

Abstract Submitted  
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**Results from the LTX High-Speed Digital Holography System<sup>1</sup>** 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, D.P. LUNDBERG, C.M. JACOBSON, R. MAJESKI, R. KAITA, Princeton Plasma Physics Laboratory — A high-speed CO<sub>2</sub> laser digital holography system (500 frames per second (FPS) at 256 x 256 pixels, 1500 FPS at 128 x 128 pixels, etc., to a maximum of 43,000 FPS at 64 x 4 pixels) has been built for high-resolution imaging of electron density on the Lithium Tokamak Experiment (LTX). The laser operates at 9.1 microns by using an Oxygen-18 isotope, and has a power output up to 20 W. A FLIR SC4000 IR camera is used to capture the digital holograms. An acousto-optic modulator (AOM) is used to “shutter” the laser so that effective camera integration times down to less than one microsecond are possible. The system will be used for examining profile modifications on LTX with molecular cluster injection (MCI), supersonic gas injection (SGI), and external gas puffing. Results of measurements will be presented along with a discussion of system design, including noise-reduction techniques developed during system testing and initial operation.

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

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