DOI: 10.34854/ICPAF.51.2024.1.1.068

NUMERICAL SIMULATION OF MECHANICAL BEHAVIOR OF THE NEXT GENERATION SPHERICAL TOKAMAK GLOBUS-3 MAGNET SYSTEM*)

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Numerical simulation of the next generation spherical tokamak GLOBUS-3 magnet system mechanical behavior is done using complex approach previously used for design and analysis of the GLOBUS-M2 machine. This approach is based on the usage of CAE-system for the investigation of magnet system mechanical behavior. 3D mathematical model of magnet system is developed on the basis of its preliminary design. Then mechanical behavior (stress state) of magnet system is analyzed under design loads such as deadweight, thermal and electromagnetic spatially distributed loads and their combinations using mathematical model. At post processing of the obtained results the extraction of stresses by categories is performed to match them with mechanical strength criteria. In the case of unacceptable results the iteration procedure design changes – supporting analyses is performed up to achieving of the mechanical criteria.

Performed simulation helps develop the concept of the magnet system and overall design of the machine.

The work was supported by the Russian Science Foundation (agreement no. 21-79-20133 of March 24, 2021, between the Russian Science Foundation and JSC NIIEFA). Experimental data stored in “Material science and diagnostics in advanced technologies” database of Ioffe Institute of Physics and Technology have been used in this job.

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*) abstracts of this report in Russian