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Continuum X-Ray Imaging Spectroscopy of OMEGA Direct-Drive Implosions DYLAN CLICHE, ROBERTO MANCINI, University of Nevada, Reno, REUBEN EPSTEIN, RAHUL SHAH, SEAN REGAN, IGOR IGUMENSHCHEV, Laboratory for Laser Energetics — X-ray tracer spectroscopy has proven to be a powerful diagnostic tool in inertial confinement fusion (ICF) plasmas using electron temperature dependent line ratios and electron density sensitive Stark widths. However, mid- to high-Z spectral dopants may reduce neutron yield due to radiation cooling and are incompatible with DT cryogenic ICF targets. These issues can be overcome by avoiding the use of spectral tracers and performing a spectroscopic analysis of the continuum x-ray emission from the ionized fuel. Imaging the x-ray continuum at different photon energies enables an image ratio analysis to extract a two-dimensional electron temperature map of the implosion core plasma.[1] The OMEGA multi-monochromatic x-ray imager (MMI) instrument records arrays of spectrally resolved images that can be employed for this purpose. We discuss the continuum x-ray emission from the implosion core recorded with MMI in warm-shell OMEGA implosions, the data processing and extraction of continuum narrowband images, and the comparison between experiment and simulation core electron temperature maps. This work is supported by a contract from LLE. [1]J. A. Koch, S. W. Haan and R. C. Mancini, JQSRT 88, 433 (2004)

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