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EEDF and Plasma Parameters of ICP in Dipole Magnetic Trap

VALERY GODYAK, RF PLasma Consulting — Electrical and plasma parameters were measured in an ICP excited with an immersed cylindrical antenna coil having a permanent magnet at its axis. The magnetic field structure formed a dipole magnetic trap leading to a strong stratification of the ICP into two zones. One, the hot plasma zone, that was localized near the antenna and consisting of dense plasma with large electron temperature (comparing to those in the same ICP without magnetic field). The other, cold plasma zone surrounding the first one, consisted of cold electron having there temperature much smaller than without magnetic field. The temperature reduction in this zone was result of magnetic filer effect leading to trapping of high energy electrons within the hot zone. Found a strong spatial non-uniformity in the EEDF and in plasma macro parameters was explained with magnetic filter effect at the condition of braking of electron kinetics non-locality in the presence of magnetic field.

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