Plasma heating study DURINg NEuTRAL BEAM INJECTION AT GLOBUS-M2 TOKAMAK [[1]](#footnote-1)\*)

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This report describes the study of plasma heating in Globus-M2 tokamak [1] using high-energy neutral beams. The experiments were carried with the toroidal magnetic field *B*T = 0.8 – 0.9 T and plasma current *Ip* = 0.3 – 0.4 MA. The tokamak discharge scenario included two neutral beam injectors (NBI) operating simultaneously: one with particle energy *ENBI1* = 25-28 keV and power *PNBI1* ≤ 0.45 MW, other – *ENBI2* = 30-45 keV with *PNBI2* ≤ 0.75 MW. The line average density was varied in the range 0.15 – 1.6 ⋅1020 m-3.

Thomson scattering diagnostics [2] performed measurements of electron temperature *Te* and density *ne* spatial distributions, which were used to calculate the electron stored energy *We* dynamics. The *We* dependence on electron density was studied and compared between scenarios with double NBI, single NBI and only ohmic heating. The hot ion mode was achieved in the double NBI scenario. The central ion temperature (up to 4 keV [3]) exceeded the central electron temperature (up to 1.6 keV) in the wide density range. The study of the plasma energy balance indicated neoclassical ion thermal conductivity for the double NBI scenario.

The achieved results demonstrate the high ion temperatures in the compact spherical tokamak with a relatively low values of toroidal magnetic field and plasma current.

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References

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1. \*) [abstracts of this report in Russian](http://www.fpl.gpi.ru/Zvenigorod/L/Mu/ru/AB-Zhiltsov.docx) [↑](#footnote-ref-1)