502JMA Argentina, CARLOS RUESTES, Department of Mechanical and Aerospace Engineering, University of California, San Diego, La Jolla, CA 92093, USA, YIZHE TANG, Johns Hopkins University, Baltimore, MD 21212, USA, EDUARDO BRINGA, Consejo Nacional de Investigaciones Cientificas y Tecnicas. CABA. C1033AAJ Argentina — Defective BCC Tantalum monocrystals are expected to display a particularly rich behavior when stressed along different directions. Using molecular dynamics simulations, we model Ta monocrystals containing a single spherical void of different sizes, under uniaxial compression, for two different empirical potentials. Differences on the yield point, dislocation generation and plastic heating are observed depending on the void size and stress direction, as distinct slip systems are activated, resulting in a variety of dislocation structures and mobilities. We calculate plastic heating and dislocation densities, and compare results for different interatomic potentials.

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

Diego Tramontina Instituto de Ciencias Basicas, Universidad Nacional de Cuyo, Mendoza, M5502JMA Argentina

Date submitted: 21 Feb 2013

Electronic form version 1.4