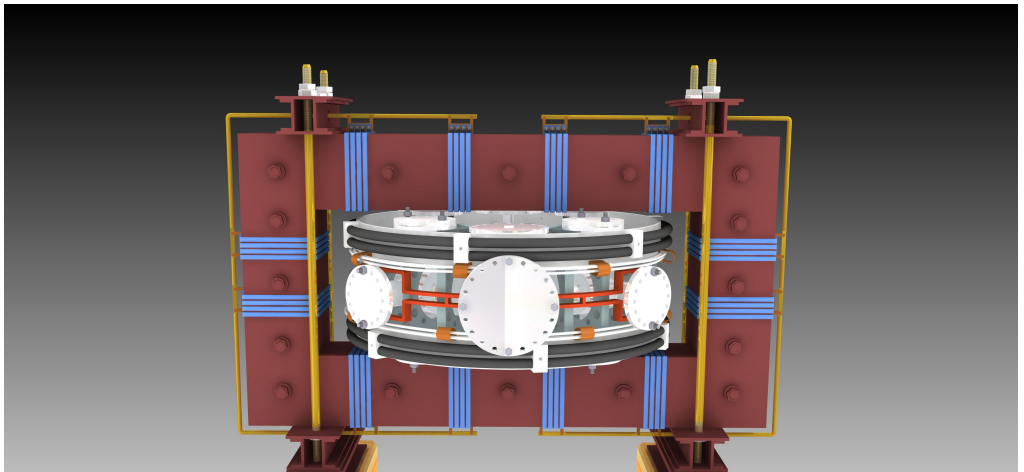
Golem 2010 - from No:1428 to No:4371

From an idea to a reality (technological point of view)

Vojtěch Svoboda → Mariánská 2011



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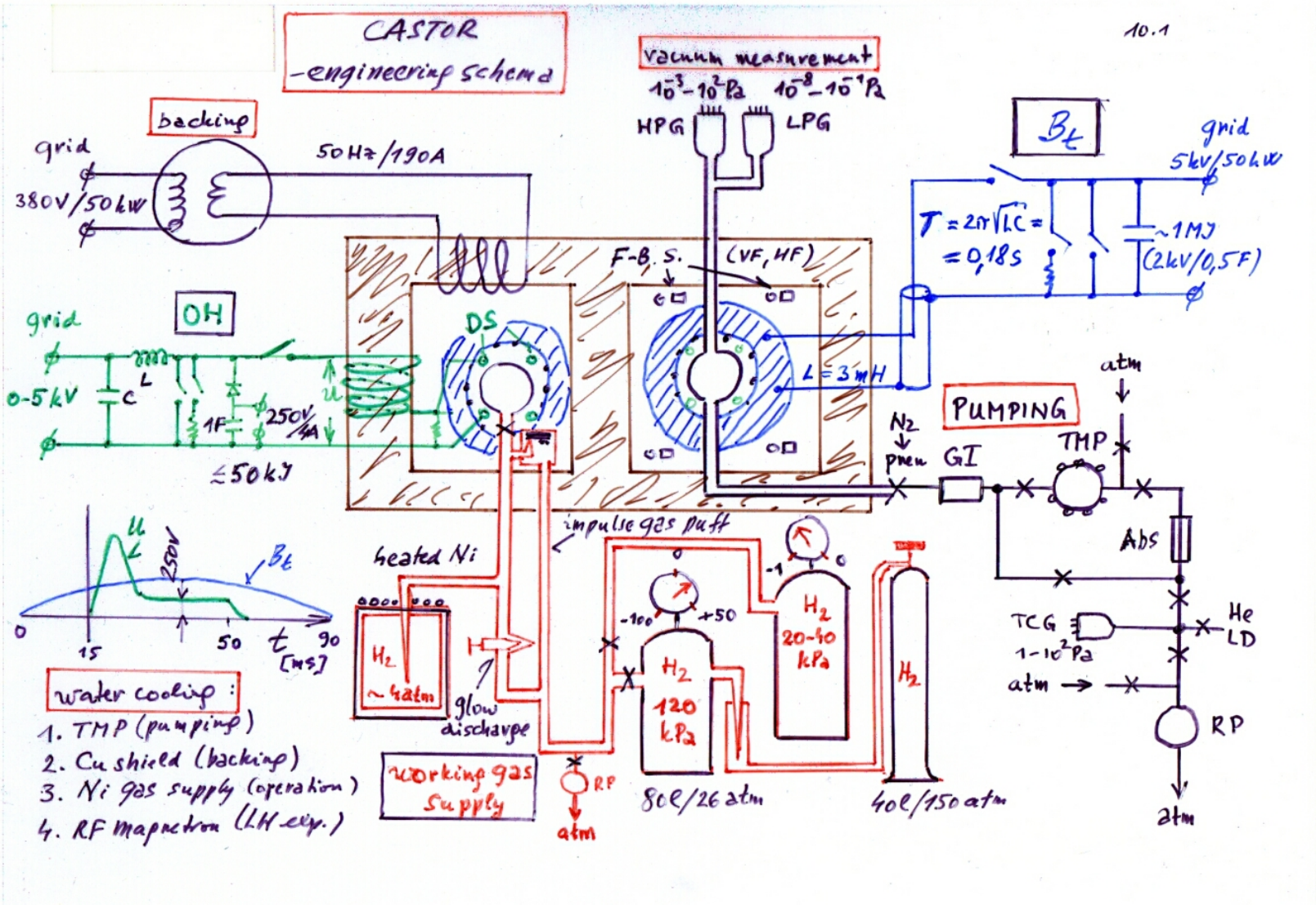
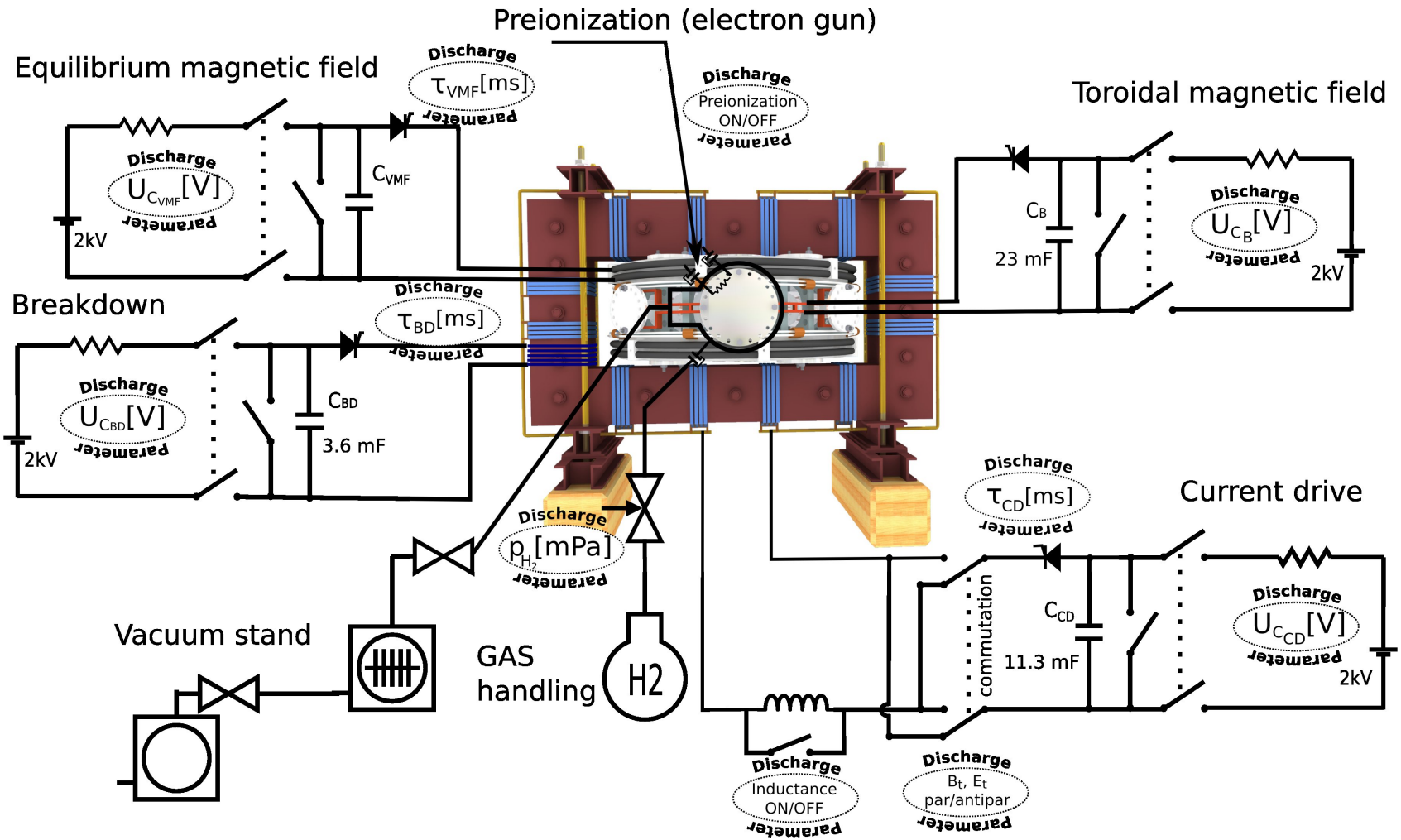
Engineering scheme of the GOLEM tokamak



Experimental setup



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 .

