

Abstract Submitted
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Effect of applied magnetic nozzle on an MPD Thruster AKIRA ANDO, YUKI IZAWA, KOHEI OKAWA, YOKO HASHIMA, HIROSHI WATANABE, NOZOMI TANAKA, Grad. School of Engineering, Tohoku Univ. — Electric propulsion systems are suitable for long-term mission in space due to its higher specific impulse. An Magneto-Plasma-Dynamic Thruster (MPDT) is one of the promising thrusters of high power electric propulsion systems. It has been reported that the thrust performance of an MPDT can be improved by applying an axial magnetic field on it. In order to investigate the effect of applied field on an MPDT, we have investigated plume plasma parameters and thrust performance in an applied field MPDT. Different types of divergent magnetic nozzle were applied to an MPDT, and thrust was measured using a pendulum type thrust target. Experiments were performed with hydrogen, helium, and argon as propellant gas. Thrust increased with a discharge current up to 6kA and applied magnetic field up to 0.4T. Maximum thrust of 7N was obtained when the peak position of the applied magnetic field was set upstream of the muzzle of the MPDT. The highest thrust performance was obtained with hydrogen gas with divergent magnetic nozzle applied to the MPDT.

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