Abstract Submitted
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**Laser heating of solid matter by light pressure-driven shocks at ultra-relativistic intensities** K. AKLI, General Atomics, M. KEY, A. KEMP, S. HANSEN, LLNl, R. STEPHENS, General Atomics, R. FREEMAN, OSU, F. BEG, UCSD, D. CLARK, OSU, D. HEY, S. HATCHETT, LLNL, K. HIGHBARGER, OSU, E. GIRALDEZ, General Atomic, J. GREEN, G. GREGORI, K. LANCASTER, RAL, T. MA, UCSD, A. MACKINNON, LLNL, P. NORREYS, RAL, P. PATEL, LLNL, C. STOECKL, W. THEOBALD, LLE, R. WEBER, L. VAN WOERKOM, N. PATEL, OSU, M. STORM, LLE — Heating by irradiation of a solid surface in vacuum with 5x10$^{20}$ Wcm$^{-2}$, 0.8 ps, 1.05 micron wavelength laser light is studied by x-ray spectroscopy of the K-shell emission from thin layers of Ni, Mo and V. A surface layer is heated to $\sim$5 keV with an axial temperature gradient of 0.6 $\mu$m scale length. Images of Ni Ly$\alpha$ show the hot region has a $\sim$25 $\mu$m diameter. These data are consistent with collisional particle-in-cell simulations using pre-formed plasma density profiles from hydrodynamic modeling, which show that the more than 100 *Gbar* light pressure compresses the preformed plasma and drives a shock into the solid heating a thin layer.

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