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Experiments of multi-keV x-ray production from pre-pulsed germanium foils FREDERIC GIRARD, DANIELE BABONNEAU, MICHEL PRIMOUT, JEAN-PAUL JADAUD, MICHEL NAUDY, BRUNO VILLETTE, CEA DAM Ile de France, LARRY J. SUTER, ROBERT L. KAUFFMAN, CARMEN CONSTANTIN, MIKE C. MILLER, Lawrence Livermore National Laboratory, JACOB GRUN, Naval Research Laboratory, JOHN DAVIS, Alme&Associates — Previous work with laser pre-exploded thin foils of titanium (He alpha at 4.7 keV) and copper (He alpha at 8.3 keV) showed high multi-keV x-ray conversion efficiencies. They are increased by a factor of more than 2 in comparison with solid materials and are close to gas targets. Experiments with a thin foil irradiated with 2 laser pulses (one delayed in time) lead to hot and underdense plasmas, which are efficient to produce multi-keV K-shell emission. Exploded thin foil experiments have been performed on the OMEGA laser facility at LLE (University of Rochester) to quantify the multi-keV x-ray output from germanium targets. X-ray power was measured by filtered diodes (DMX broadband spectrometer), which was fit to the germanium K-shell emission around 10.3 keV. Within the spectral bandwidth of $10 < h\nu < 13$ keV, a conversion efficiency enhancement by a factor of 2.2 is measured relative to the case without pre-pulse.

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