

The tokamak GOLEM for fusion education

E. Bromová¹, I. Ďuran², O. Grover¹, J. Kocman¹, T. Markovič¹, M. Odstrčil¹, T. Odstrčil¹,
O. Pluhař³, J. Stöckel², V. Svoboda¹, A. Šindlery¹, G. Vondrášek¹, J. Zara³.

¹Faculty of Nuclear Sciences and Physical Engineering CTU Prague, CZ-115 19, Czech Rep.

²Institute of Plasma Physics AS CR, CZ-182 21 Prague, Czech Republic.

³Faculty of Electrical Engineering CTU Prague, CZ-166 27, Czech Rep.

The GOLEM tokamak (formerly CASTOR) became an educational device for domestic as well as for foreign students via remote participation/handling. It operates routinely for nearly two years at modest range of parameters $B_t < 0.5$ T, $I_p < 8$ kA, pulse length < 15 ms, and with a limited set of diagnostics. Wide range of tasks with varying levels of complexity covering tokamak physics, technology and operation can be studied by the future fusion specialists.

Currently the diagnostics enrichment is strategic for the education usability of the device. Students participate in large extent on additional standard diagnostics methods development, including density measurement via microwave interferometry, plasma position (including tomography) studies using a set of Mirnov coils, two fast cameras and two linear arrays of bolometers. Moreover stabilization of the plasma position with an equilibrium magnetic field generated in the vertical magnetic field coils and plasma spectroscopy issues are under consideration.

Simultaneously an interactive virtual world of the tokamak Golem is created accessible online. This virtual world contains rich information of the tokamak from its visual appearance to basic functionality, therefore this project will help students, professors and wide public in learning how the device works even before they go hands-on with the actual equipment.

The proposed contribution will summarize the present status of GOLEM tokamak from engineering as well as plasma performance point of view and in particular, it will present the research and educational opportunities this new device offers to the fusion community.

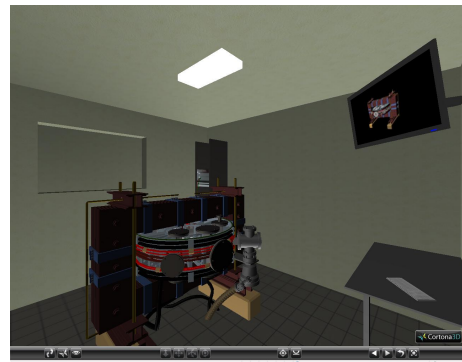


Figure 1: Virtual model of the GOLEM tokamak using VRML, Virtual Reality Modeling Language

References

- [1] Svoboda, V. and Huang, B. and Mlynář, J. and Pokol, G.I. and Stöckel, J. and Vondrášek, G. Multi-mode Remote Participation on the GOLEM Tokamak. *Fusion Engineering and Design*, 2011 (accepted for publication).