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Pulsed plasma thruster by applied a high current hollow cathode discharge MASAYUKI WATANABE, Nihon University, N. NOGERA TEAM, T. KAMADA TEAM — The pulsed plasma thruster applied by a high current hollow cathode discharge has been investigated. In this research, the pseudo-spark discharge (PSD), which is a one of a pulsed high current hollow cathode discharge, is applied to the plasma thruster. In PSD, the opposite surfaces of the anode and cathode have a small circular hole and the cathode has a cylindrical cavity behind the circular hole. To generate the high speed plasma flow, the diameter of the anode hole is enlarged as compared with that of the cathode hole. As a result, the plasma is accelerated by a combination of an electro-magnetic force and a thermo-dynamic force inside a cathode cavity. For the improvement of the plasma jet characteristic, the magnetic field is also applied to the plasma jet. To magnetize the plasma jet, the external magnetic field is directly induced nearby the electrode holes. Consequently, the plasma jet is accelerated with the self-azimuthal magnetic field. With the magnetic field, the temperature and the density of the plasma jet were around 5 eV and in the order of 10 19 m^{-3} . The density increased several times as compared with that without the magnetic field.

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