Abstract Submitted
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A Study of Opacity Effects in Solid-Density Ge Plasmas Created with an FEL[1] GABRIEL PEREZ CALLEJO, S.M. VINKO, S. REN, R. ROYLE, O. CIRICOSTA, O. HUMPHRIES, M.F. KASIM, J. S. WARK, University of Oxford, T.R. PRESTON, European XFEL, B.A. HAMMEL, LLNL, H.-K. CHUNG, Gwanju Institue of Science and Technology, T. BURIAN, V. VOZDA, Insitute of Physics ASCR, M.-F. LIN, T.V. DRIEL, SLAC — We have used the focussed output of the LCLS FEL to create solid-density Ge plasmas at temperatures of order 200 eV. We studied the L-shell x-ray emission from the targets as a function of their thickness. We find that the peak temperature, and the uniformity of temperature and electron density throughout the foils are strongly dependent on the photon energy of LCLS, which was varied from 1300 to 1700 eV. We compare the results with simulations from Cretin, and find that, in contrast to previous measurements on Mg plasmas [1], opacities derived from the thickness-dependent emission is heavily influenced by small residual temperature gradients across the targets. Furthermore, for these mid-Z targets the opacity itself is increased by the radiation field from the XFEL, owing to its photopumping effect on the atomic populations. [1] T. Preston et al., Phy. Rev. Lett. 119, 085001 (2017).

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