

Abstract Submitted
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Assessing Digital Holography for potential deployment on Proto-MPEX and DIII-D¹ E.G. LINDQUIST, University of Tennessee, T.M. BIEWER, Oak Ridge National Laboratory, C.D. SMITH, University of Tennessee, C.E. THOMAS, Third Dimension Technologies — A 3D IR digital holography diagnostic for *in situ*, real-time plasma facing component (PFC) measurements in development at Oak Ridge National Laboratory. Erosion measurements are typically *post mortem* because *in situ* diagnostics are still being developed. With ITER divertor cooling channels ~ 8 mm below the surface, the *in situ* capabilities of digital holography (DH) can provide measurements during and after discharges to inform operations when divertor erosion may breach the coolant. The benchtop system at ORNL could be put on a linear plasma device at ORNL for proof-of-principle measurements on C and W targets to quantify Proto-MPEX erosion rates and to determine DH limits of detection. Then DH could be deployed on DIII-D for a first-of-kind *in situ* measurements to demonstrate the DH technique in a fusion plasma environment. Implementation of DH would provide first *in situ* measurements and advance DIII-D PMI goals. The DIII-D divertor strike point width, $\lambda_{q_{\parallel}}$ is calculated to be 1-2 mm and DH can monitor ~ 1 cm² region. Hence, DH will be able to measure the net erosion profile at and around the strike point. This poster will present an assessment of the requirements for staging the DH diagnostic on the Proto-MPEX linear device and subsequently on the DIII-D tokamak.

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