simulation of the ohmic regimein the t-15md tokamak based on the canonical profile transport model [[1]](#footnote-1)\*)

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In this work, the ohmic discharges are simulated at the first stage of the T-15MD tokamak operation with reduced values ​​of the magnetic field *B* = 1 – 1.8 T and the plasma current *I* < 1.5 MA. We consider plasmas with a circular configuration (elongation *k* = 1, triangularity δ = 0 and a small radius *a* = 0.67 m).

The standard transport model of canonical profiles [1] is used for calculations. Equations are solved for the electron temperature *T*e, ion temperature *T*i and current diffusion. The plasma density profile is set in such a way that the normalized calculated pressure profile *p*(ρ)/*p*(0) constructed in the normalized coordinates ρ = *r*/(*IR*/*kB*)1/2 is the same in all modes, as observed in experiments on different tokamaks [2]. The dependence of the electron and ion temperatures on the average density is considered in a wide range of values $\overbar{n\_{e}}$​​ < 0.8*n*Gr (where *n*Gr =*I*/π*a*2 is the Greenwald density).

Using the concept of equivalence of pairs of discharges for different tokamaks [1], the calculated profiles of the electron temperature in the T-15MD tokamak are compared with the experimental profiles obtained on the T-10 tokamak in discharges with low values ​​of the toroidal magnetic field (*B* = 1.7 – 2.1 T).

The comparison shows that the RMS deviations between the normalized equivalent experimental and calculated electron temperature profiles are ~ 6-8%



Fig.1. Normalized profiles of electron temperature in the ohmic mode: calculated profiles (T-15MD) for different values ​​of the toroidal field, plasma current and experimental profile (T-10), edge safety factor qa = 4.

References

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2. Razumova K.A., et al. Nucl. Fusion. 49 (2009) 065011
1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/Mu/ru/BU-Kas%27yanova.docx) [↑](#footnote-ref-1)