

Abstract Submitted  
for the DPP12 Meeting of  
The American Physical Society

**Latest Results from the LTX High-Speed Digital Holography System**<sup>1</sup> C.E. (TOMMY) THOMAS JR., Third Dimension Technologies LLC, E.M. GRANSTEDT, C.M. JACOBSON, D.P. LUNDBERG<sup>2</sup>, R. MAJESKI, R. KAITA, Princeton Plasma Physics Laboratory, L.R. BAYLOR, S.K. COMBS, S.J. MEITNER, D.A. RASMUSSEN, Oak Ridge National Laboratory — During the last year research efforts for the LTX Digital Holography system have been concentrated on reducing noise and producing sample images. 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 imaging measurements on LTX during molecular cluster injection (MCI), supersonic gas injection (SGI), and external gas injection. Results of noise reduction efforts along with sample images and any LTX results will be presented.

<sup>1</sup>Partial Support from USDOE Contract DE-AC02-09CH11466 and USDOE Grant DE-FG02-07ER84724 is gratefully acknowledged.

<sup>2</sup>Now at Lockheed Martin

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

Date submitted: 24 Jul 2012

Electronic form version 1.4