Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

High-Ti-concentration foams as laser-driven x-ray sources[1] J.D. COLVIN, Lawrence Livermore National Laboratory, F. PEREZ, J.R. PATTERSON, M.J. MAY, J. EMIG, M.M. BIENER, A. WITTSTOCK, J.H. SATCHER, S.A. GAMMON, J.F. POCO, LLNL, S. FUJIOKA, Z. ZHANG, H. NISHIMURA, Osaka Univ., K.B. FOURNIER, LLNL — Metals between Ti and Ge are used for bright x-ray sources in the 4-10 keV range when irradiated by energetic nanosecond lasers. To maximize their laser-to-x-ray conversion efficiency (CE), lower density is preferred, achieved usually with pre-exploded thin foils or very-low-density foams ($<$10 mg/cm^3). We present recent experimental results using novel foams of high Ti concentration. Previous foams were doped with less than 5 at% of Ti. We manufactured two new types of foams with density $\sim$ 5 mg/cm^3 and Ti concentrations 20 and 33 at%. They have been tested as x-ray sources in two laser facilities, OMEGA (USA) and GEKKO XII (Japan). CEs $>$5% are measured, significantly higher than previous achievements with the lower-concentration foams. We describe laser-heating dynamics simulation results and comparisons to time-resolved measurements, indicating strong differences between the several foams used.

[1]This work was performed under the auspices of the U.S. Department of Energy by LLNL under Contract No. DE-AC52-07NA27344.

J. D. Colvin
Lawrence Livermore National Laboratory

Date submitted: 03 Jul 2013 Electronic form version 1.4