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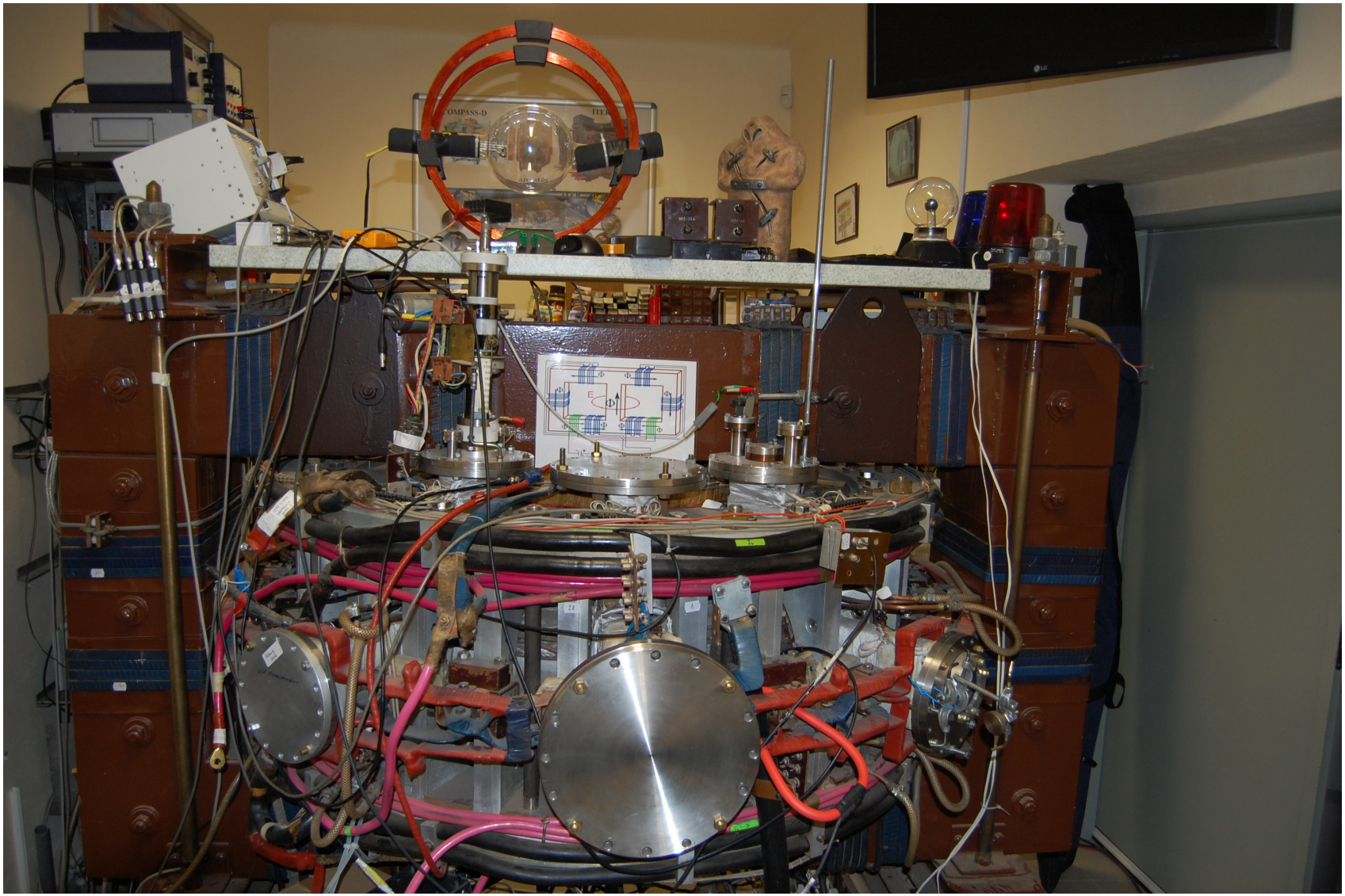
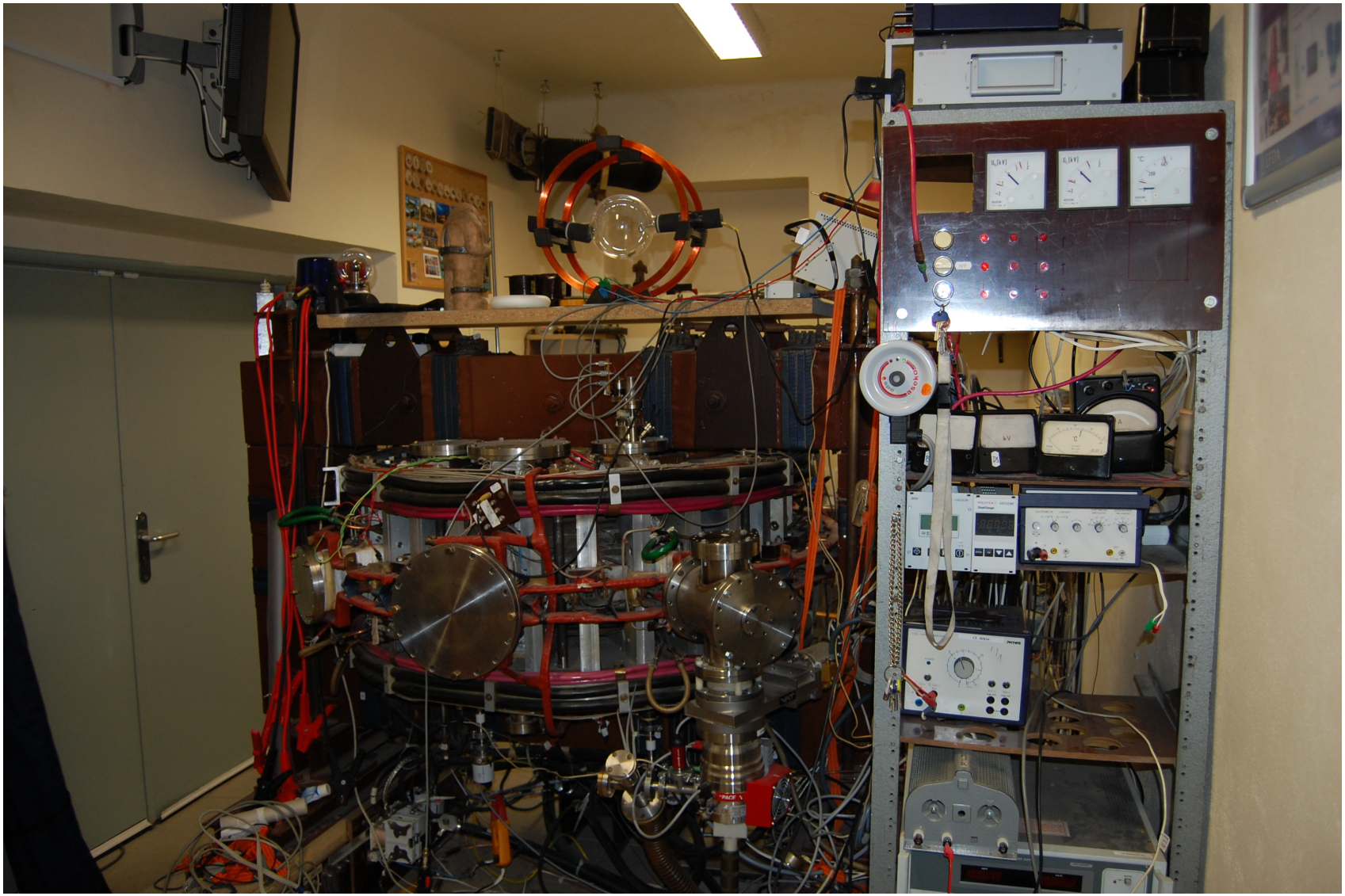
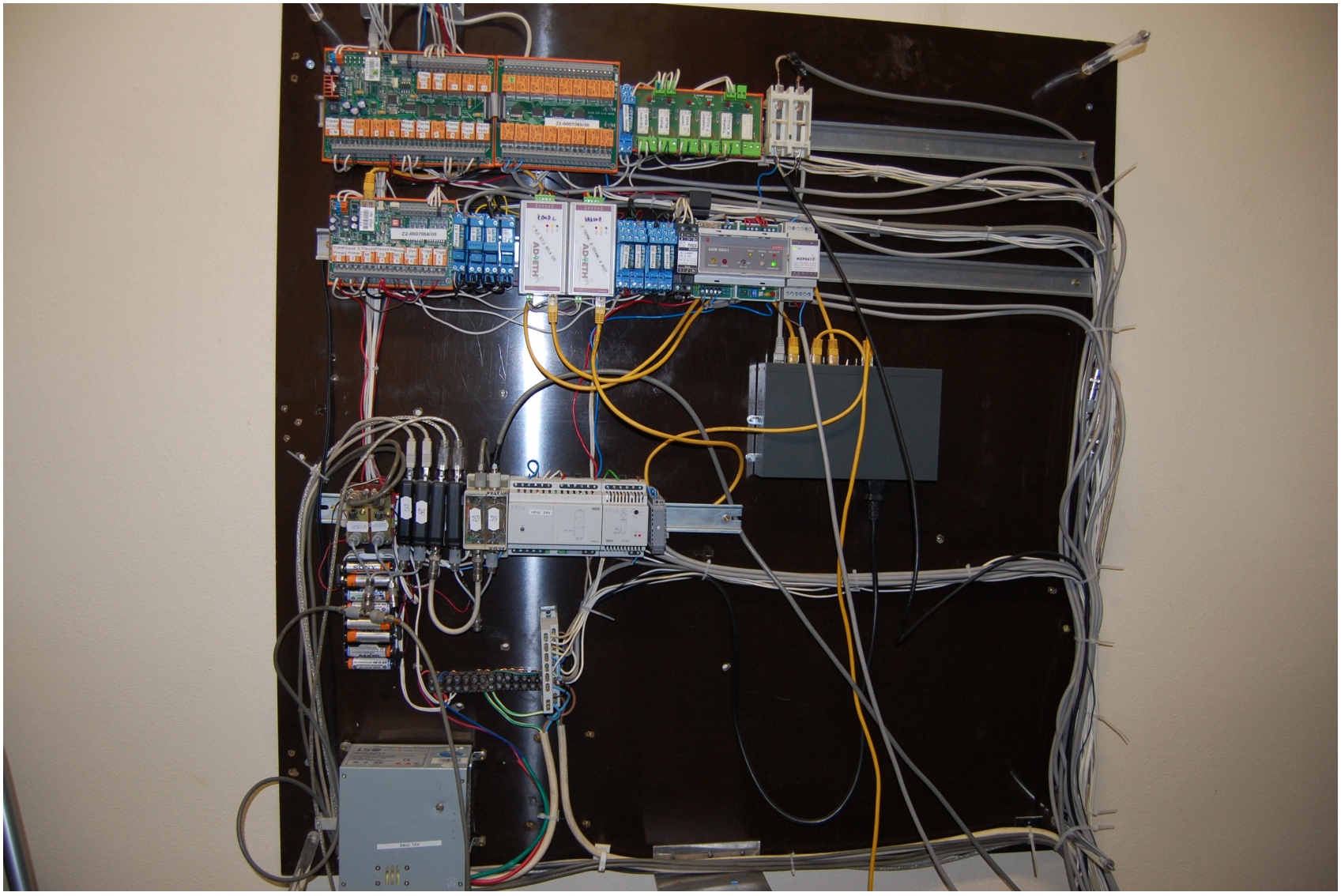
Panoramic I



