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Effect of transverse magnetic field on the steady state properties of Plasma Diodes SOURAV PRAMANIK, Saha Institute of Nuclear Physics, Kolkata, VICTOR KUZNETSOV, Ioffe Institute, Russia, NIKHIL CHAKRABARTI, Saha Institute of Nuclear Physics, Kolkata — A study of the steady-states of the Plasma Diodes (e.g., Bursian diode, Pierce diode etc.) driven by a cold electron beam is presented in presence of an external transverse magnetic field is presented. Both the regimes of no electron-reflection and electron-reflection are taken into account. Steady state solutions are evaluated using emitter electric field as a characteristic parameters, for fixed values of the diode length, applied voltage, and magnetic field strength. For our purpose, both the Eulerian and Lagrangian descriptions are employed. It is shown that transverse magnetic field has profound influences on the space charge limit, maximum diode current, aperiodic instability and other characteristic parameters. An external magnetic field can be used to design fast electronic switches based on its effects on the Plasma diode.

Sourav Pramanik
Saha Institute of Nuclear Physics, Kolkata

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