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WITHDRAWN–Kilo-Volt Heating in Very High Energy Density Experiments with Short-Pulse Laser Irradiation of Solids RICHARD SNAVELY, UC/LLNL — Ultra-intense lasers are capable of extreme energy densities. Experiments are performed to study various mechanisms of intense laser heating at the 100 TW to 1 PW levels. Heating via Wiebel instabilities, Ohmic return currents and refluxing electron electrostatic confinement by Debye sheath potentials, are studied with the technique of laser irradiated reduced mass targets. Experiments were performed at .5-10 ps and at 100 J and 400 J levels using the TAW and Petawatt beams of the Vulcan laser facility at Rutherford Appleton Laboratory. Evidence for enhanced energy density in both planar micro targets and cone-fiber configurations is presented. New diagnostics were developed: two-color XUV/soft x-ray imaging of Planck radiation, and a dual channel Highly Oriented Pyrolytic Graphite (HOPG) spectrometer in addition to the Bragg crystal imaging of Cu-K_α. Preliminary estimates indicate enhanced heating of 100 eV to kilo-Volt temperatures in high-density Cu masses. In addition, 10 um diameter cone-fiber data shows good relativistic electron transport to 1 mm lengths. Issues regarding surface versus bulk heating will be discussed. This work was performed as part of a United Kingdom university collaboration funded by the Council for the Central Laboratory of the Research Councils (CCLRC).

[X] Prefer Oral Session
[ ] Prefer Poster Session

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