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Categorization of Surface Damage by Laser Ablation to Material Targets as a Proxy for Plasma Exposure Erosion Using Digital Holography¹ ALEXANDER GREENHALGH, University of Tennessee Knoxville, THEODORE BIEWER, Oak Ridge National Laboratory, ELIZABETH LINDQUIST, University of Tennessee Knoxville, CLARENCE THOMAS, Third Dimension Technologies, CARY SMITH, University of Tennessee Knoxville — In situ measurements of the accumulating erosion or damage on Plasma Facing Components (PFCs)- essential to the development of a viable magnetic fusion device-are not possible with conventional techniques. Using Laser Induced Breakdown Spectroscopy (LIBS) laser and Digital Holography (DH) under development at Oak Ridge National Lab, it is possible to use LIBS to simulate plasma-eroded samples, and to measure the damage with DH. The LIBS system has been used for sample preparation to create craters of various sizes in material targets by varying the energy of each laser pulse and the number of pulses. Target measurements were obtained by both confocal microscopy and DH. A categorization of the ablation damage derived from the tests will be shown. This categorization will provide guidance for future experiments with the eventual goal of making in situ DH measurements of PFC surface erosion.

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