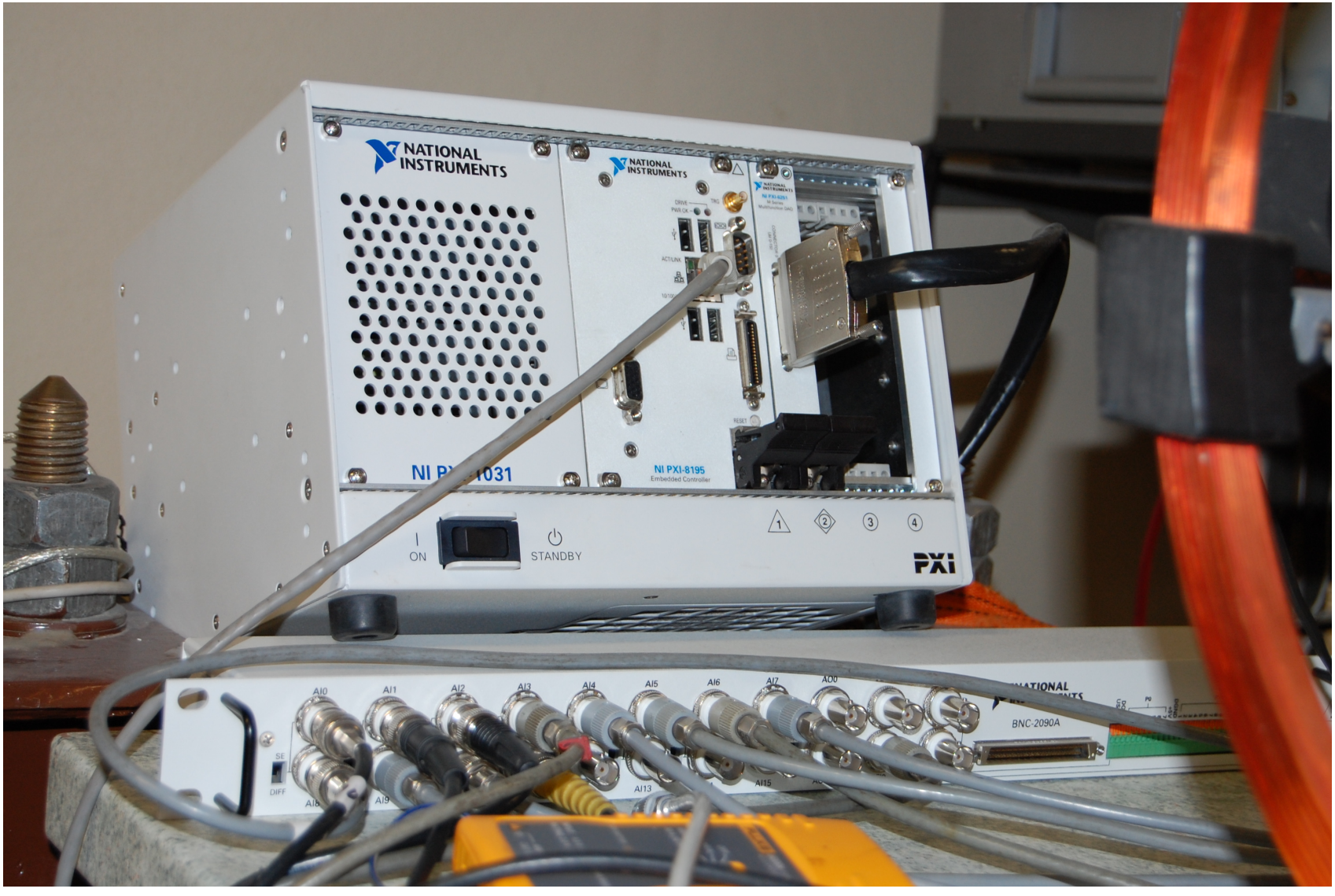
Panoramic II



Control panel



basic DAS


NATIONAL INSTRUMENTS
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