Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Temperature Effects on Relief Pressure of Helium Bubbles in Tungsten[1] BRANDON F. LEE, KARL D. HAMMOND, Univ of Missouri - Columbia — Tungsten, the current material of choice for tokamak divertors, is known to develop a network of tendrils, dubbed "fuzz," when exposed to helium plasma. The formation of helium bubbles below the surface is an important part of the process of fuzz formation. This study utilizes molecular dynamics to analyze the effects of temperature on the pressure at which dislocation loop-punching and/or helium bubble bursting occurs. As expected, raising the temperature lowers the pressure at which bubbles of a given size at a given depth from the surface will burst or loop-punch, but the magnitude of the change decreases as the temperature increases. The relief pressure also falls off near the surface: the relief pressure at all tested temperatures is generally well-described by an empirical equation of the form $P_r = P_b(1 - e^{-Cd})$, where P_r is the relief pressure, P_b is the bulk loop-punching pressure at the same temperature, d is the depth of the bubble, and C is a constant to be determined.

[1]This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Fusion Energy Sciences and Office of Advanced Scientific Computing Research through the Scientific Discovery through Advanced Computing (SciDAC) project on Plasma-Surface Interactions.

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Date submitted: 23 Jun 2020 Electronic form version 1.4