

Abstract

The plasma sheath plays an important role in determining overall plasma properties as well as particles and energies reaching the wall. We have developed a self-consistent 1d3v (one dimension in space and three dimension in velocity) kinetic model, which can be used for modeling various situations of interest. Exact ion trajectories are followed, to calculate along them the ion distribution function, assuming an arbitrary injection ion distribution. The electrons, on the other hand, are assumed to have a cut-off Maxwellian velocity distribution at injection and their density distribution is obtained analytically. Starting from an initial guess, the potential profile is iterated towards the final time-independent self-consistent state. The plasma-wall transition region in presence of oblique magnetic fields has been studied using the model. In presence of an oblique magnetic field plasma-wall transition region, which otherwise is purely electrostatic, breaks in two regions: magnetic presheath (dependent on magnetic field) and electrostatic Debye sheath (independent of the magnetic field). Also, kinetic energy of ion reaching the material wall and sheath thickness can be controlled by applied magnetic field and its orientation. The KTS model and its results will be presented. In addition, other plasma activities in Nepal with special emphasis on basic plasma experiments will also be discussed.