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Experimental X-ray Spectra from Ti, V, Mn, and Ni Foils Irradiated with the Z-Beamlet Laser¹ E.C. HARDING, T. AO, J.E. BAILEY, S.B. HANSEN, M.P. DESJARLAIS, L.P. MIX, Sandia National Labs, P.D. LEPELL, Ktech Corporation, D.F. WENGER, I.C. SMITH, D.B. SINARS, Sandia National Labs, G. GREGORI, University of Oxford — We present results from our first experimental campaign aimed at investigating various x-ray spectral lines for use in future x-ray Thomson scattering experiments. The Z-Beamlet laser was used to irradiate 4 different metal foils (Ti,V,Mn, and Ni) with 10^{15} W/cm² and a total of 1 kJ at $\lambda = 527$ nm. The x-rays from the laser-heated plume were observed simultaneously at 90° and 8° (w.r.t. the surface) with two time integrating, spatially resolving spectrometers that employed spherical quartz crystals and image plate detectors. The following spectral lines were recorded with $E/\delta E \sim 1000$: Ti He- β , V He- β , Mn He- α , and Ni He- α . The relative intensities of the resonance and intercombination and satellite lines show a clear angular dependence due to opacity effects. These effects will likely be important for interrupting scattered x-ray signals. Results from a CRF foam x-ray scattering experiment will also be presented.

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