

Abstract Submitted
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Sensitivity of inferred electron temperature from X-ray emission of NIF cryogenic DT implosions¹ MICHAEL KLEM, Lawrence Livermore National Laboratory, University of Dallas, T. MA, N. IZUMI, S. KHAN, A. MACKINNON, P.K. PATEL, Lawrence Livermore National Laboratory — The National Ignition Facility (NIF) at the Lawrence Livermore National Laboratory seeks to achieve thermonuclear ignition through inertial confinement fusion. The accurate assessment of the performance of each implosion experiment is a crucial step. Here we report on work to derive a reliable electron temperature for the cryogenic deuterium-tritium implosions completed on the NIF using the x-ray signal from the Ross filter diagnostic. These x-rays are dominated by bremsstrahlung emission. By fitting the x-ray signal measured through each of the individual Ross filters, the source bremsstrahlung spectrum can be backed out, and an electron temperature of the implosion hot spot inferred. Currently, each filter is weighted equally in this analysis. We present work quantifying the error bars with such a technique, and results investigating the contribution of each filter to the overall accuracy of the temperature inference. Using this research, we also compare the inferred electron temperature against other measured implosion quantities to develop a more complete understanding of the hot-spot physics.

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