Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

Modeling Dynamic Ductility: An Equation of State for Porous  $Metals^1$  JEFFREY COLVIN, UC/Lawrence Livermore National Laboratory — Enhanced heating from shock compression of a porous material can potentially suppress or delay cracking of the material on subsequent expansion. In this presentation we quantify the expected enhanced heating in an experiment in which a sector of a thin cylindrical shell is driven from the inside surface by SEMTEX HE (peak pressure ~21.5 GPa). We first show the derivation of an analytical equation of state (EOS) for porous metals, then discuss the coupling of this EOS with material elastic-plastic response in a 2D hydrocode, and then discuss the modeling of the HE experiment with both fully dense and 10% porous Ta and a Bi/Ta composite. Finally, we compare our modeling with some recent experimental data.

<sup>1</sup>This work was conducted under the auspices of the U.S. Department of Energy by the University of California Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

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Date submitted: 23 Feb 2007

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