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A Computational Study of X-ray Emissions from High-Z X-ray Sources on the National Ignition Facility Laser[1] JEFFREY COLVIN, KEVIN FOURNIER, JAVE KANE, MARK MAY, Lawrence Livermore National Laboratory — We have begun to use 350-500 kJ of 1/3-micron laser light from the National Ignition Facility (NIF) laser to create millimeter-scale, bright multi-keV x-ray sources. In the first set of shots we achieved 15% -18% x-ray conversion efficiency into Xe M-shell (∼1.5-2.5 keV), Ar K-shell (∼3 keV) and Xe L-shell (∼4-5.5 keV) emission (Fournier *et al.*, Phys. Plasmas July 2010), in good agreement with the emission modeled using a 2D radiation-hydrodynamics code incorporating a modern Detailed Configuration Accounting atomic model in non-LTE (Colvin *et al.*, Phys. Plasmas, July 2010). In this presentation we first briefly review details of the computational model and comparisons of the simulations with the Ar/Xe NIF data. We then discuss a computational study showing sensitivity of the x-ray emission to various beam illumination details (beam configuration, pointing, peak power, pulse shape, etc.) and target parameters (size, initial density, etc.), and finally make some predictions of how the x-ray conversion efficiency expected from NIF shots scales with atomic number of the emitting plasma.

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