Abstract Submitted
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X-ray Thomson scattering of isochorically proton heated Boron Nitride[1] SEBASTIEN LE PAPE, Lawrence Livermore National Laboratory — We have measured for the first time the temperature of proton heated Boron Nitride using X-ray Thomson scattering. The experiment has been 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 10μm Aluminum foil to generate a proton beam, and the remaining 70% was focused onto a 10μm iron foil to generate a k-alpha backlighter at 6.4 keV. The proton beam isochorically heats a Boron Nitride foil, creating a solid density plasma with a temperature between 10-20 eV. X-rays are scattered from the heated target onto a curved HOPG crystal. X ray Thomson scattering in the collective regime provides an accurate measurement of the temperature from the ratio of up- vs. down-shifted plasmon signals. Temperature has been measured as a function of time (from 200 to 400 ps after the proton irradiation) and proton flux (by changing the intensity of the laser on the proton target).

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