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Investigation of metallic x-ray sources at the Omega laser facility

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We report on the results of experiments carried out at the OMEGA laser to address the performances of x-ray sources made of zirconium (Zr), molybdenum (Mo), palladium (Pd), and silver (Ag) across several target and laser configurations. The Zr, Mo, and Pd sources are thin foil with thicknesses of between 2 and 3 μm, Ag sources are hollow spheres with radii of 500 μm and the thickness of the Ag deposit is 3 μm. The foils were irradiated with ~ 4-17 kJ of 3ω energy and various incident powers including pre-pulsed laser pulses. The Ag spheres were shot with ~14-27 kJ of 3ω energy. The emitted radiant powers and energies were measured in different spectral bands by the two broad-band spectrometers DMX and mini-DMX. X-ray emission from the targets was also recorded by the high-resolution spectrometer XCCS and the emissive hot plasma regions characterized by a Thomson scattering diagnostic. All these experimental results were compared and found to be in fairly good agreement with the predictions of 2D simulations performed with the radiation-hydrodynamics code TROLL [1].

<u>References</u>

[1] E. Lefebvre, *et al.*, Nuclear Fusion **59**, 032010 (2018).