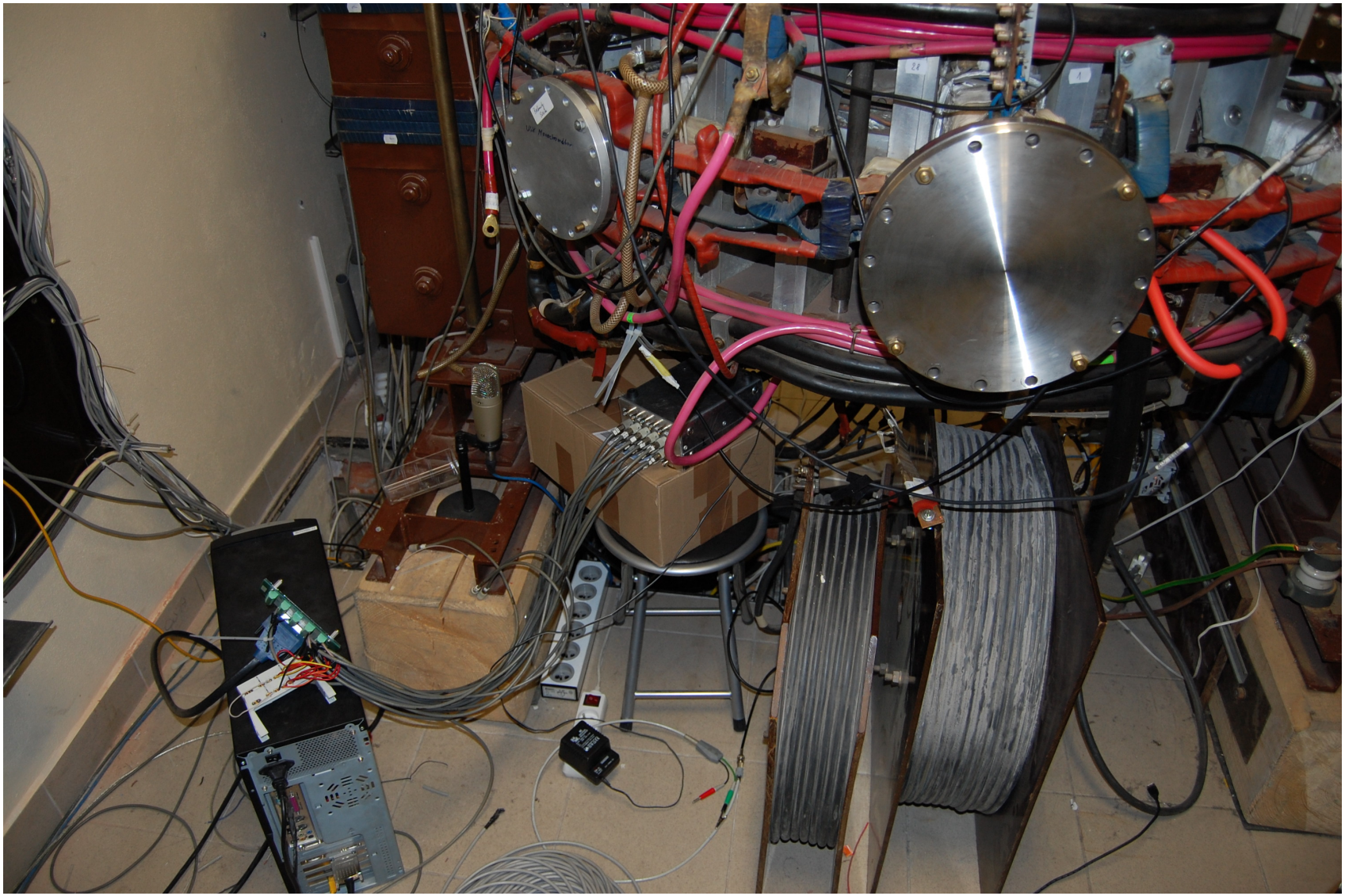
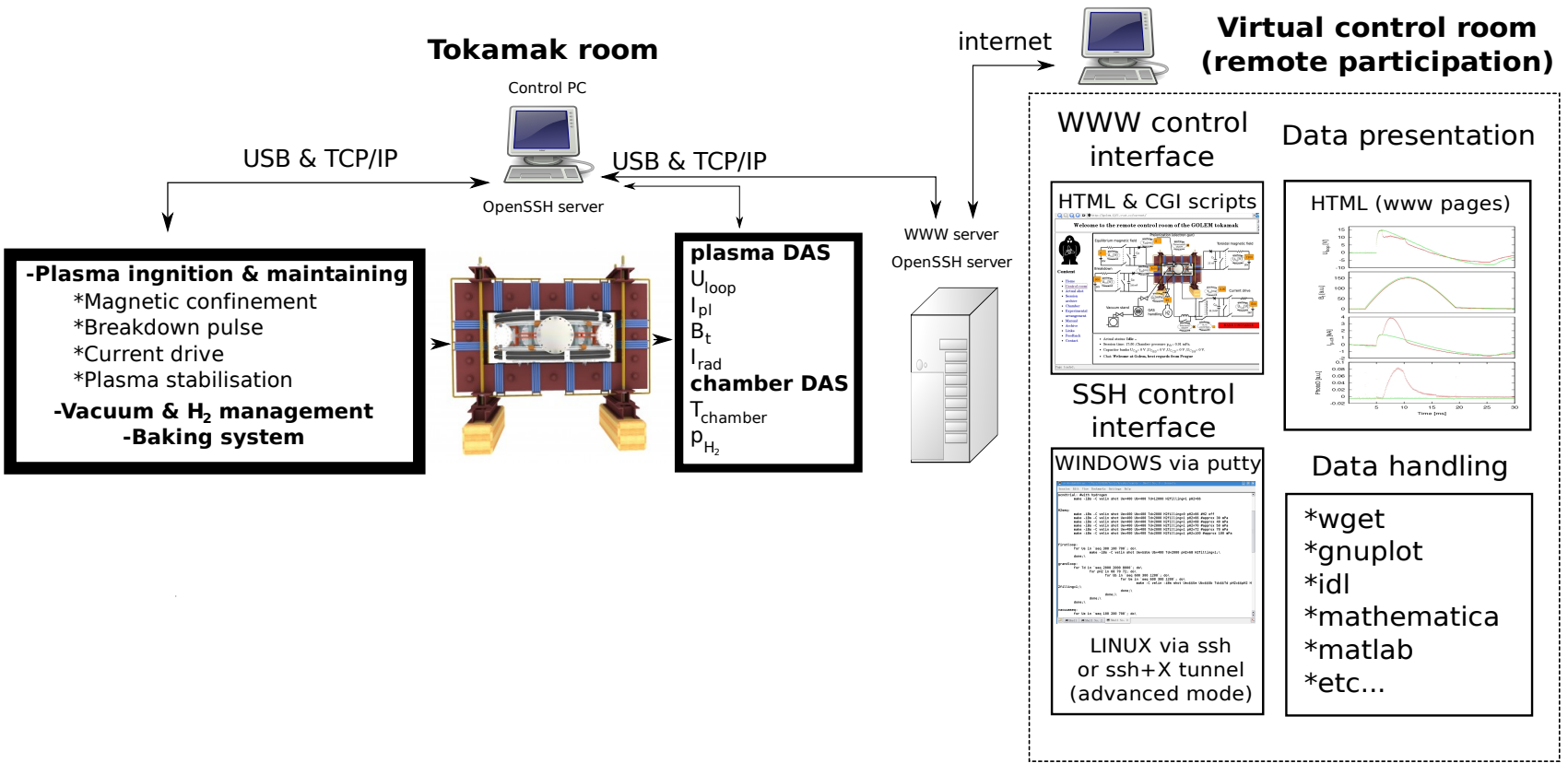
NI PXI-8195
Embedded Controller
ON
STANDBY
PXI
BNC-2090A

