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Thrust measurement of an electro-magnetic thruster applying a pseudo-spark discharge MASAYUKI WATANABE, HAYATA MAEBARA, TORU FUKATA, HIKARU NAKAMURA, ATSURI MIYAUCHI, TAKAHARU KAMADA, Nihon University — An electro-magnetic thruster is one of thrust systems for outer space. The plasma accelerated and ejected by the Lorentz force becomes the thrust of the spacecraft. In general, the electro-magnetic thruster has a high thrust and wide range of specific impulse. However, it has not been put to practical use yet because the electrode durability is low performance due to a high current arc discharge. To realize the electro-magnetic thruster with the high electrode durability, the electric thruster which is applied a pseud-spark discharge (PSD) to the plasma generation part, has been developed. The electrode damage is expected to decrease because the PSD is a high current glow discharge rather than arc mode. In this presentation, some performance evaluations of the electro-magnetic thruster applying a PSD will be reported. The electron temperature and density are approximately 5 eV and on the order of 10^{20} m^{-3} respectively. The thrust, which is measured by a strain gauge, is up to 150 N and almost proportional to the square of the discharge current. The estimated thrust density and specific thrust are on the orders of 10^5 N/m^2 and 10^4 s.

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