

RESULTS OF THE FIRST EXPERIMENTS ON THE T-15MD ^{*)}

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The T-15MD is a tokamak with a low aspect ratio ($A = 2.2$, $R = 1.48$ m, $a = 0.67$ m), a toroidal magnetic field up to $B_t = 2.0$ T, a D-shaped plasma cross section with ellipticity up to 1.8 and triangularity up to 0.4. Four additional plasma heating systems are provided on the tokamak: gyrotrons with the frequency of electron-cyclotron resonance, neutral injection, heating at the frequencies of ion-cyclotron and lower hybrid resonances.

In 2023, two experimental campaigns were carried out on the T-15MD with a plasma limiter configuration (graphite limiter, $a = 0.67$ m) and a toroidal magnetic field $B_t = 1.0 \div 1.2$ T. For gas breakdown and optimization of the current rise stage, a preionization gyrotron with a radiation frequency of 82.6 GHz and a power of 1 MW was used. During the experiments, plasma discharges with a current of up to 260 kA, a temperature of $T_e = 3\text{--}3.5$ keV and an average chord density of $n_e = 6 \times 10^{18} \text{ m}^{-3}$ were obtained. With a plasma current of 190 kA, a record pulse duration of 2 s (Fig.1) was achieved for domestic tokamaks. In the future, it is planned to introduce into operation an additional plasma heating and current drive systems, retrofit the tokamak with diagnostics, install a lower divertor and cover the vacuum chamber wall with graphite tiles.

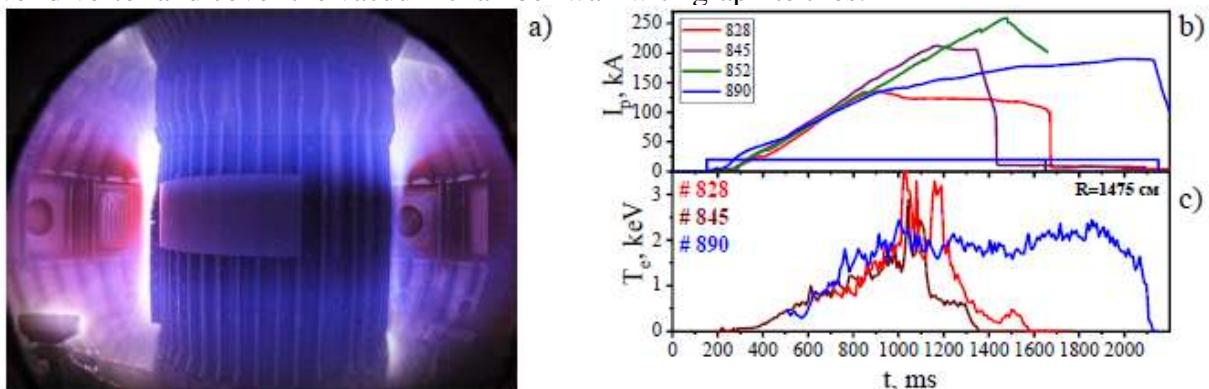


Figure 1. Plasma discharge in T-15MD: a) plasma in T-15MD; b) oscillograms of plasma currents in several pulses (numbers are indicated in the figure field); c) plasma temperature in the center of the vacuum chamber, measured by Thomson scattering diagnostics.

^{*)} [abstracts of this report in Russian](#)