Abstract Submitted
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Evolution of the Hot Spot Density and Temperature on the National Ignition Facility[1] LAN GAO, B. KRAUS, K. W. HILL, M. BITTER, P. EFTHIMION, PPPL, A. CHRISTOPHERSON, R. BETTI, C. THOMAS, LLE, M. B. SCHNEIDER, R. KAUFFMAN, D. THORN, A. G. MACPHEE, D. LIEDAHL, LLNL — The electron density and temperature and their evolution in the hot spot of a Kr-doped, big-foot implosion target were measured for the first time using an absolutely calibrated, streaked, high-resolution x-ray spectrometer named dHIRES [1] on the National Ignition Facility (NIF). The electron density was inferred through Stark-broadened line shapes and the temperature was derived from the relative intensities of dielectronic satellites to the resonance line. The data show that the hot spot density peaks after the x-ray bang time while its temperature peaks before the x-ray bang time. Such trend is compared with a 1-D calculation of the Symcap implosion using a self-similar temperature profile [2], as well as collisional-radiative calculations for line intensities and shapes [3]. [1] L. Gao *et al.*, Rev. Sci. Inst. **89**, 10F125 (2018). [2] R. Betti *et al.*, Phys. Plasmas **8**, 5257 (2001). [3] H. A. Scott, JQSRT **71**, 689–701 (2001).

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