mechanisms of plasma axial confinement in gas dynamic trap [[1]](#footnote-1)\*)

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In the Institute of Nuclear Physics SB RAS, an experimental and theoretical study of plasma confinement in an open magnetic trap is carried out [1]. Today such systems are promising in terms of creating powerful neutron sources and even thermonuclear reactors on its base. This is due to a much simpler technical design compared to tokamaks, therefore the price of a neutron (or kilowatt-hour of energy) can be significantly reduced. However, to implement such a project, it is necessary to study all aspects of plasma confinement in an open magnetic system, to build the necessary theoretical and mathematical models that will describe the behavior of plasma with thermonuclear parameters.

The most important aspect of work in this direction is the study of the mechanisms of particles and energy longitudinal confinement in an open trap, since knowledge of the magnitude of energy losses from such a system is key in substantiation the possibility of its future applications. In the previous studies we measured the potential jump in the Debye layer near the plasma absorber and the average electron energy in the expander region [2], as well as the energy removed from the trap by one electron-ion pair [3]. The next step was to measure the difference in the electrostatic potential between the center of the trap and the plasma absorber using the data of a tomographic system recording the broadened Hα emission line in the expander of the GDT device. All these parameters give an overall picture of longitudinal confinement in an open trap. Experiments were also carried out to study the effect of the plasma absorber shape on confinement in the GDT. The results of these experiments will be presented in the report.

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References

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