Abstract Submitted
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Intense Laser-Driven Multi-MeV Photon Source for Radiography[1] JUAN FERNANDEZ, D.C. GAUTIER, Los Alamos National Lab., A. MOREAU, R. HOLLINGER, Y. WANG, H.C. WANG, J.J. ROCCA, Colorado State Univ. — Intense photon sources with energy > 1 MeV are of significant interest for flash radiography applications in research, industry and defense. Such applications include tomographic non-destructive evaluation and dynamic experiments. A small source size enables a commensurately high image resolution not limited by detector pixel size by using point-projection radiography with magnification. Generation of > 1 MeV photons by bremsstrahlung of laser-driven relativistic electrons has been investigated on the ALEPH laser at Colorado State Univ. Initial experiments with tantalum foil targets (0.5 mm thickness) have used a high-contrast laser pulse delivering a 8 – 10 J at 400 nm in 45 fs, with a peak intensity of 4×10^{21} W/cm^2. Measurements indicate a high-energy spectrum with multi-MeV average photon energy, with $> 10^{11}$ photons/sr (a dose of ≈ 0.05 Rad) delivered in a cone of ≈ 0.1 sr. The source size is very small, which has allowed us to resolve features in thick tungsten objects as small as 65 microns. Measurements in progress with more advanced targets, as well as 800 nm wavelength will also be discussed and compared to prior results with sub-ps laser pulses.

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