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Spatial Structures and Temporal Evolutions of High-Beta Plasma in RT-1 YOSHIHISA YANO, ZENSHO YOSHIDA, JUNJI MORIKAWA, HARUHIKO SAITOH, MASAYA KOBAYASHI, YOSUKE KAWAI, Graduate School of Frontier Sciences, Univ. of Tokyo — The Ring Trap-1 (RT-1) device can sustain an ultra high beta plasma in the artificial magnetosphere which is realized by the superconducting magnet levitated in the vacuum chamber. By optimizing the operation conditions, we have achieved the confinement of the high beta plasma whose diamagnetic signal is 4.0 mWb, which we estimate that the maximum local beta value exceeds 70%. In order to improve the estimate accuracy of the plasma pressure and to evaluate the temporal evolution of the pressure profiles, we have developed a fast Hall probe array in RT-1. In contrast to the existing magnetic measurement located outside the magnetic separatrix on the equatorial plane, the new system is installed from a bottom port of RT-1, close to the plasma boundary, is more sensitive to the pressure of the plasma near the dipole coil. We have observed not only an equilibrium structures of a stably generated plasma but also the time evolution of the pressure profile during the events which involve a change of the confined energy such as the “afterglow” or a mode transition.

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