

INVESTIGATION OF THE PLASMA PARAMETERS OF A NON-SELF-SUSTAINED GLOW DISCHARGE INSIDE HOLLOW CATHODES OF DIFFERENT SHAPES

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To generate low-temperature plasma in a vacuum chamber or inside a hollow cathode at low pressures, a hollow cylindrical cathode is widely used. In contrast to discharges with flat cathodes, a discharge with a hollow cathode makes it possible to obtain plasma with a higher concentration.

A two-discharge system for plasma generation inside a long hollow cathode is proposed. In such a system, the main non-self-sustained glow discharge generates a dense plasma inside the hollow cathode, and the auxiliary discharge with a combined incandescent and hollow cathode is a source of additional electrons that are injected through a grid installed at the end face of the main discharge hollow cathode. The main discharge burns at pressure up to 1 Pa, voltage from 100 V to 500 V and current up to 10 A.

The plasma parameters were measured using double cylindrical probes mounted along the hollow cathode. The scheme of experiments to study the parameters of the plasma of a non-self-sustained glow discharge with a straight hollow cathode is described in detail in [1]. This work is a continuation of the study of plasma parameters inside a long hollow cathode and shows the influence of the shape of the hollow on the parameters of the generated plasma.

REFERENCES

- [1] D. Yu. Ignatov, S. S. Kovalsky, V. V. Denisov, I. V. Lopatin, and N. N. Koval, "Influence of the discharge burning conditions on distributions of the parameters of plasma generated in a non-self-sustaining glow discharge inside a hollow cathode," *Russian Physics Journal*, Vol. 64, No. 11, pp 2170 – 2176, March, 2022.