

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

High Speed Digital Holography for Density and Fluctuation Measurements on LTX¹ C.E. (TOMMY) THOMAS JR., Third Dimension Technologies, L.R. BAYLOR, S.K. COMBS, S.J. MEITNER, D.A. RASMUSSEN, Oak Ridge National Laboratory, E.M. GRANSTEDT, R. MAJESKI, Princeton Plasma Physics Laboratory — Digital holography has been demonstrated as a viable technique for precision measurement and for measuring the development of high-speed gas flow. A digital holography demonstration system has been used on an ORNL disruption mitigation test stand to make extremely high spatial resolution (less than one mm) 2-D density measurements of gas flow. A second generation system with a high-speed infrared camera (320 x 256 pixels) and higher power 9.1 micron CO₂ laser (~20W) is being developed for electron density and fluctuation measurements on LTX. Exposures as short as one microsecond are expected and frame rates (at reduced pixel window size) of 10,000 frames per second and higher are planned. Elements of the design, components, and expected performance will be presented.

¹Partial Support from DOE SBIR Grant DE-FG02-07ER84724 is gratefully acknowledged.

C.E. Thomas Jr.
Third Dimension Technologies

Date submitted: 23 Jul 2009

Electronic form version 1.4