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Temperature gradient in a solid target produced by the deposition of energy by fast electrons generated in high Intensity Short Pulse Laser matter interactions[1] SOPHIA CHEN, University of California, San Diego, PRAVESH PATEL, HYUN-KUNG CHUNG, ANDREAS KEMP, SEBASTIEN LE PAPE, BRIAN MADDOX, SCOTT WILKS, Lawrence Livermore National Laboratory, FARHAT BEG, University of California, San Diego — Recently systematic studies to investigate the temperature gradient in short-pulse laser irradiated solid targets. Experiments were conducted using the Titan Laser at the intensity 3 x 10^{20} W/cm^2 (energy $\sim$ 140 J with a pulse duration of 500 fs). The 2.4 micron thick targets were composed of 0.4 micron copper tamped by silver on the front and aluminum on the back. Depth of the copper layer was changed systematically to study heating due to fast electrons. Copper K-shell emission of 8 - 10 keV was measured with a Highly Oriented Pyrolytic Graphite (HOPG) spectrometer. Diagnostics also include a single-photon counting camera to provide absolute K-shell photon yield. Results show a significant drop in He-alpha emission within 0.75 um from the front of the target, which indicates a rapid drop in temperature. Measurements are compared to Hydrodynamic, PIC and Atomic codes.

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Sophia Chen
University of California, San Diego

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