

Abstract Submitted
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Wave Heating in Ion Cyclotron Ranges of Frequencies in RT-

1¹ M. NISHIURA, Z. YOSHIDA, Y. YANO, Y. KAWAZURA, T. MUSHIAKE, H. SAITOH, M. YAMASAKI, A. KASHYAP, N. TAKAHASHI, M. NAKATSUKA, The University of Tokyo, A. FUKUYAMA, Kyoto University — The magnetosphere plasma device RT-1 has been developed for the studies on magnetosphere and advanced fusion plasmas. A levitated superconducting coil produces magnetic dipole fields that realize a high confinement state. The electron cyclotron resonance heating (ECRH) with 8.2 GHz and 50 kW produces the plasmas with hot electrons in a few ten keV range. We reported that the local electron beta exceeded 1 in RT-1 plasmas. In such situation, the ions still remain cold at a few ten eV. Heating ions is expected to access high ion beta state and to improve the plasma confinement theoretically. Therefore the ion cyclotron range of frequencies (ICRF) heating with 2-4 MHz and 10 kW is being prepared in RT-1. Based on the results of the TASK-WF2 code, the \square shape loop antenna was designed for a slow wave excitation, and was implemented in the RT-1. In the ICRF heating experiments, a base plasma was sustained by ECRH. We observed the clear increase in diamagnetic signals and impurity ion temperature (CIII) in helium plasmas at the neutral gas pressure of 3 mPa, if the ICRF power of 10 kW is comparable to the ECRH one. This result is the first time in a magnetosphere plasma device. The results related to the ICRF heating will be presented in detail.

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M. Nishiura
The University of Tokyo

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