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Structures induced by external magnetic field in discharge plasma.[1] IRINA SCHWEIGERT, MICHAEL KEIDAR, The George Washington University, THE GEORGE WASHINGTON UNIVERSITY TEAM — Recently some methods to control the Hall effect thruster characteristics with applying the oblique magnetic field with respect to the channel walls are widely discussed. Nevertheless with increasing the inclination of the magnetic field, discharge plasma properties can essentially change. In this work, in kinetic simulations we consider the dc discharge plasma in the external oblique magnetic field at pressure, P=0.1 mTorr. Our purpose is to study the plasma structure modification with changing the electron temperature, magnetic field strength and obliqueness for the conditions similar to the Hall thruster ones. The plasma is embedded in a cylindrical chamber an confined by the magnetic field of 25-100 G. To describe the plasma in electromagnetic field at low gas pressure we solve Boltzmann equations for the distribution functions for electrons and ions with 2D3V particle-in cell Monte Carlo collision method. The Poisson equation was solved to find the electrical potential and electrical field distributions. The periodical structure with ridges of ion and electron densities was found for larger obliqueness of magnetic field. The electron and ion ridges are shifted with respect to each other and double–layer structure appears across B-field and along the potential rise.

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