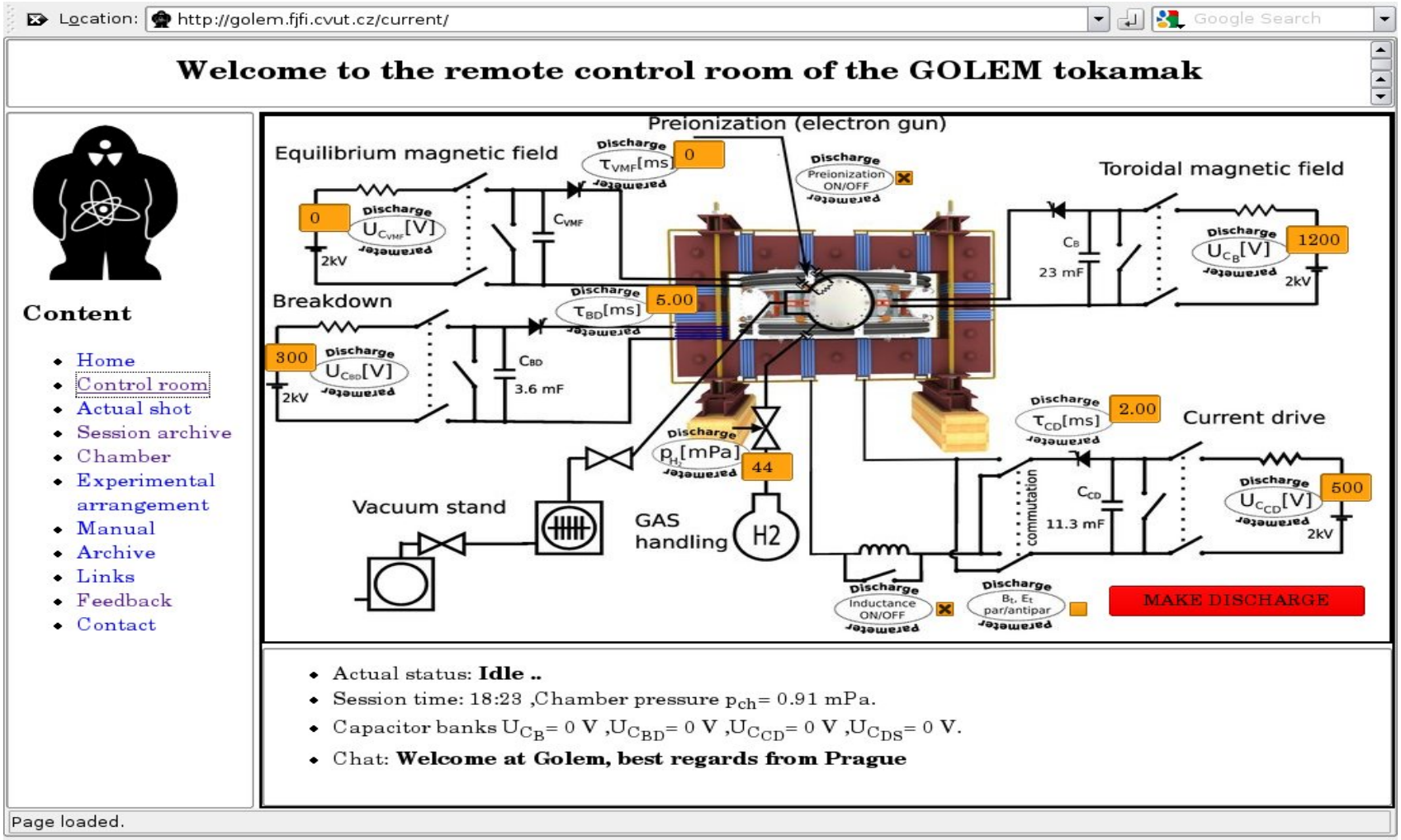
bolometry DAS (PC)



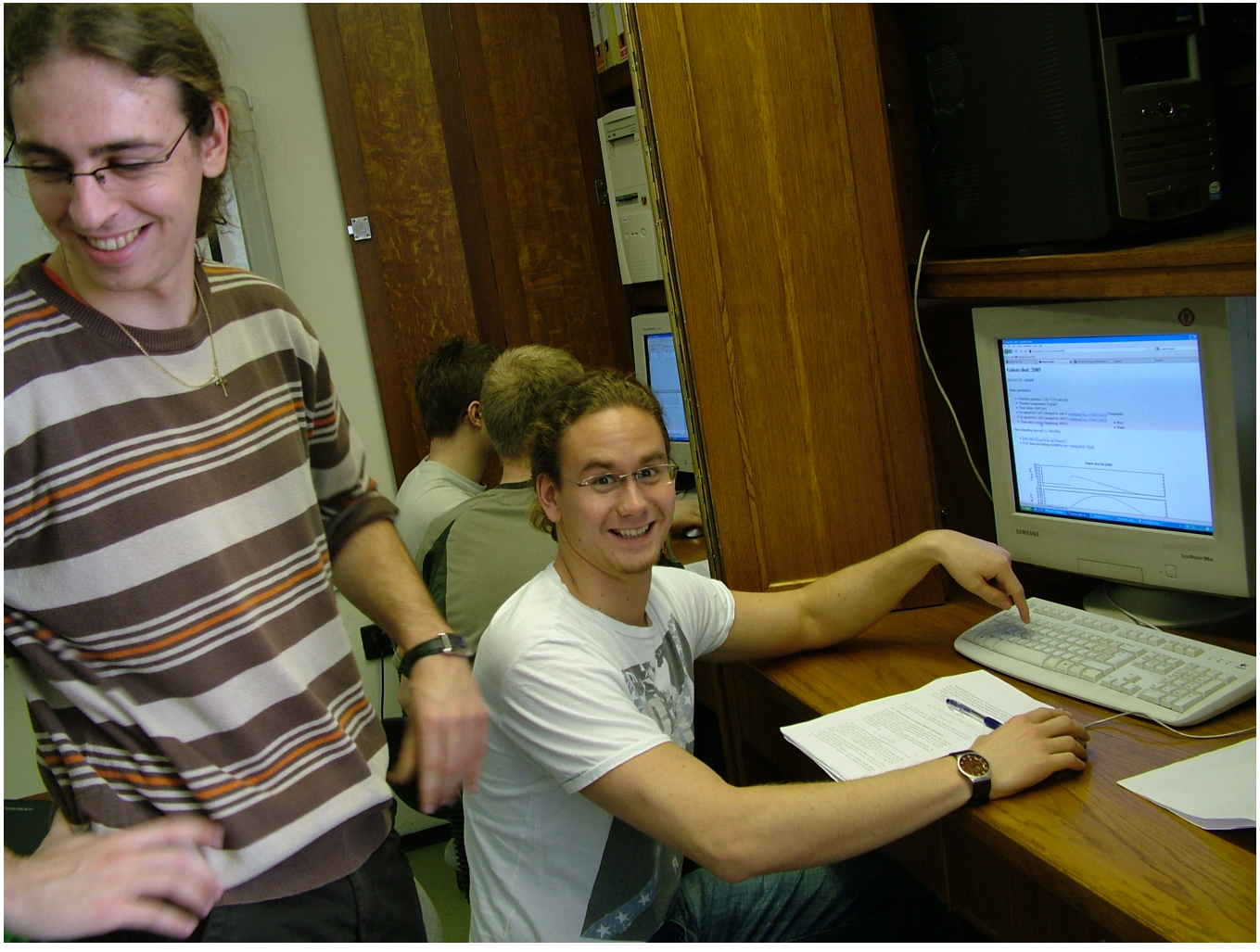
Unique remote operation capability



WWW interface



Remote control room (Budapest March 2010)



