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Characterizing Hot Electron Generation and Transport via Bremsstrahlung Emission on the High Intensity OMEGA EP Laser J. PEEBLES, C. MCGUFFEY, C. KRAULAND, A. SOROKOVIKOVA, B. QIAO, S. KRASHENINNIKOV, F.N. BEG, Univ of California - San Diego, M.S. WEI, R.B. STEPHENS, General Atomics, C.D. CHEN, B. WESTOVER, H.S. MCLEAN, Lawrence Livermore National Laboratory — The investigation of high intensity laser generated fast electron beams is important for a number of High Energy Density Science applications, which include proton sources and fast ignition among others. A series of experimental campaigns performed using the kilojoule, 10-ps OMEGA EP laser closely examined the impact of a preformed plasma on laser plasma interaction and electron generation. Here we present the analysis of the measured bremsstrahlung x-ray radiation and the inferred results on fast electron characteristics. Simulations, performed with the Monte-Carlo code package ITS 3.0, generate the x-ray response of the target to an injected electron beam with a given temperature, energy and divergence angle. The simulated x-rays are then compared to those collected by the bremsstrahlung spectrometers, which allows us to characterize fast electrons created in the experiment. Preliminary results show a decrease in hot electron temperature with an increase in pre-pulse, which is further corroborated by magnetic electron and Cu-Kα spectrometers. This work performed under the auspices of the US DOE under contracts DE-FOA-0000583 (FES, NNSA), DE-NA0002026 (NLUF) and DE-FC02-04ER54789 (FSC).

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