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Self-Radiography of Imploded Shells on OMEGA Based on Additive-Free Multi-Monochromatic Continuum Spectral Analysis¹ REUBEN EPSTEIN, CHRISTIAN STOECKL, RADHA BAHUKUTUMBI, TIM-OTHY J. B. COLLINS, DUC CAO, RAHUL C. SHAH, University of Rochester, DYLAN T. CLICHE, ROBERTO C. MANCINI, University of Nevada, Reno — Radiographs of pure-DT cryogenic imploding shells will help to validate progress toward ignition-scalable performance of inertial confinement fusion implosions. These can be radiographed with the core spectral emission near $hv \approx 2$ keV, based on hydrogen continuum emissivity and opacity, without spectral additives, as used in previous applications of implosion self-radiography. A demonstration of this concept of additive-free self-radiography based on continuum spectroscopy has been attempted at higher spectral energy ($hv \approx 3$ to 5 keV) with warm CH shell implosions on OMEGA. Self-backlighting is performed near peak compression, unlike externally backlit radiography, where self-emission is a background signal that overwhelms the backlighter near peak compression. This technique is also surprisingly immune to some anticipated sources of systematic error.

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