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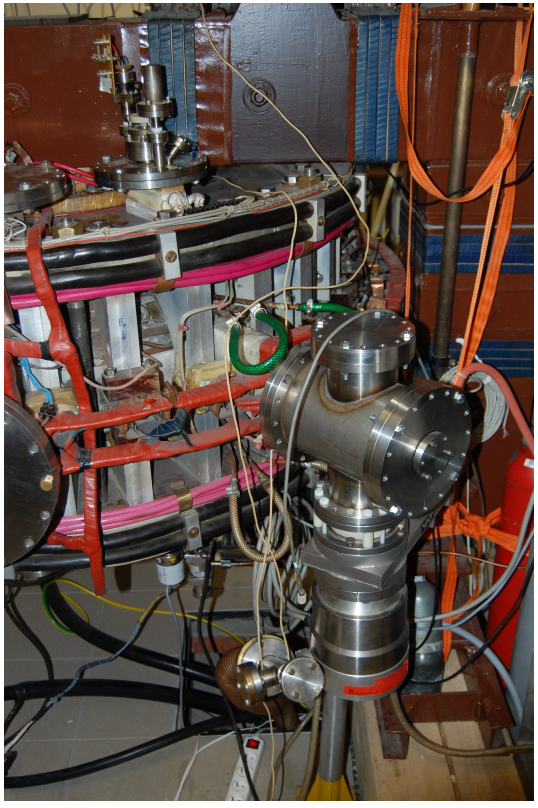
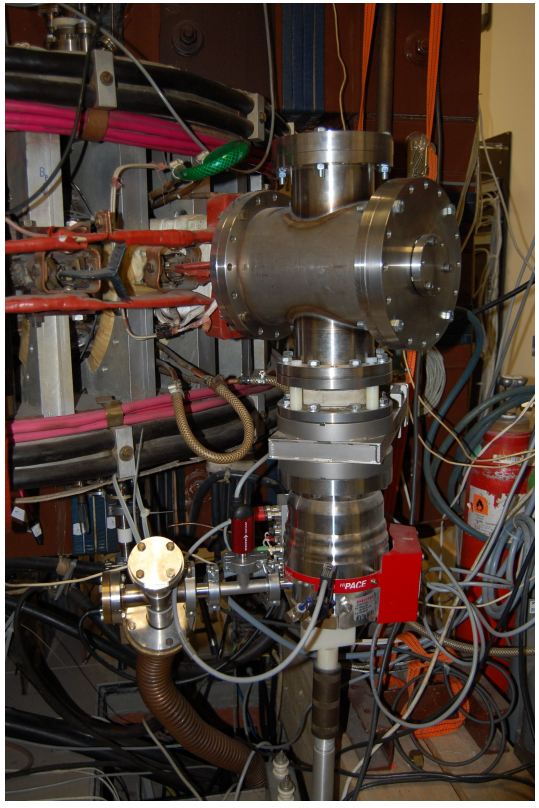
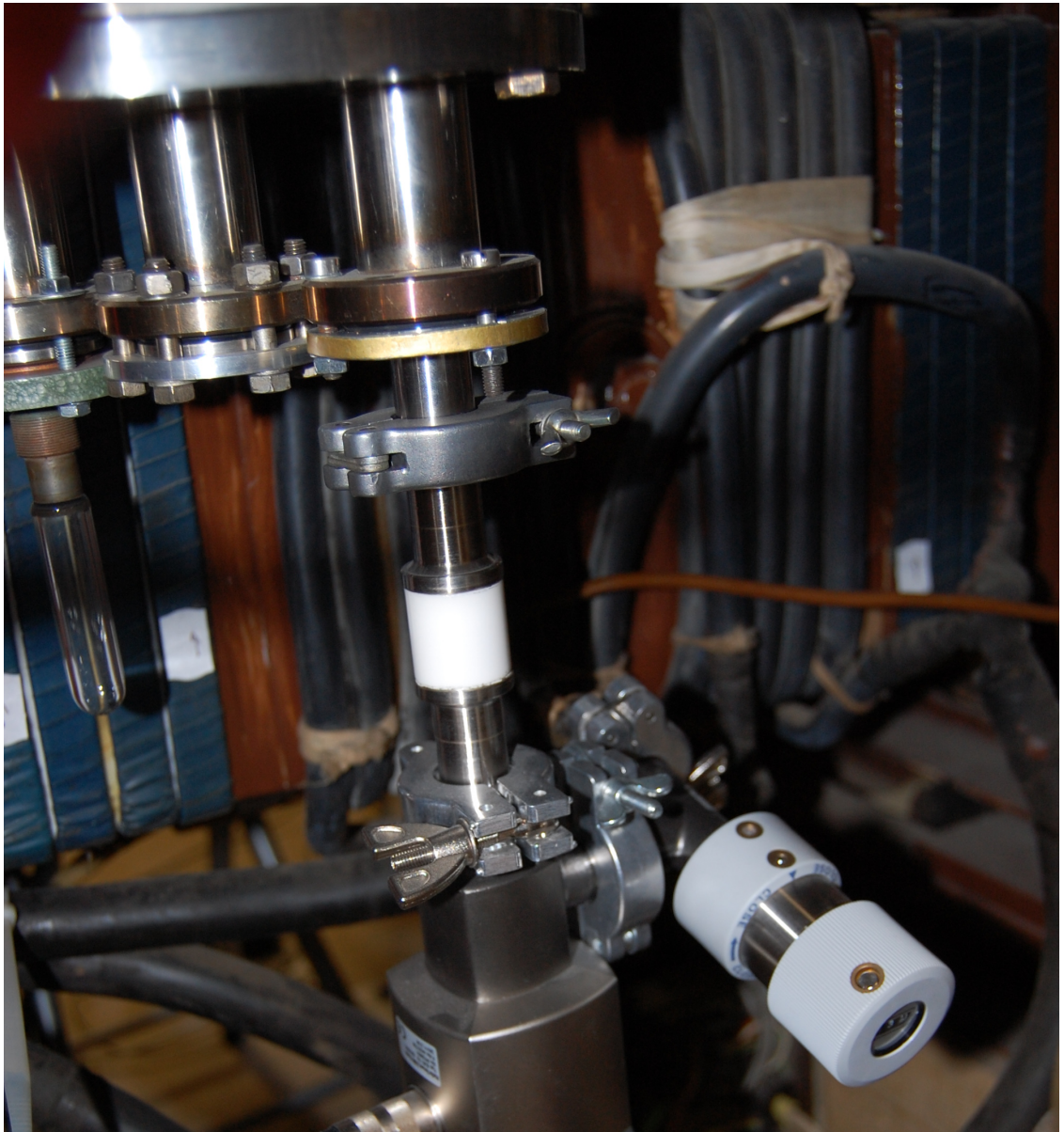
Vacuum - pumping



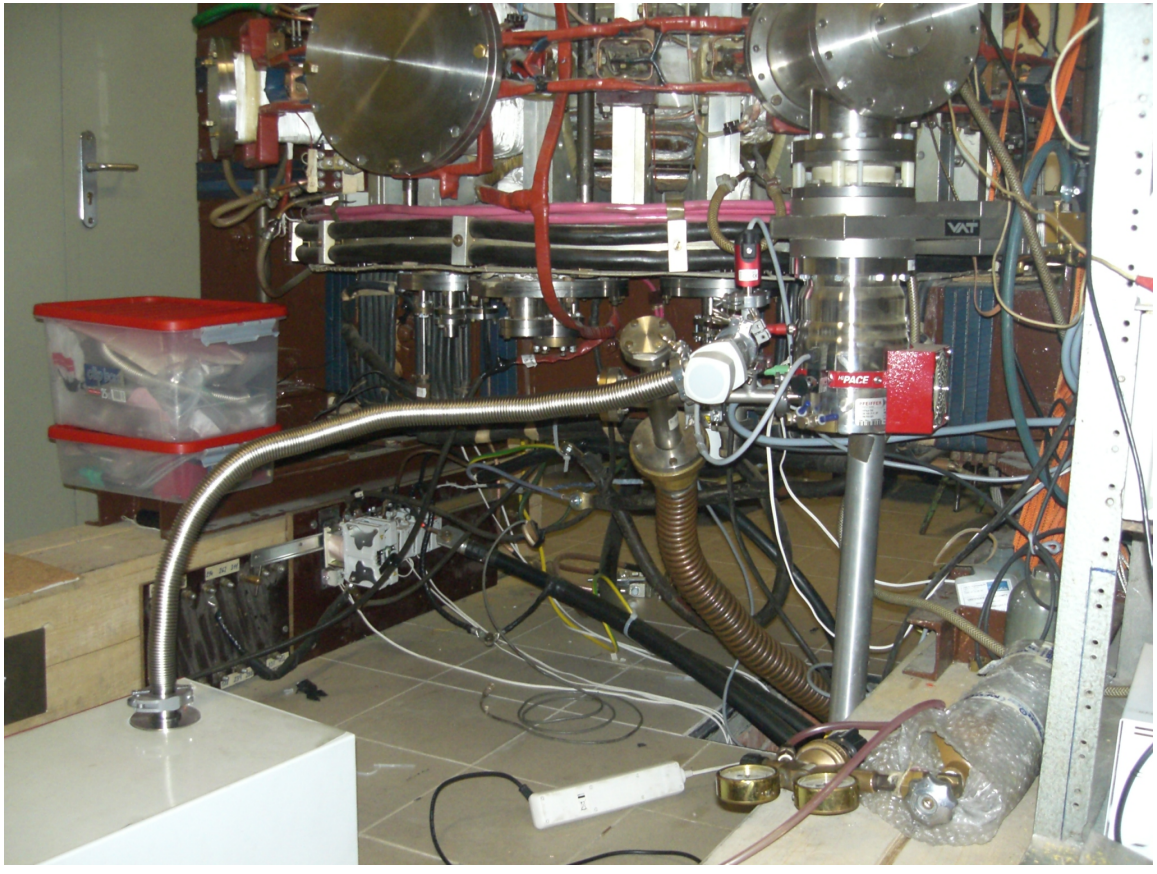


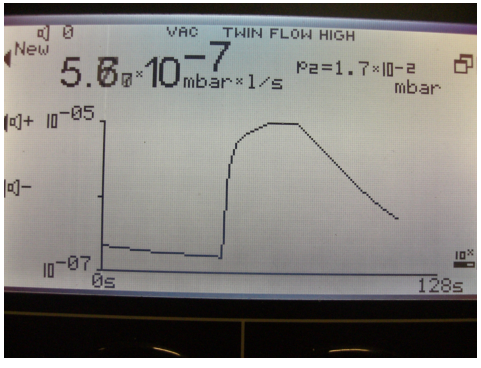
- Problem to reach desired vacuum pressure $\approx 10^{-4}$ Pa.
- April: He leak detector.

