

Abstract Submitted  
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**Development of a Dual-Laser Digital Holography Diagnostic for Surface Characterization at ORNL**<sup>1</sup> J.C. SAWYER, The University of Tennessee, Knoxville, T.M. BIEWER, Oak Ridge National Laboratory, C.E. THOMAS, Third Dimension Technologies, Z. ZHANG, The University of Tennessee, Knoxville — The Fusion and Materials for Nuclear Systems Division (FMNSD) at Oak Ridge National Laboratory (ORNL), in collaboration with The University of Tennessee, Knoxville and Third Dimension Technologies (TDT), presents continuing progress towards the development of a dual-laser digital holography (DH) technique for 3D imaging of plasma facing component (PFC) surfaces in real time. This update includes results from an “on the bench” single-laser DH demonstration. The dual-laser approach utilizes two CO<sub>2</sub> lasers tuned to neighboring molecular CO<sub>2</sub> lines to extend the  $2\pi$  ambiguity of holographic interferograms to  $\sim 5$  mm from the  $\sim 10$   $\mu\text{m}$  wavelength. Reconstruction of the interferogram allows for measurement of changes in surface topology at rates of  $\sim 2$  mm/s. This status of a dual-laser DH system “on the bench,” demonstration and implementation on the Proto-MPEX device will be presented.

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