Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

**Novel Electromagnetic Propulsion System Using High-Density Helicon Plasma**[1] TAISEI MOTOMURA, EIJI OHNO, HIROTSUGU KATANAMI, YOSUKE SAKEI, TAKAHIRO YASUTAKE, JUNICHIRO MORI, SHUNJIRO SHINOHARA, TOHRU HADA, IGSES, Kyushu University — We have been conducting an experimental study on advanced electromagnetic propulsion system using high-density plasma, applying the helicon waves for efficient plasma production and the rotating magnetic field (RMF) for plasma acceleration via Lorentz force induced by a nonlinear azimuthal current [1,2]. Since the proposed scheme is completely electrodeless, the issue of electrodes erosion is absent, hence a very long operation lifetime can be expected. Using the Large Mirror Device (LMD) installed at Kyushu University [3], the electron density and the ion flow velocity are measured by Langmuir and Mach probes, respectively, with and without applying the RMF. The penetration conditions of the RMF into the plasma are estimated by using the magnetic probe. The initial results will be presented in detail.

[1] M. Inomoto, IEEJ Trans. FM. **128**, 319 (2008).
[2] I. R. Jones, *et al.*, J. Plasma Phys. **26**, 441 (1981).
[3] S. Shinohara, *et al.*, Jpn. J. Appl. Phys. **35**, 4503 (1996).

[1]Work supported by Grant-in-Aid for Scientific Research, and JSPS Fellow, Japan.

Taisei Motomura
IGSES, Kyushu University

Date submitted: 16 Jul 2010 Electronic form version 1.4