Contribution ID: **3523** Type: **not specified**

P4.3019 A small sized electron beam source utilizing hollow cathode plasma for an electron supply source

Thursday, 11 July 2019 14:00 (2 hours)

See full abstract here:
http://ocs.ciemat.es/EPS2019ABS/pdf/P4.3019.pdf

Hollow cathode discharge is able to generate a high density plasma inside the hollow cathode cavity [1]. To develop a small sized electron beam source with a high current and high durability, the hollow cathode discharge is applied to an electron source for the high current electron beam in this research. The schematic diagram of the electrode parts of a newly designed electron beam source is shown in Fig.1. The maximum diameter of this device is φ 36 mm. The diameter and length of the hollow cathode cavity are φ 10 and 40 mm respectively. The distance between the hollow cathode and the anode is 5 mm, and the distance between the anode and the extraction electrode is 12 mm. The diameter of electrode holes for the electron beam is φ 6 mm. A gas is injected into the hollow cathode side after the interior of the vacuum vessel is evacuated by using a vacuum pump. The used gas is air in this experiment. First, to generate hollow cathode plasma, a high voltage is applied at the hollow cathode. Here, the anode was grounded in this experiment. Thereafter, an electron beam is formed by applying the pulsed (AC) or the steady-state (DC) voltage between the extraction electrode and the anode. In this presentation, evaluations on the characteristics of a hollow cathode plasma and initial results of electron beam formation are reported.

[1] R. Mavrodineanu, Hollow Cathode Discharges - Analytical Applications, Journal of Research of the National Bureau of Standards. 89, (1984)

Presenter: NAKAMURA, H. (EPS 2019)

Session Classification: Poster P4

Track Classification: LTPD