Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Shock compression of Cu/Nb nanolaminates and coarse-grained pure Cu and Nb W.Z. HAN, N.A. MARA, A. MISRA, T.C. GERMANN, R.G. HOAGLAND, S.N. LUO, Los Alamos National Laboratory — We investigate deformation of Cu/Nb nanolaminates (synthesized via physical vapor deposition) and coarse-grained pure Cu and Nb induced by flyer plate impact. The peak pressure is about 6 GPa and the targets are soft-recovered with proper momentum traps. For the Cu/Nb nanolaminates, shock loading is applied normal or parallel to the layer interface to reveal possible anisotropy in deformation. The recovered samples are examined with transmission electron microscopy. For the shocked Cu/Nb nanolaminates, abundant deformation twins are found in the Cu layers, and only a small amount of stacking faults, in the Nb layers. For the shocked pure Cu and Nb, dislocations are widely observed besides deformation twins (in particular in Cu), and ultra-fine microstructures are induced in some regions likely due to shear localization. The shock deformation behaviors of Cu/Nb multilayers, pure Cu and Nb are compared, and possible mechanisms, discussed.

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Date submitted: 18 Feb 2011 Electronic form version 1.4