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Experimental investigation of bright spots in broadband, gated x-ray images of ignition-scale implosions on NIF M.A. BARRIOS, S.P. REGAN, L. SUTER, S. GLENN, L.R. BENEDTTI, D. BRADLEY, G.W. COLLINS, R. EPSTEIN, B.A. HAMMEL, N. IZUMI, T. MA, H. SCOTT, V. SMALYUK, LLNL COLLABORATION, LLE COLLABORATION — Bright spots in the intensity profile of broadband ($h\nu > 8$ keV), gated (dt = 30-80 ps) x-ray images of implosions have been observed and are attributed to hot-spot mix [Hammel et al, Phys. Plasmas 18, 056310 (2011)]. Bright spots form when the CH ablator material doped with Ge mixes with the lower Z (T, H, D, He) hot spot plasma, enhancing the local x-ray emission. The signal level of the bright spots was quantified for THD, DT, symcap and convergent ablator implosions using Fourier analysis. The power spectral density of the x-ray intensity profile has a low wavenumber (k<0.09 m-1) portion characteristic of the envelope of the framed image used to examine implosion symmetry, and high wavenumber (0.09 m-1<k<0.63 m-1) features caused by the bright spots. The power corresponding to the high-wavenumber portion of the spectrum is compared to hot-spot mix mass inferred from Ge K-shell x-ray spectroscopy [Regan et al., aps/dpp'11]. The potential of using this technique to assess hot-spot mix for capsule shells without Ge dopant are discussed.

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