

Abstract Submitted
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Simulation of ion-acoustic waves and their effect on collisions in an ion presheath.¹ LUCAS BEVING, SCOTT BAALRUD, University of Iowa, MATTHEW HOPKINS, Sandia National Laboratories, BRETT SCHEINER, University of Iowa — It has been predicted that the ion flow in an ion presheath can excite ion-acoustic waves [1]. However, no direct measurement or simulation has yet been made. If these waves are excited, then previous work predicts that wave-particle interactions would significantly enhance the effective coulomb collision rate [1]. Increased collisionality could explain why ion and electron velocity distribution functions are measured with varying degrees of thermalization near the presheath-sheath boundary [2]. PIC simulations will be used to calculate the power spectrum of density fluctuations to determine if the ion-acoustic waves are driven unstable. The simulations also allow for the quantification of wave-particle effects by calculating time correlations between the distribution fluctuations and the electric-field fluctuations $\langle \delta f \delta E \rangle$. Additionally, the neutral pressure will be varied to turn the instability on or off due to ion-neutral damping. [1] Baalrud S D and Hegna C C 2011 *Plasma Sources Sci. Technol.* **20** 025013 [2] Yip C, Hershkowitz N and Severn G 2015 *Plasma Sources Sci. Technol.* **24** 015018

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