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Electrodeless RF Plasma Propulsion by Rotating Magnetic Field Method TAKERKU FURUKAWA, KOHEI TAKIZAWA, DAISUKE KUWAHARA, SHUNJIRO SHINOHARA, Tokyo Univ of Agri Tech — Electric propulsion scheme is promising in the field of the space propulsion because of high fuel efficiency and long operating time. However, this time is limited due to the loss of electrodes contacting with plasmas directly. In order to solve this problem, we have proposed electrodeless acceleration schemes [1], e.g., a rotating magnetic field (RMF [2]) scheme [1,3]. In this RMF scheme, we use two pairs of 5 turns RMF coils with AC currents, which have a 90 deg. phase difference. The rotating magnetic field induces azimuthal current j by a nonlinear effect. Then, plasma is accelerated by the axial Lorentz force using the product of j and the radial component of external magnetic field. We have investigated the effect of the RMF current frequency f, and 24 % increase of ion velocity in the case of $f = 3$ MHz. We will present the experimental results, using lower f and gas pressure, and also discuss the penetration of RMF into the plasma. [1] S. Shinohara *et al.*, *IEEE Trans. on Plasma Sci.* **42** (2014) 1245. [2] I. R. Jones, *Phys. Plasmas* **6** (1990) 1950. [3] S. Otsuka *et al.*, Plasma Fusion Res. **10** (2015) 3401026.

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