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Multi-KeV X-Ray Yields From High-Z Gas Targets Fielded at the National Ignition Facility K.B. FOURNIER, M.J. MAY, J.D. COLVIN, J.O. KANE, C.A. THOMAS, M. SCHNEIDER, R. MARRS, S. COMPTON, J. MOODY, E. BOND, E. DEWALD, Lawrence Livermore National Laboratory, J.F. DAVIS, Alme & Associates — We report on the measured X-ray flux from gas-filled targets shot with 112 – 132 laser beams at the NIF. The targets were driven with up to 75 TW of laser power (350 kJ of 3ω laser energy delivered in a 5 ns modified-flat-top pulse). The targets were thin walled (25 μm), 4 mm long, 4 mm inner-diameter epoxy pipes designed to transmit X rays in the 1 – 10 keV spectral band. The pipes were filled with 1.2 atm of an Ar:Xe mixture. The emitted X-ray flux was monitored with multiple channels of the NIF facility's two X-ray-diode based DANTE instruments in the sub-keV range, as well as around 3.2 keV (Ar K-shell emission) and in the 4.0 – 6.5 keV band (Xe L-shell emission). Two-dimensional X-ray imaging (for energies $>$ 3 keV) of the targets was performed with a gated X-ray detector. The two dimensional images confirm supersonic, volumetric heating of the gas targets. Laser light scattered from the target plasma was monitored with the facility's full aperture backscatter system (FABS), and hard X rays produced by hot electrons from the target plasma were measured with the FFLEX diagnostic. We measure 15-20% laser-to-X-ray conversion efficiency for X rays with energies greater than 3.0 keV. This work performed under the auspices of the U. S. DOE by LLNL under Contract DE-AC52-07NA27344.

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