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First Results from the LTX High-Speed Digital Holography System[1] C.E. (TOMMY) THOMAS JR., Third Dimension Technologies LLC, L.R. BAYLOR, S.K. COMBS, S.J. MEITNER, D.A. RASMUSSEN, Oak Ridge National Laboratory, E.M. GRANSTEDT, R. MAJESKI, R. KAITA, Princeton Plasma Physics Laboratory — The LTX CO_2 laser (9.1 microns) digital holography system has been operational in the lab for several months and preparations are underway for installation on LTX. The system uses a nominal 20 Watt CO2 laser and a high-speed infra-red (IR) camera to record holograms in real time with an exposure of 4 μs or less. A 92% efficient acousto-optic modulator (AOM) with pulse width control down to less than 1 μs and asynchronously pulsable at rates up to about 1 MHz provides exposure control. The FLIR SC4000 digital IR camera can acquire data at 420 fps at 320 x 256 pixels varying up to 43,000 fps at 4 x 64 pixels. Noise levels as low as 3 nm (3 x 10^{-4} fringes, or an electron density of 8x10^{11} cm^{-3} over a 10 cm path) have been observed in the laboratory, although noise levels are likely to be higher when mounted on an actual fusion experiment. First laboratory measurement results will be presented, along with any first results from operation on LTX, if available.

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C.E. (Tommy) Thomas Jr.
Third Dimension Technologies LLC

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