**Kinetic Particle-In-Cell Simulations Of The Presheath With A Magnetic Field And Collisions** OLWEN S. CETINER, MALCOLM G. HAINES, Imperial College, London — A kinetic particle-in-cell code is developed to study the presheath and sheath accounting for velocity dependent collisions of the electrons and ions with neutral Hydrogen and an oblique magnetic field. By comparing the results with simulations of a collisionless plasma with and without an oblique magnetic field, the trends associated with collisions are identified. A particle source, due to ionization, is located in a single cell to differentiate its role. It is demonstrated that the magnitude of the wall normal flow velocity through the system displays a dependence on the ability of the source to accelerate the ions. The variation in the electrostatic potential drops of the different models illustrates a dependence of the magnitude on the difference between the electron and ion particle velocities as they traverse to the surface. These properties result in relatively low values of the electrostatic potential across the presheath and Debye sheath and wall normal flow velocity when a magnetic field at grazing incidence to the surface and collisions are accounted for.

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