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STATUS OF WORK ON THE DEVELOPMENT OF THE GDMT PROJECT *)

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At the Budker Institute of Nuclear Physics (BINP) in collaboration with a number of domestic organizations are conducting research aimed at developing technologies necessary for the implementation of nuclear fusion applications based on open-type magnetic traps with a linear axisymmetric configuration. In the future, such applications are seen as powerful sources of DT-fusion neutrons, and with successful further development, relatively compact power reactors.

The indicated researches are focused on the development of the Gas Dynamic Multiple Mirror Trap (GDMT) project [1], which should become a demonstrator of the developed technologies.

Currently, work has been completed on the development of a preliminary design of the GDMT, one of the distinctive features of which is magnetic plugs based on second-generation HTSC with an induction of up to 20 T. The preliminary design of the corresponding mirror plug units was carried out jointly with the SuperOx company [2]. The mission of the GDMT is to demonstrate experimentally, under stationary conditions, a radical improvement in plasma confinement compared to the classical Budker-Post mirror trap. This result is planned to be achieved through the use of end multi-mirror or helical sections capable of limiting the longitudinal flows of particles and plasma energy, as well as through the transition to the diamagnetic confinement mode, when the relative pressure $\beta \to 1$.

To support the GDMT project, four experimental installations have been constructed and are successfully operating at the BINP, where the key problems of the project related to longitudinal confinement and confinement with $\beta \to 1$ are being solved

The planned report will provide information on the preliminary design of the GDMT and provide an overview of the state of the art in supporting research.

References

[1]. Skovorodin D.I. et al. // Plasma Physics Reports, V. 49, P. 1039–1086, 2023.
[2]. https://www.superox.ru

*) abstracts of this report in Russian