First results of the particle and heat flux transport study in the spherical tokamak Globus-M2

A.Yu. Telnova, G.S. Kurskiev, N.N. Bakharev, V.K. Gusev, E.O. Kiselev, N.A. Khromov, M.M. Larionova, V.B. Minaev, I.V. Miroshnikov, M.I. Patrov, Yu.V. Petrov, N.V. Sakharov, P.B. Shchegolev, V. A. Tokarev, S.Yu. Tolstyakov, E.A. Tukhmeneva

Ioffe Institute, St. Petersburg, Russia

The presentation is devoted to particle and heat flux study in the Globus-M2 tokamak [1]. Globus-M2 is a spherical tokamak with the major radius $R = 0.36$ m and the minor radius $a = 0.24$ m (aspect ratio $A = 1.5$), and is the upgraded version of the Globus-M tokamak [2]. The upgrade allows increasing the plasma current I_P up to 500 kA and a toroidal magnetic field B_T up to 1 T. The aim of the study was to determine the effectiveness of thermal insulation in a compact spherical machine with neutral beam heating for the new experimental conditions. The first measured results of the electron temperature and density, the ion temperature and the total stored plasma energy for OH and NBI modes are presented and used for calculations. The calculations were carried out using the ASTRA code [3]. The main attention is paid to the safety factor influence on the particle and energy confinement in the modes with early NBI started at the current ramp up phase.

References

[1] Minaev V.B. et al, 2017, *Nucl. Fusion*, 57 066047;

[2] Gusev V.K. et al, 1999, *Tech. Phys*. 44;

[3] Pereverzev G. and Yushmanov P. N., 2002, *Max-Plank IPP Report,* 5/98.