Abstract Submitted
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Study of hot electron spatial energy deposition in spherical targets relevant to shock ignition[1] SHU ZHANG, Univ of California - San Diego, M.S. WEI, C. KRAULAND, H. REYNOLDS, M. HOPPE, General Atomics, J. PEEBLES, F.N. BEG, Univ of California - San Diego, W. THEOBALD, E. BORWICK, J. LI, C. REN, C. STOECKL, W. SEKA, R. BETTI, M. CAMPBELL, Univ of Rochester — Understanding hot electron generation and coupling is important for the high-intensity shock ignition (SI) inertial confinement fusion concept. Recent hard x-ray experimental data from a SI-relevant platform on OMEGA-60 suggest that <100 keV hot electrons may augment shock pressure by depositing their energy in the solid density region behind the ablation front [1]. These results deduced from simulation are convincing support for electron assisted SI. To further investigate beneficial hot electron characteristics from both high intensity UV and IR lasers in this relevant regime, we performed a joint OMEGA-60/OMEGA EP experiment in the spherical geometry. 60 UV laser beams (18 kJ, 1.8 ns, up to 10^{15} W/cm^2) irradiated a low-density Cu foam ball target with a CH ablator followed by a single IR short pulse laser (2.6 kJ, 100 ps, 10^{17} W/cm^2) at various delays. The electron spatial energy deposition was diagnosed via imaging Cu Kα emission with a spherical crystal imager; total Kα photon yield and bremsstrahlung radiation were also measured to infer electron spectra. Experimental results are compared with radiation hydrodynamic modeling and will be presented at the meeting. [1] W. Theobald et al., Phys. Plasmas 22, 056310 (2015).

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