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Experimental study of charged particle transport in a magnetized low-temperature plasma[1] R. BAUDE, F. GABORIAU, G.J.M. HAGELAAR, LAPLACE, University de Toulouse, France — Magnetized low-temperature plasmas are widely used in different types of applications: materials processing, space propulsion, or neutral beam injection. However, the role of the magnetic field in these plasmas is not fully understood, in particular when the plasma chamber has no cylindrical symmetry. The magnetic drift is then bounded by the walls and can play an important role in the plasma transport. In this work, an experimental set up has been developed to study electron transport across a magnetic field barrier and obtain experimental data for the validation of magnetized plasma models, in conditions similar to those of negative ion sources for neutral beam injection. In order to experimentally characterize the electron transport, the local ion and electron current densities at the walls are measured. The diagnostic used is a wall current probe similar to a segmented planar probe designed and developed to spatially and temporally measure the ion and electron current density. The experimental current density profiles are compared with current density profiles calculated with a 2D fluid model.

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