

Abstract Submitted
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Kinetic treatment of plasma-material interactions utilizing dynamically-coupled Boltzmann plasma and surface erosion model
SHANE KENILEY, DAVIDE CURRELI, Univ of Illinois - Urbana — We present a numerical characterization of plasma-surface interaction by using a multi-species full-f Boltzmann plasma description coupled to a Binary Collision Approximation (BCA) model, Fractal-TRIDYN. The method couples a continuum Boltzmann-Poisson solver of a multi-species plasma to an improved version of the TRIDYN code including dynamic surface composition. The BCA module provides on-the-fly boundary conditions for a complete description of the dynamic feedback between the near-wall plasma and the material surface. Kernel density estimates are utilized to reconstruct continuous distributions from the discrete data predicted by the BCA model. Phenomena such as material sputtering, backscattering, and implantation, and their effect on the structure of the near-wall plasma, are dynamically accounted for in both mono-component and multi-component targets.

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