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Using absolute x-ray spectral measurements to infer stagnation conditions in ICF implosions PRAVESH PATEL, L. R. BENEDETTI, C. CERJAN, D. S. CLARK, O. A. HURRICANE, N. IZUMI, L. C. JARROTT, S. KHAN, A. L. KRITCHER, T. MA, A. G. MACPHEE, O. LANDEN, B. K. SPEARS, P. T. SPRINGER, Lawrence Livermore National Laboratory — Measurements of the continuum x-ray spectrum emitted from the hot-spot of an ICF implosion can be used to infer a number thermodynamic properties at stagnation including temperature, pressure, and hot-spot mix. In deuterium-tritium (DT) layered implosion experiments on the National Ignition Facility (NIF) we field a number of x-ray diagnostics that provide spatial, temporal, and spectrally-resolved measurements of the radiated x-ray emission. We report on analysis of these measurements using a 1-D hot-spot model to infer thermodynamic properties at stagnation. We compare these to similar properties that can be derived from DT fusion neutron measurements. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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