

Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Propagation and absorption of electromagnetic waves in the magnetospheric plasma device RT-1 TAKAHIRO MORI, The University of Tokyo, MASAKI NISHIURA, NAOKI KENMOCHI, NIFS, KENJI UEDA, The University of Tokyo, SHIN KUBO, NIFS — A dipole field is a basic structure in nature for plasma confinement. The Ring Trap 1 (RT-1) device is motivated by the Jovian magnetosphere, and it enables us to study both magnetospheric plasma physics and advanced fusion. The RT-1 device has demonstrated the plasma confinement in a dipole field produced by a levitated superconducting ring magnet. The produced plasma has a peaked density profile invoked by the self-organization, which is a unique feature in a dipole field configuration like a magnetosphere in nature. To evaluate the absorption of the electron cyclotron (EC) wave, the modulated EC wave is applied to the RT-1 plasmas, and the response of the diamagnetic signal is measured. The dependence of the absorption efficiency on the density is characterized experimentally. As the density increases, the absorption efficiency decreases and the upper limit of the density appears. The understanding of the propagation and the absorption profile of EC waves in a dipole field is necessary to explain the above experimental results. We applied the full wave simulation for the propagation of EC waves. The absorption is modeled by a hot dispersion relation. The results will be presented and discussed.

Takahiro Mori
The University of Tokyo

Date submitted: 29 Jun 2020

Electronic form version 1.4