DPP07-2007-001047

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Sorting Category: 1.4.0 (E)

Improved Plasma Properties in RT-1 with a Levitated Coil HARUHIKO SAITOH, ZENSHO YOSHIDA, YUICHI OGAWA, JUNJI MORIKAWA, SHO WATANABE, YOSHIHISA YANO, JUNKO SUZUKI, The University of Tokyo — Ring Trap-1 (RT-1) is a novel device to confine plasmas in a magnetosphere-like configuration generated by a superconducting internal conductor. The ring coil is excited with a permanent current of I_c=250kAT that is magnetically levitated in the chamber to minimize disturbances to the plasmas. The main scientific objective of RT-1 is to realize self-organized states of flowing plasmas with a very high beta value, where the thermal pressure of plasmas is balanced by the hydrodynamic pressure of a fast flow (S. M. Mahajan & Z. Yoshida, PRL **81**, 4863 (1998), Z. Yoshida & S. M. Mahajan, PRL **88**, 095001 (2002)). We have started a series of initial plasma experiments since 2006, and in this study, we focused on the improvements of plasma properties by the coil levitation. Hydrogen plasmas were generated by an 8.2GHz ECH system. When the coil was levitated, a line integrated electron density increased to n_e=4x10^{17}m^{-2} and the peak density was close to the O-mode cut off density of the microwave. The beta value of the plasma was $\sim$3% and the pressure was mainly sustained by a high energy component of electrons. The magnetic surface configuration of RT-1 is also suitable for the confinement of non-neutral plasmas. Experiments on electron plasmas were conducted in RT-1 expanding the previous work in a normal conducting device.

Haruhiko Saitoh
saito@ppl.k.u-tokyo.ac.jp
The University of Tokyo

☐ Prefer Oral Session
☒ Prefer Poster Session

Date submitted: 20 Jul 2007 Electronic form version 1.4