Abstract Submitted
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Isochoric heating of solid gold targets with the PW-laser-driven ion beams[1] SVEN STEINKE, QING JI, STEPAN BULANOV, Lawrence Berkeley National Laboratory, JOHN BARNARD, Lawrence Livermore National Laboratory, THOMAS SCHENKEL, ERIC ESAREY, WIM LEEMANS, Lawrence Berkeley National Laboratory — We present an end-to-end simulation for isochoric heating of solid gold targets using ion beams produced with the BELLA PW laser at LBNL: (i) 2D Particle-In-Cell (PIC) simulations are applied to study the ion source characteristics of the PW laser-target interaction at the long focal length (f/#65) beamline at laser intensities of ~$5x10^{19}$W/cm^2 at spot size of ω_0 =52 μm on a CH target. (ii) In order to transport the ion beams to an EMP-free environment, an active plasma lens [1] will be used. This was modeled by calculating the Twiss parameters of the ion beam from the appropriate transport matrixes using the source parameters obtained from the PIC simulation. Space charge effects were considered as well. (iii) Hydrodynamic simulations indicate that these ion beams can isochorically heat a 1 mm^3 gold target to the Warm Dense Matter state. Ref: [1] J. van Tilborg *et al*, Phys. Rev. Lett. **115**, 184802 (2015).

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