Gas filling system



April 2010 - He leak detector





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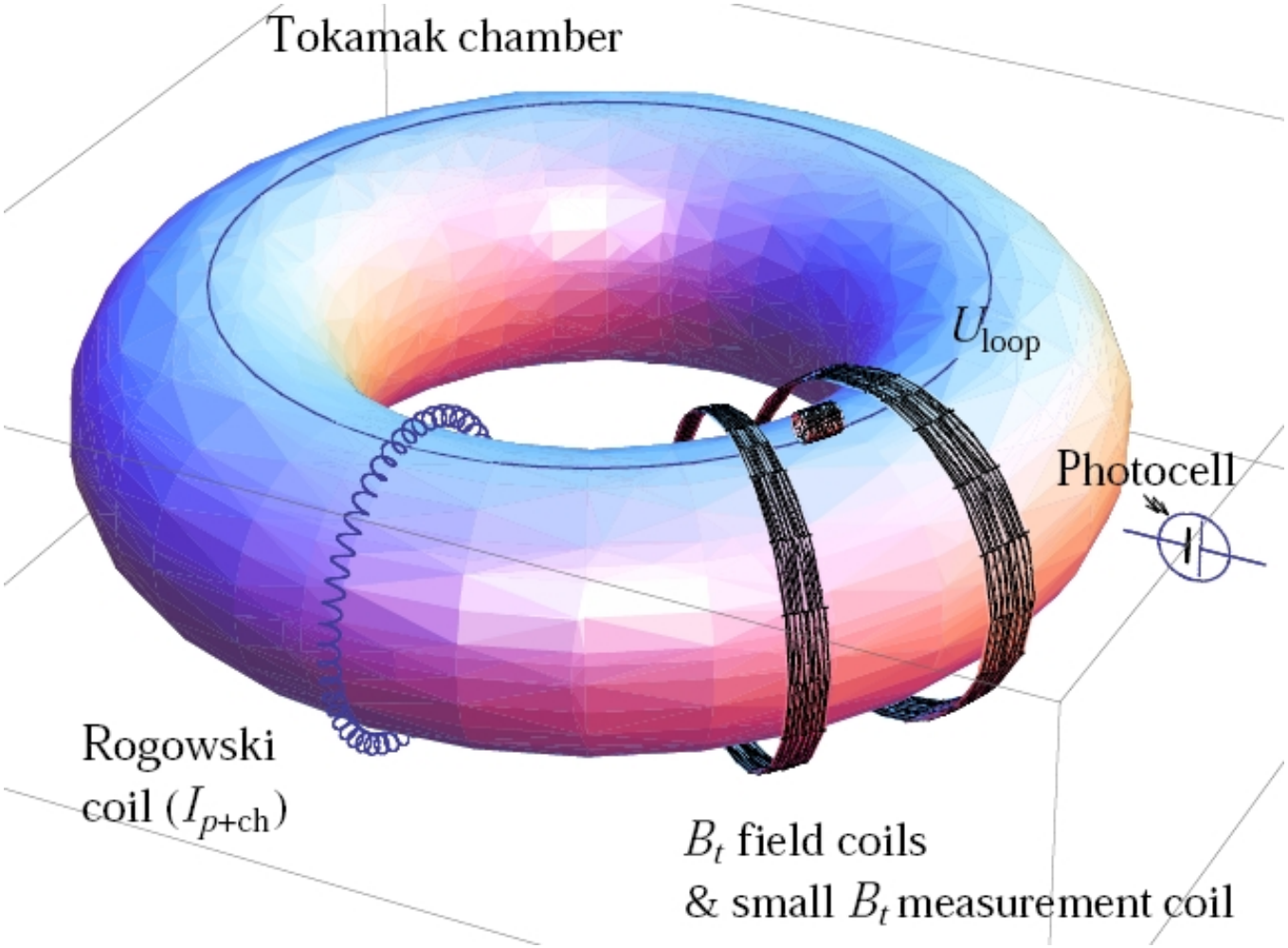
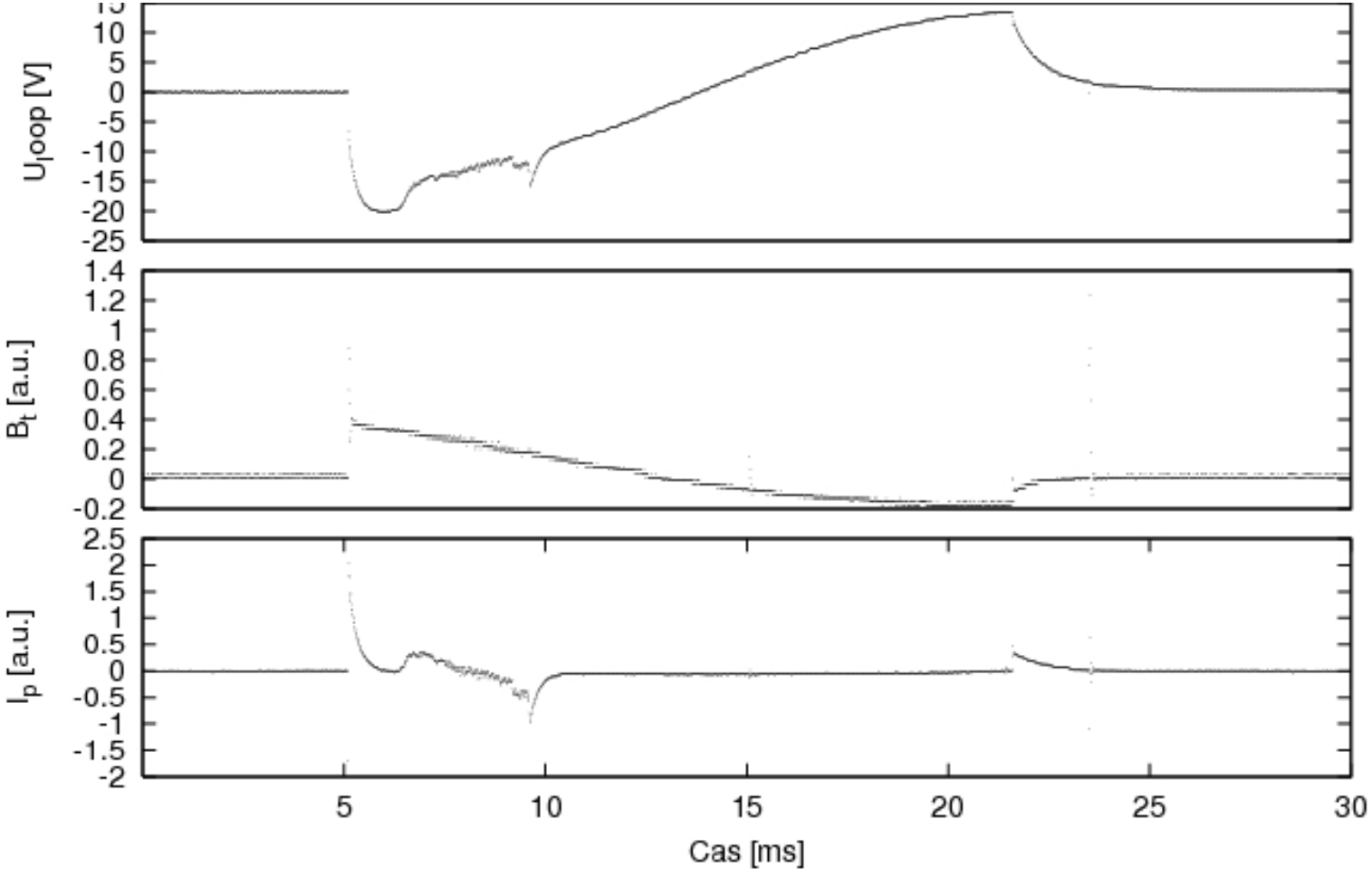
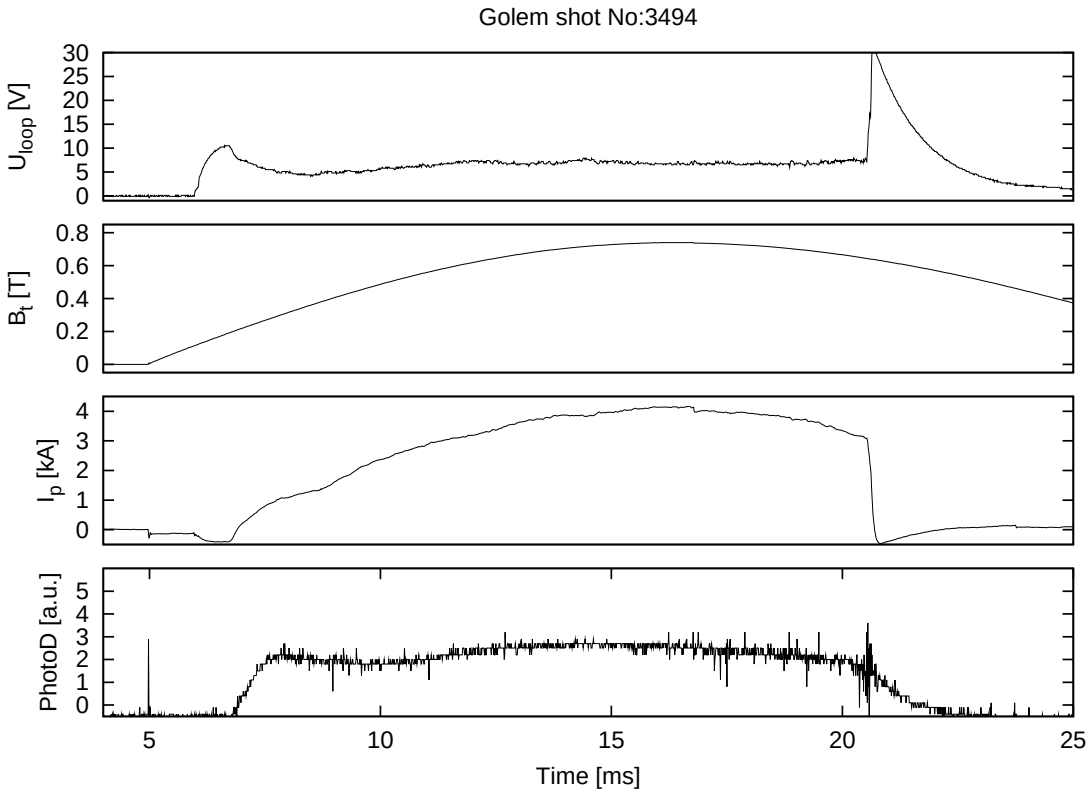
Diagnostics



