

TITLE

Advanced Remote Operation of the GOLEM Tokamak

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PAPER

Tokamak GOLEM at the Czech Technical University, Prague serves as an educational device making tokamak operation accessible to students worldwide via a web application. The web application has two levels:

-Basic level of remote operation enables students to set up basic discharge parameters, necessary to create plasma: toroidal magnetic and electric field, working gas pressure and tools for pre-ionization of the working gas. Consequently, measured data from basic diagnostics are acquired and presented in a hypertext form [1]. More than 800 remote discharges from foreign sites have been already successfully performed in the frame of FUSENET (Fusenet Education Network).

-The second level of operation allows to affect the vertical position of plasma using the horizontal magnetic field. It operates in two modes:

- pre-programmed control of horizontal magnetic field scenario,
- LabVIEW based real-time system, which controls the horizontal magnetic field in response to the currently measured vertical position of plasma.

The system now enables remote participants to study the effect of horizontal magnetic field on the vertical plasma position using their own approach. Relative plasma-life duration prolongation of more than 20% is now possible with respect to the mode without the stabilization.

[1] V. Svoboda, B. Huang, J. Mlynar, G.I. Pokol, J. Stockel, and G Vondrasek. Multimode Remote Participation on the GOLEM Tokamak. *Fusion Engineering and Design*, 86(6-8):1310–1314, 2011