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September 17, 2010

1 Physics and Technology of Thermonuclear Fusion

2 Tokamak GOLEM

Outline

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Physics and Technology of Thermonuclear Fusion

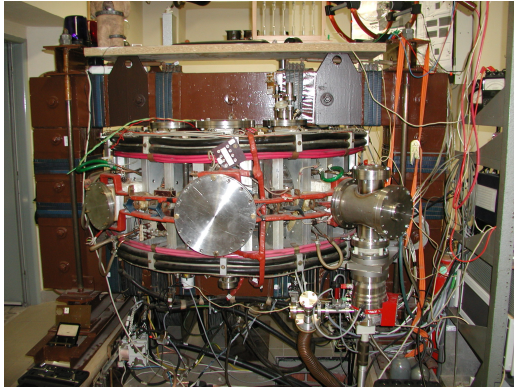
- **Main achievement: curriculum started 2006, now routine operation**
- Czech contribution to FUSENET (WP5 special courses - SUMTRAIC, WP7 practica - tokamak GOLEM, WP8 a new textbook - participation, WP9 multimedia - management, WP10 mobility - FNSPE & CUNI students.)
- February 2010: The 2nd Winter School on Plasma Physics Marianska. 11 student presentations and 7 invited.
- September 2010: 7x Bc degree examinations.
- Michal Kazda received Erasmus Mundus Master degree.
- Michal Kubič - PhD in Cadarache.
- Ondej Kudláček - Erasmus/Finland, Michal Šmíd - Erasmus/Sweden.

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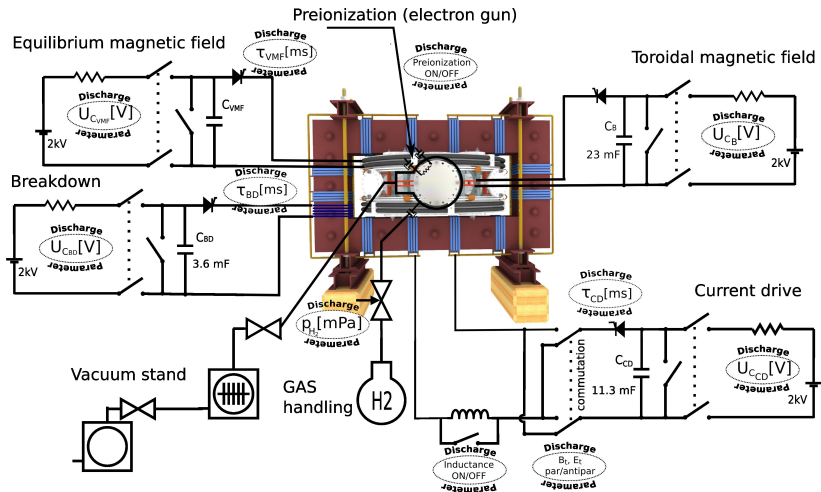
2 Tokamak GOLEM

Tokamak GOLEM

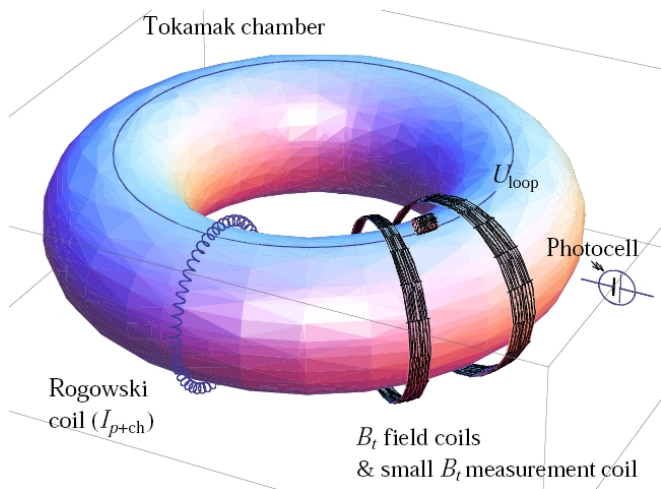


- 1960-1974
Kurchatov Institute
of Atomic Energy,
Moscow.
- 1977-2007 Institute
of Plasma Physics,
Prague.
- 2009 - Czech
Technical University,
Prague.

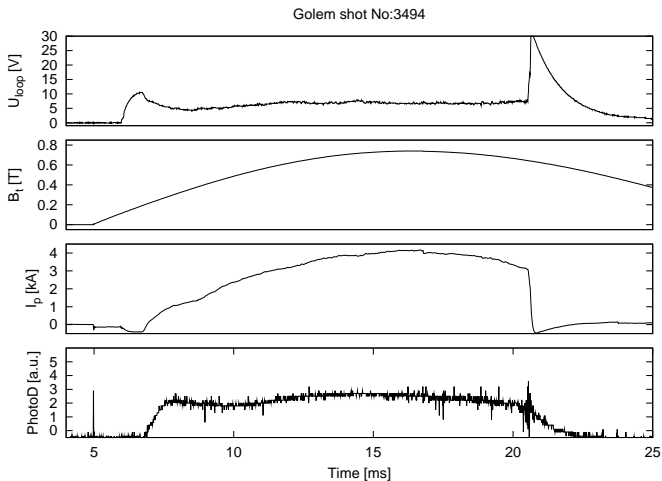
Experimental setup



Diagnostics



Typical shot (made by SUMTRAIIC 2010)



