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X-ray Thomson scattering from proton heated Boron Nitride
PAUL DAVIS, University of California, Berkeley, S. LEPAPE, Lawrence Livermore National Laboratory, P. NEUMAYER, Gesellschaft fuer Schwerionenforschung (GSI), A.L. KRITCHER, T. DOEPPNER, Lawrence Livermore National Laboratory, A. BENNUZZI-MOUNAIX, A. RAVASIO, Laboratoire pour l'Utilisation des Lasers Intenses, C. BROWN, Clarendon Laboratory, Oxford, D. HOCHHAUS, Gesellschaft fuer Schwerionenforschung (GSI), C. FORTMANN, University of California, Los Angeles, G. GREGORI, Clarendon Laboratory, Oxford, O.L. LANDEN, S.H. GLENZER, Lawrence Livermore National Laboratory — We present the first measurements of proton heated Boron Nitride using x-ray Thomson scattering. The experiment was performed on the 300J, 10 ps Titan laser at Lawrence Livermore National Laboratory. The ultra-intense laser beam was split into two beams: 30% of the energy was directed onto a 10 μm Aluminum foil to generate a proton beam, and the remaining 70% was focused onto a 10 μm iron foil to generate a K-α backlighter at 6.4 keV. The proton beam isochorically heated a Boron Nitride foil, creating a solid density plasma with a temperature between 10-20 eV. X-rays were forward-scattered from the heated target onto a curved HOPG crystal, providing an accurate measurement of the temperature from the ratio of up- vs. down-shifted plasmon signals.
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