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Development and Characterization of a 16.3 keV X-Ray Source at the National Ignition Facility K.B. FOURNIER, M.A. BARRIOS, M.B. SCHNEIDER, S. KHAN, H. CHEN, F. COPPARI, R. RYGG, M. HOHENBERGER, F. ALBERT, J. MOODY, J. RALPH, G.E. KEMP, Lawrence Livermore National Laboratory, S.P. REGAN, Laboratory for Laser Energetics — X-ray sources at the National Ignition Facility are needed for radiography of in-flight capsules in inertial confinement fusion experiments and for diffraction studies of materials at high pressures. In the former case, we want to optimize signal to noise and signal over background ratios for the radiograph, in the latter case, we want to minimize high-energy emission from the backlighter that creates background on the diffraction data. Four interleaved shots at NIF were taken in one day, with laser irradiances on a Zr backlighter target ranging from 5 to 14 x 10^{15} W/cm^2. Two shots were for source optimization as a function of laser irradiance. X-ray fluxes were measured with the time-resolved NIF X-ray Spectrometer (NXS) and the DANTE array of calibrated, filtered diodes. Two shots were optimized to make backscatter measurements with the FABS and NBI optical power systems. The backscatter levels are investigated to look for correlation with hot electron populations inferred from high-energy x rays measured with the FFLEX broadband spectrometer. Results from all shots are presented and compared with models. Work performed under the auspices of the U.S. DOE by LLNL under Contract No. DE-AC52-07NA27344.

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