Abstract Submitted
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Statistical characterization of surface features from tungsten-coated divertor inserts in the DIII-D Metal Rings Campaign[1] JACOB ADAMS, Virginia Tech , EZEKIAL UNTERBERG, Oak Ridge National Lab, CHRISTOPHER CHROBAK, BRIAN STAHL, TYLER ABRAMS, General Atomics — Continuing analysis of tungsten-coated inserts from the recent DIII-D Metal Rings Campaign utilizes a statistical approach to study carbon migration and deposition on W surfaces and to characterize the pre- versus post-exposure surface morphology. A TZM base was coated with W using both CVD and PVD and allowed for comparison between the two coating methods. The W inserts were positioned in the lower DIII-D divertor in both the upper (shelf) region and lower (floor) region and subjected to multiple plasma shots, primarily in H-mode. Currently, the post-exposure W inserts are being characterized using SEM/EDX to qualify the surface morphology and to quantify the surface chemical composition. In addition, profilometry is being used to measure the surface roughness of the inserts both before and after plasma exposure. Preliminary results suggest a correlation between the pre-exposure surface roughness and the level of carbon deposited on the surface. Furthermore, ongoing in-depth analysis may reveal insights into the formation mechanism of nanoscale bumps found in the carbon-rich regions of the W surfaces that have not yet been explained.

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