

Abstract Submitted  
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**Boltzmann-BCA Analysis on the Role of Charge Exchange in Microscopic Erosion of Fusion-Relevant Plasma Facing Components**<sup>1</sup> SHANE KENILEY, University of Illinois at Urbana-Illinois, DAVIDE CURRELI, University of Illinois at Urbana-Champaign — Charge-exchange is expected to play an important role in microscopic erosion of plasma facing components under fusion-relevant conditions. In this work we present a set of detailed Boltzmann simulations of the near-wall plasma including surface response, with the goal of highlighting the relative role of charge exchange against ion-induced erosion. The simulations reveal that the charge-exchange processes occurring in the collisional presheath release energetic neutrals toward the wall with angular distributions ranging from grazing to normal incidence; the ions accelerated across the collisional and magnetic presheath acts as a dominant factor in affecting the initial phase of the neutral population reaching the wall, and ultimately its energy-angle distribution at the surface. The effect on erosion rates, plasma sheath/presheath structure, and moments of the distributions are highlighted. The study has been made possible thanks to a newly-developed dynamically-coupled Boltzmann-BCA model retaining the effects of both the plasma and the material erosion.

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Shane Keniley  
University of Illinois at Urbana-Illinois

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