Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Measurement of the negative hydrogen ions temperature by using an omegatron mass analyzer in the sheet plasma TOSHIKIO TAKIMOTO, TAKAAKI IIJIMA, YUTA TANAKA, TAKUYA HASE, AKIRA TONEGAWA, Tokai University, KOHNOSUKE SATO, Chubu Electric Power Co.lnc., KAZUTAKA KAWAMURA, Tokai University — The production mechanisms of negative ions in hydrogen plasma are not easily understood because of the complex phenomena of atomic and molecular reactions. A mainstream measurement of H^- is a laser photodetachment technique. We had measured negative ions using a laser photodetachment technique. Consequently, under a secondary hydrogen gas supply entering into the plasma, the H^- is distributed in the periphery of the sheet plasma. In addition, it has been reported that the negative hydrogen ions transport velocity evaluated by the relaxation time of optically released electron current. Nevertheless, this technique a laser photodetachment cannot be used as a mass analyzer. In this paper, we have measured the temperature of the negative hydrogen ions T_{H-} by using an omegatron mass analyzer in the sheet plasma. The T_{H-} is determined by measuring the collection ion currents I_{H-} as a function of the ion repeller voltage V_{G2} by using an omegatron mass analyzer. From the fitting an exponential region of the measured I-V characteristics curve, T_{H-} is around 1.40 eV at the gas pressure of 0.23 Pa in the periphery region of the sheet plasma.

Toshikio Takimoto
Tokai University

Date submitted: 19 Jun 2015 Electronic form version 1.4