RESEARCH OF INFLUENCE OF CONNECTING WAYS OF CATHODES ac POWER SUPPLY ON PLASMA PARAMETERS MODULATION IN ION SOURCE GDC [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2020.47.1.118

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Gas discharge chamber (GDC) of the STIS-1S ion source [1] is designed to generate plasma with parameters that supply ions with a given uniform current density to an emission boundary with an area of hundreds of cm2. It is a water-cooled copper cylinder with a diameter of 30 cm and has an exit window size 20x50 cm. A set of 24 “hairpin” tungsten wire cathodes with a total electron emission area of 100 cm2 is installed inside the GDC with a possibility of changing the working cathodes number. The GDC case is the arc discharge anode; to ensure good confinement of the discharge plasma, it is equipped with lines of permanent magnets made of Nd-Fe alloy, creating a “peripheral” alternating magnetic field which is about 1 kGs at the inner wall of the chamber and decreases almost exponentially in radius. Earlier studies of the parameters of the ion current on the emission surface of this GDC [2] showed a noticeable level of signal modulation associated with the cathodes heating by an alternating current. In this work, we studied the possibility of reducing the level of modulation of the ion current with use of various methods of the power supply equipment connection to the GDC. For three connection options dependences of the ion current modulation on the emission surface are investigated and the optimal option with the oscillations amplitude less than 10% is determined.

References

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2. Barkalov K.E., Barkalov E.E., Panasenkov A.A. *«*[*Measurment of plasma parameters in GDC STIS-1S.*](http://www.fpl.gpi.ru/Zvenigorod/XLVI/Lt/en/GO-Barkalov_e.docx)*»*, XLVI International (Zvenigorod) Conf. on Plasma Physics and Controlled Fusion, 2019., Book of abstracts, p.193.

1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/XLVII/Lt/ru/ET-Barkalov.docx) [↑](#footnote-ref-1)