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Calculations of Helium Bubble Evolution in the PISCES Experiments with Cluster Dynamics SOPHIE BLONDEL, TIMOTHY YOUNKIN, BRIAN WIRTH, University of Tennessee, ANE LASA, DAVID GREEN, JOHN CANIK, Oak Ridge National Laboratory, JON DROBNY, DAVIDE CURRELI, University of Illinois at UrbanaChampaign — Plasma surface interactions in fusion tokamak reactors involve an inherently multiscale, highly non-equilibrium set of phenomena, for which current models are inadequate to predict the divertor response to and feedback on the plasma. In this presentation, we describe the latest code developments of Xolotl, a spatially-dependent reaction diffusion cluster dynamics code to simulate the divertor surface response to fusion-relevant plasma exposure. Xolotl is part of a code-coupling effort to model both plasma and material simultaneously; the first benchmark for this effort is the series of PISCES linear device experiments. We will discuss the processes leading to surface morphology changes, which further affect erosion, as well as how Xolotl has been updated in order to communicate with other codes. Furthermore, we will show results of the sub-surface evolution of helium bubbles in tungsten as well as the material surface displacement under these conditions.

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