Abstract Submitted
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2D Spatial Profiles of Ion Velocity Distribution Functions in Rotating Magnetic Field Plasma Acceleration Method[1] TAKERKU FURUKAWA, Tokyo Univ of Agri Tech, DAISUKE KUWAHARA, Chubu Univ, SHUNJIRO SHINOHARA, Tokyo Univ of Agri Tech — Electrodeless rf (radio frequency) plasma propulsion system is a promising way to overcome degradation of thrust performance and limitation of its operational life time because of erosion of the electrodes (grids), which can be seen in conventional electric propulsion systems such as ion gridded engine and Hall thruster. Rotating Magnetic Field (RMF) plasma acceleration method [1,2] is one of the electrodeless concepts and is expected to enhance performance by means of additional plasma acceleration [1], i.e., electromagnetic force. This RMF method drives an azimuthal electron current owing to Hall-term effect, and the additional force is generated in the presence of the external divergent magnetic field. To demonstrate our proposed RMF thruster concept, two-dimensional spatial profiles of ion velocity distribution functions were measured by using Laser Induced Fluorescence (LIF) method [3]. In this conference, these spatial profiles will be reported, showing the RMF plasma acceleration effect in comparison to the profiles without the RMF application. [1] S. Shinohara et al, IEEE Trans. on Plasma Sci. Vol. 42 (2014) 1245. [2] T. Furukawa et al, Phys. Plasmas, Vol.24 (2017) 043505, Vol.26 (2019) 033505, AIP Adv., Vol.7 (2017) 115204, and Rev. Sci. Instrum., Vol.89 (2018) 043505. [3] Y. Tanida et al, T. Jpn. Soc. Aeronaut. S., Vol.14 (2016) Pb7.

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