Development and first experimental results of electrostatic analyzers on GDT and CAT facilities [[1]](#footnote-1)\*)

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The study of plasma magnetic confinement being undertaken in Budker Institute of Nuclear Physics, it is split into several independent directions: in addition to noticeable success in achievement of high plasma parameters on Gas Dynamic Trap (GDT) facility [1], the realization of magnetic field reversed configuration (FRC) is studied on the new facility called Compact Axisymmetric Toroid (CAT) [2].

GDT is a linear magnetic mirror device with a large mirror ratio. Plasma ions can be divided into cold component with temperature ~100 eV and hot (~20 keV) anisotropic component, generated by 8 neutral injectors (625 kW, 5 ms), directed at the angle of 45° to the facility axis.

CAT is an axisymmetric magnetic mirror trap, aimed at reaching FRC by accumulation of azimuthal current of hot ions (~15 keV): two focused neutral injectors (2 MeV, 5 ms) are directed perpendicularly to the main axis with the impact parameter of 10 cm [3].

This work presents developed diagnostic tools based on the analysis of charge-exchanged neutrals for determining parameters of the hot component on previously mentioned facilities: 45-degree electrostatic analyzer with angular resolution for determining radial distribution of plasma density on GDT and 45-degree electrostatic analyzer with energetic resolution on CAT magnetic trap. First results, obtained during the experiment on Gas Dynamic Trap, are also presented.

References

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