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Effect of magnetic field on Langmuir probe measurements JEROME BREDIN, PASCALINE GRONDEIN, PASCAL CHABERT, Laboratoire de Physique des Plasmas, VALERY GODYAK, RF Plasma Consulting, ANE AANESLAND, Laboratoire de Physique des Plasmas — In the context of PEGASES thruster where an ion-ion plasma is formed across a localized magnetic field, a study to understand how magnetic field affects the Langmuir probe measurements has been made. Several theoretical works have predict that the plasma anisotropy created by a magnetic field will influence Langmuir probe measurement as a function of the orientation of the probe tip. The study has been made in an electropositive plasma of argon for a uniform magnetic field to avoid effects of magnetic field gradient. The electron energy distribution functions (EEDF) measured with various magnetic field show that the measurements with the probe tip along the magnetic field are depleted in the low energy range compared to the one perpendicular to the magnetic field. Comparison of the results obtained with different magnetic field and different probe orientations allows for evaluation the effect of magnetic field on accuracy of EEDF measurement in plasma with magnetic field. These results confirm the theory on Langmuir probes in magnetized plasma that predict a depletion of low electron energy for measurements along the magnetic field lines.

> Jerome Bredin Laboratoire de Physique des Plasmas

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