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Integral Electrical Characteristics and Local Plasma Parameters of an RF Ion Thruster

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Comprehensive diagnostics has been carried out for an RF ion thruster (RIT) based on inductively coupled plasma (ICP) with an external flat antenna coil enhanced with ferrite core. The ICP was confined within a cylindrical chamber with low aspect ratio to minimize plasma loss to the chamber wall. Integral diagnostics of the ICP electrical parameters (RF power and coil current) allowed for evaluation of the antenna coil, matching network, and eddy currents loss and the true RF power deposited to plasma. Spatially resolved electron energy distribution function (EEDF), plasma density, electron temperature, and plasma potentials were measured with movable single Langmuir probes.