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The Third Line-of-Sight Time-Gated X-Ray Imager for OMEGA DT Cryogenic Implosions K. CHURNETSKI, W. THEOBALD, R. EJAZ, S.T. IVANCIC, A. KISH, M. MICHALKO, R.C. SHAH, R. SPIELMAN, S.P. REGAN, Laboratory for Laser Energetics, U. of Rochester, A. RAYMOND, General Atomics, P. BELL, A. CARPENTER, A. MCPHEE, C. TROSSEILLE, LLNL, J.D. HARES, A.K.L. DYMOKE-BRADSHAW, Kentech Instruments Ltd, G. ROCHAU, L. CLAUS, M. SANCHEZ, SNL, D. GARAND, Sydor Technologies — A 3-D view of the hot-spot is crucial for understanding the evolution of the hot spot and the multidimensional effects that occur during inertial confinement fusion implosions. OMEGA currently has two time-gated x-ray imagers: a time-resolved Kirkpatrick–Baez x-ray microscope [F. J. Marshall et al., Rev. Sci. Instrum. 88, 093702 (2017)] and the single-line-of-sight, time-resolved x-ray imager (SLOS-TRXI) [W. Theobald et al., Rev. Sci. Instrum. 89, 10G117 (2018)]. A time-gated hot-spot x-ray imager is being developed for use on OMEGA as a third line of sight that will follow the SLOS-TRXI concept but will have improved spatial and temporal resolutions of $\leq$5 μm and 10 ps, respectively. The diagnostic requirements and an optimized design will be presented. The self-emission from the hot spot from multiple lines of sight will be analyzed and combined to infer the electron temperature, internal pressure, and to create a low-mode reconstruction of the hot-spot region. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0003856.

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