## DOI: 10.34854/ICPAF.52.2025.1.1.037

## RESTORATION OF TEMPORAL EVOLUTION OF THE PLASMA BOUNDARY IN THE EXPERIMENT AT THE TOKAMAK FACILITY $^{\ast)}$

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To conduct experiments and analyze the results in a tokamak, an effective plasma boundary control system is required. The paper describes such a system based on solving inverse problems, which allows obtaining information about the evolution of the plasma column during the discharge process immediately after the experiment. This is necessary to predict the plasma behavior in the following pulses. The results of electromagnetic measurements (EMD) are used as initial data for solving the inverse problem. The EMD system for the tokamak includes a set of loops measuring the voltage on the bypass cord (VCC), as well as Rogowski coils for determining the currents in the plasma and poloidal coils, in the central solenoid, and induced currents in the vacuum chamber (VC). The VCC system allows, after preliminary integration, to calculate the magnetic flux [1]. Previously, in [2], the optimization of the EMD system was carried out in terms of the location and number of sensors required to obtain a boundary with a given accuracy. A system of two-component shape sensors for measuring the magnetic field was considered.

The numerical code RPB (Reconstruction Plasma Boundary) was used to reconstruct the plasma boundary in the tokamak [3]. The RPB code is based on the application of integral equations of the first kind. The aim of this work is to use this code to reconstruct the plasma boundary for different points in time based on electromagnetic diagnostics data obtained during the autumn-winter campaign of 2023 at the T-15MD tokamak. Previously, these data were used in [4] to test the developed algorithm. The results of the analysis of the time evolution of the plasma boundary for some pulses are presented. The results of the solution of the inverse problem and their comparison with the video data are presented. They allow us to draw a conclusion about the correctness of the developed algorithm and the possibility of its application in a real experiment for analyzing the evolution of the plasma boundary.

## References

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