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Measurements of Laser Generated X-ray Spectra from Irradiated Gold Foils[1] JOSHUA DAVIS, PAUL KEITER, PAUL DRAKE, SALLEE KLEIN, University of Michigan — Soft x-ray sources may provide a means of driving photoionization fronts in materials with a Z >2. To generate these soft x-rays at a traditional UV laser facility, a gold converter foil can be implemented that absorbs the UV photons and heats up to act as a quasi-continuum blackbody emitter with a characteristic temperature of $\sim$ 100eV. However, it takes time for the heating wave to propagate through the foil, with thicker foils having a longer delay before measureable emission is produced. Prior work has studied the emission characteristics of foil x-ray sources but was limited to laser pulses of 1ns or less. Our interest is in long duration sources (>1ns) which requires the use of thicker Au foils. To better understand how the increased foil thickness affects emission we have performed experiments at the Omega-60 laser facility studying the x-ray intensity and total emission time of 0.5, 1.0, and 2.0μm thick gold foils driven by a 2kJ, 6ns laser pulse. This presentation will discuss the results of these experiments and will include a discussion of how these results compare with theoretical predictions.

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