CALCULATIONS OF MAGNETIC CONFIGURATIONS WITH NEGATIVE TRIANGULARITY FOR TOKAMAKS T-15MD AND TRT [[1]](#footnote-1)\*)

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In this work the calculations of some magnetic configurations with negative triangularity by using the DINA code are presented for the T-15MD tokamak with available system of poloidal coils. The structure for poloidal system of the TRT tokamak is proposed for realization discharge scenario using configurations with positive and negative triangularity.

The energy transport in magnetic confined plasmas depends on a number of parameters, such as the magnitude of the magnetic field and plasma density, but also depends significantly on plasma shape configuration. The shape of the cross section has a significant effect on energy confinement. Until recently, the concept of a divertor vertically elongated plasma configuration with positive triangularity was considered as the basic one for modern and developed tokamaks.

Some years ago the TCV tokamak investigated an inverse D shape in the course of an experiment that scanned the triangularity of the discharges from strongly positive to strongly negative. It was found that negative triangularity had reduced transport, such that discharges with triangularity δ = - 0,4 had an electron diffusion coefficient two times lower than for corresponded discharges with δ = + 0.4 [1]. On DIII-D in experiments with auxiliary heating power, it was shown that negative triangularity (NT) has improved confinement over matched positive triangularity (PT) D-shaped plasmas. Additionally, it was found that the NT shape has the capability to achieve significant normalized beta with pressure profiles absent an edge pedestal and ELMs [2]. In paper [3], the concept of using a configuration with negative triangularity (NT) as an alternative scenario for the operation of a tokamak-based thermonuclear reactor is proposed.

The presented calculations of the plasma configuration show that it's necessary to make some changes in design of inductor coils of T-15MD to provide studying of negative triangularity in wider range. The calculations of plasma configuration for discharges with positive and negative triangularity for developed TRT tokamak are also performed. It is proposed to expand the research programs on T-15MD and TRT to include the study of the influence of triangularity on the transport processes.

References

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