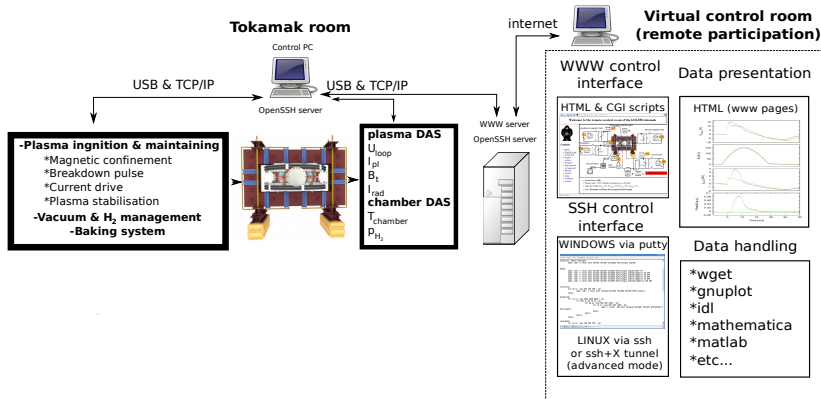
Training programmes

- Determination of vacuum chamber parameters from “vacuum shots”.
- Basic plasma analysis from data acquisition system.
- Evaluation of basic plasma parameters.
- Various types of plasma breakdown studies can be performed.
- Plasma position studies with the help of a Mirnov coils set and a linear set of 20 AXUV bolometers.
- Stabilisation of the plasma position with an equilibrium magnetic field .

Milestones


- July 2009: First plasma at the new location.
- October 2009: Remote operation from Austria, Poland, France,..
- January 2010: Over sea remote operation from Costa Rica.
- April 2010: First remote practica from Budapest .
- June 2010: 37th EPS conference on Plasma physics and controlled fusion (Dublin) contribution.
- August 2010: SUMTRAIC.
- September 2010: Bc thesis (Markovič) “Magnetic field configurations and their measurement on tokamak GOLEM“

Unique remote operation capability



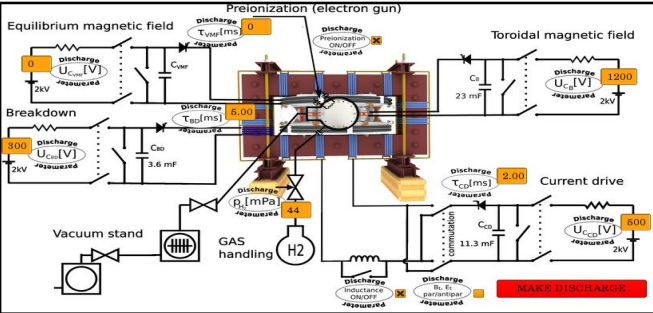
Location: <http://golem.fifi.cvut.cz/current/> Google Search

Welcome to the remote control room of the GOLEM tokamak



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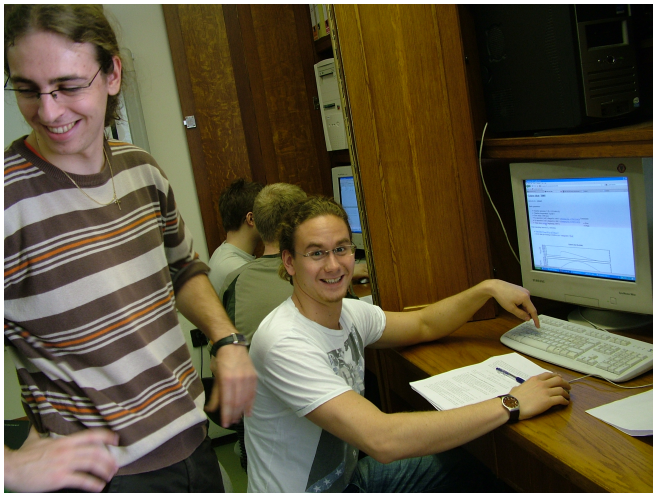


Actual status: **Idle ..**

- Session time: 18:23 ,Chamber pressure $p_{ch} = 0.91$ mPa.
- Capacitor banks $U_{CB} = 0$ V , $U_{CBD} = 0$ V , $U_{CCD} = 0$ V , $U_{CDS} = 0$ V.
- Chat: **Welcome at Golem, best regards from Prague**

Page loaded.

Remote control room (Budapest March 2010)



- September 2010: SOFT 2010 contribution.
- Group of 3 high school students from the "Cesta k vede" (Path to Science) project collaboration on the Golem tasks.
- December 2010: GTE Global Tokamak Training
<http://www.tokamakglobal.com/>
- Spring 2011: Jindrich Kocman, FNSPE CTU Prague. Bachelor thesis 2009-2010. Plasma position stabilization studies on tokamak GOLEM.
- Excursions.
- Practicum for seniors in the frame of University of third age II planned.

Summary

- New curriculum at the Czech Technical University in Prague
"Physics and Technology of Thermonuclear Fusion" now **in routine operation.**
- Tokamak GOLEM with remote access **in routine operation.**
- To be continued ..

Thank you for your attention

