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Effect of laser energy and incidence angle on K-alpha and bremsstrahlung emission from thin foil targets irradiated by a short pulse, high intensity laser[1] BRADLEY WESTOVER, University of California San Diego, ANDREW MACPHEE, LLNL, TAMMY MA, FARHAT BEG, University of California San Diego, CLIFF CHEN, MIT, DANIEL HEY, BRIAN MADDOX, HYE-SOOK PARK, BRUCE REMINGTON, LLNL — We report on experiments performed to characterize a short pulse, high intensity, laser-produced x-ray source for diffraction studies. These experiments were performed using the Titan laser at the Jupiter Laser facility with a 40ps pulse length at intensities varying from 10ˆ16 to 10ˆ18 W/cmˆ2. The targets were 12 micron thick silver foils. The effects of the laser pulse energy, target angle and spot size on x-ray emission were measured using single photon counting cameras CCD cameras and bremsstrahlung spectrometers arranged upstream, downstream, and orthogonal to the laser. Integrated Tiger Series (ITS), a Monte Carlo code, was used to model the K-shell spectra and bremsstrahlung emission from the target, as well as the response of the bremsstrahlung spectrometers. Absolute k-alpha photon yields and k-alpha to bremsstrahlung ratios as a function of laser pulse energy and the angle between the laser and the target surface were determined; these data are crucial for designing picosecond x-ray diffraction experiments on Omega EP and the NIF.

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