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STUDY OF DENSITY JUMP PHENOMENON UNDER THE EFFECT OF CIRCUIT LOSS IN A
HELICON PLASMA THRUSTER

Abstract

A modified energy and particle balance model is developed to study the density jump phenomenon in helicon plasma thruster, the model considers wall sheath effects, plasma ionization and combination loss and generation mechanisms, ion ambipolar flow and etc. helicon power absorption is calculated from the combination of Helicon-TG wave energies. The results show a close relationship between density jump and circuit loss, which predicts a combination of different resonance modes to form a sharp increase(density jump) under certain radiofrequency power and circuit loss values.