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Backlighter development for EXAFS experiments at the OMEGA Laser Facility ALEXANDRE DO, FEDERICA COPPARI, YUAN PING, ANDREW KRYGIER, GREGORY KEMP, JAMES MCNANEY, LLNL - use 19776 — Extended X-ray Absorption Fine Structure (EXAFS) allows the study of chemical bonding and local structure in solid, liquid and amorphous matter. It requires a bright and continuous x-ray source and high spectral resolution in the detection system to capture the modulations of the absorption coefficient above the material absorption edge. As an effort to improve resolution, the use of large area backlighter has been put aside in favor of slit-apertured backlighter, resulting in a reduction of the photon fluence. It is then critical to choose the brightest backlighter at our disposal. A series of experiment have been conducted at the OMEGA laser facility to characterize titanium (Z = 22), iron (Z = 26), germanium (Z = 32), molybdenum (Z = 42), silver (Z = 47) and gold (Z = 79) foil backlighter illuminated by 6 to 20 beams. The spectra have been recorded using the Dual Crystal Spectrometer (DCS), a two-channel spectrometer that covers 11 keV to 45 keV and 19 keV to 90 keV energy bands. DCS has been calibrated so that the spectral intensities could be compared between different campaigns. We present the results of this multi-campaign backlighter development study. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. LLNL-ABS-780051

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