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Small-sized plasma jet by a high current pseudo-spark discharge and its electrode durability M. WATANABE, Y. SUZUKI, M. MIYAHARA, T. KAMADA, IQS, NIHON UNIVERSITY COLLABORATION, CST, NIHON UNIVERSITY COLLABORATION, HACHINOHE NATIONAL COLLEGE OF TECH. COLLABORATION — In this research, a small size of the plasma jet by a modified pseudo-spark discharge (PSD) has been developed. In the previous researches, the damage of the electrode with the PSD discharge was regarded as small because the discharge can keep the glow mode even if the discharge current exceeds the several kilo amperes high. This PSD is applied to the plasma source of the high current plasma jet. An electromagnetic force accelerates the plasma, similar to the MPD Thruster. In our experiment, the plasma jet has been experimentally conformed by an electric double probe and the temperature and density of the plasma jet were estimated by this measurement. The temperature was 3-5eV and the density was in the order of 10^{19} m^{-3} at the maximum discharge current of 2kA. The temperature will depend on the intensity of the discharge current and the density will depend on the volume inside the cathode cavity. The durability of the electrodes has been tested at the present time. The concentration of the electrode erosion has been observed around the cathode hole after series of the several hundred PSD discharges. In this experiment, the cathode damage by heat flux was a serious and the damage of the anode and inside the hollow cathode does not observe.

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