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Thermal energy confinement at the Globus-M spherical tokamak.

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The presentation is devoted to the overview of thermal energy confinement time study at the compact spherical tokamak Globus-M. Globus-M has major radius R = 0.35 m and minor radius a = 0.21 m (R/a ~ 1.6). The lower-null magnetic configuration is characterized by moderate elongation k~1.9 and triangularity δ~0.35. The present study was performed in both OH and NBI heated H-mode plasma. The regression fit of the database indicates strong τE dependence on both plasma current Ip and toroidal magnetic field BT, while the dependence on density ne and absorbed power P was similar to the conventional scaling IPB98(y,2). The electron heat diffusivity is strongly affected by the plasma current and the toroidal magnetic field. The BTτE dependence on ν^* is found be similar to NSTX and MAST results, while q dependence is stronger than on MAST, but weaker than in ITER scaling.

The second part of the presentation is devoted to study of the particle and heat transport in regimes with qmin>1. Such transient operational modes were investigated using NBI at the current ramp-up phase, that usually causes ITB formation for particle and/or for electron heat flux (e-ITB). In the case of internal diffusion barrier it is located in the region r/a ~0.4, the e-ITB is located at r/a ~0.7. These advanced regimes are characterized with enhanced energy confinement relative to conventional H-mode.

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