

Abstract

In this thesis, we performed calculations of spacecraft charging in which we examined that in spacecraft charging, ion's temperature cannot be neglected and strong magnetic field is present. By using the current balance equation, we obtained the threshold condition of spacecraft charging that depends only on the critical temperature of electrons and properties of surface material. Similarly, by using velocity distribution of ions, we obtained ion and electron current density and electric potential of spacecraft. Assuming Bohm criterion of ions in which velocity must be greater than the acoustic velocity, effect of ion's temperature and $\mathbf{E} \times \mathbf{B}$ drift, we obtained modified form of Bohm criterion.