THE FIRST RESULTS ON THE INJECTION OF THE HF-RADIATION FROM THE GYROTRON INTO THE VACUUM CHAMBER OF THE T-15MD TOKAMAK [[1]](#footnote-1)\*)

DOI: 10.34854/ICPAF.2023.50.2023.1.1.068

Pimenov I.S., Borschegovskiy A.A., Novikov V.N., Pavlov V.N., Roy I.N., Shapotkovsky N.V.

NRC “Kurchatov Institute”, 1 Akademika Kurchatova pl., Moscow, 123182, Russia, pimenowigor@mail.ru

At the present moment, the final stage of work is being carried out for the first experiments with circle cross-section plasma on the T-15MD tokamak. At the first stage, a gyrotron with an operating frequency of 82.6 GHz and an output power of about 1 MW will be used [1]. At the moment, a focusing HF-launcher for injection HF-radiation is installed in one of the equatorial port of the T-15MD [2]. It can be used as for breakdown of the working gas as for heating the plasma [3,4]. The power density of the HF-radiation in the cross-section of the focusing beam is about
250 kW/cm2. Breakdown will occur at the second harmonic of an extraordinary mode.

After the installation of the HF-launcher, the evacuated waveguide was assembled. The total length of which is 37 m. A dielectric isolation is installed at the end of the transmission line between the T-15MD and the waveguide. To prevent mechanical tens at the end section of the waveguide, the connection between the waveguide and the tokamak is carried out by means of a bellows. The waveguide is equipped with two vacuum posts located at a distance that excludes the influence of scattered magnetic fields of the tokamak. Based on the results of preliminary tests of the mounted waveguide, in order to reduce the losses of transmitted microwave power, additional supports were installed in the area of linear thermal expansion compensators and waveguide pumping ports.

The results obtained during the tests will be included in the report.

This work was supported by NRC «Kurchatov Institute».

References

1. G.G. Denisov, V.I. Malygin, A.I. Tsvetkov et al., Izvestiya vuzov. Radiofizika **LXIII** (5–6), 369 (2020)
2. I.S. Pimenov, V.I. Belousov, A.A. Borschegovskiy, M.Y. Zharkov, S.V. Neudatchin, I.N. Roy, E.N. Khayrutdinov, L.G. Popov, M.V. Agapova and L.M. Belnova, HF-launcher system of the gyrotron set-up of the T-15MD tokamak on the first stage operation, Applied Physics, 2022, №1, p. 5-11
3. N.A. Kirneva, D.A. Shelukhin, A.A. Borchegovskiy et al., *34th EPS Conference on Plasma Phys. Warsaw, 2 - 6 July 2007 ECA Vol.****31F****, P-1.164 (2007)*
4. A. Borshchegovskiy, M. Dremin, V. Il’in, N. Kirneva et al., EPJ Web of Conferences **32**, 02004 (2012)
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/Mu/ru/AA-Pimenov.docx) [↑](#footnote-ref-1)