9^{th} July 2009: Golem first tokamak plasma



Basic diagnostics 2010 (made by SUMTRAIC 2010)



Tomáš Odstrčil

Magnetic measurement

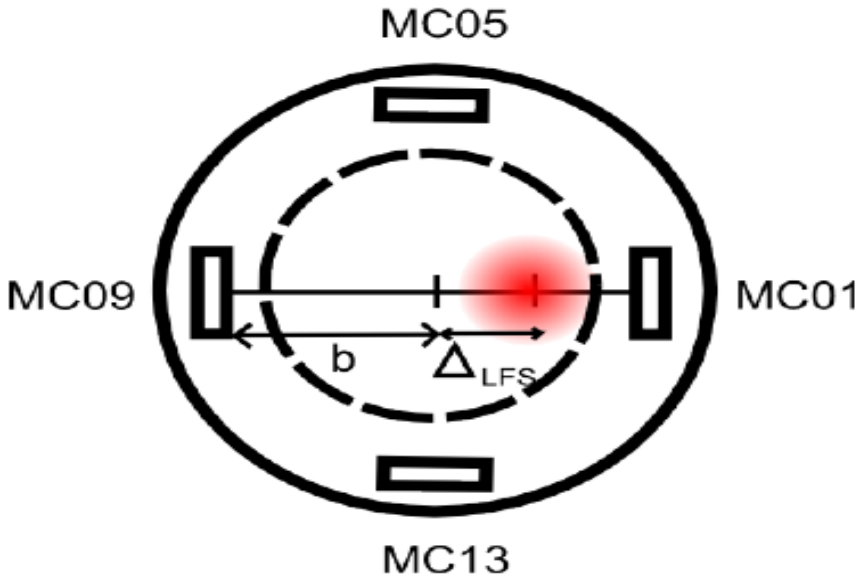


Figure 6.1: Position shift of plasma column (depicted as circle inside of liner) towards low-field side. Dashed circle represents limiter. b denotes distance from center of liner to Mirnov coils and Δ_{LFS} is shift itself. $MC01$ - $MC13$ denote Mirnov coils, where $MC01$ measures magnitude of magnetic field induction B_1, $MC05$ measures B_5, $MC09$ measures B_9 and $MC13$ measures B_{13}.

Tomáš Markovič

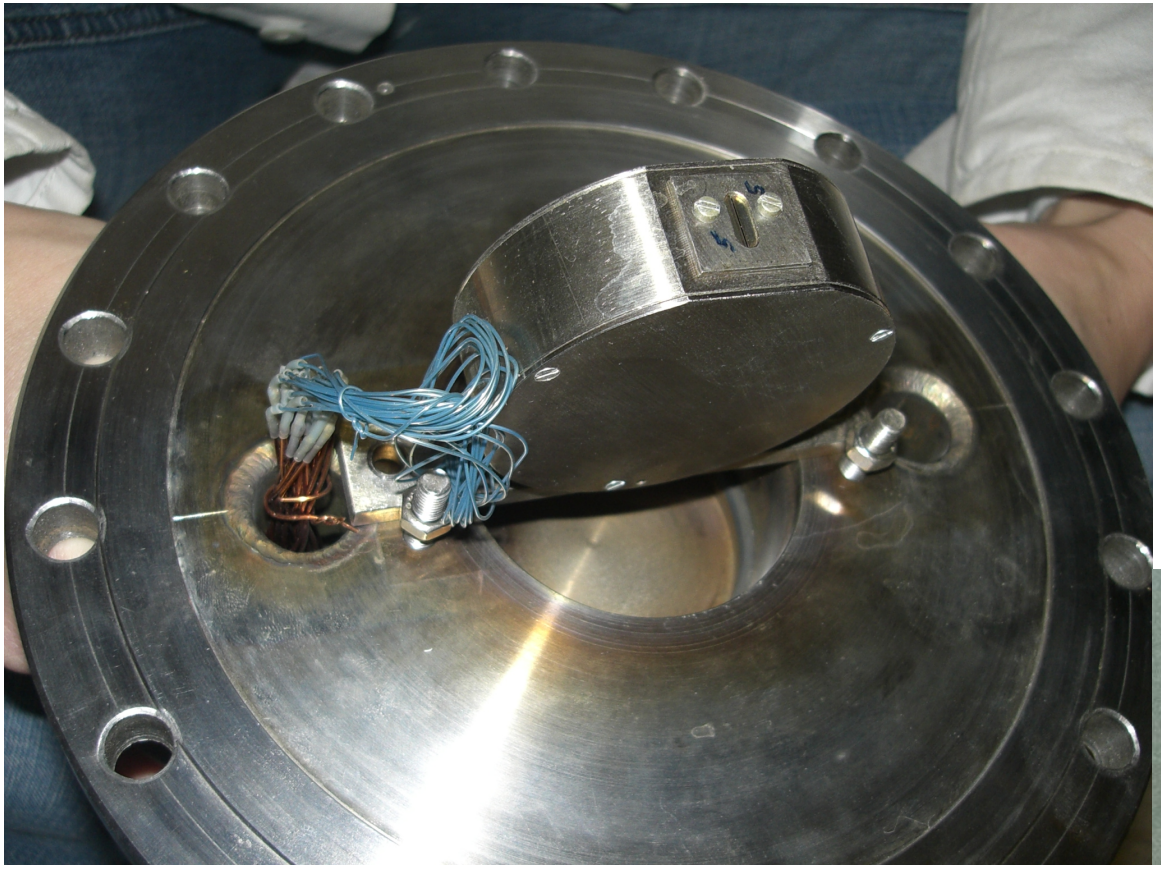
Discharge photo

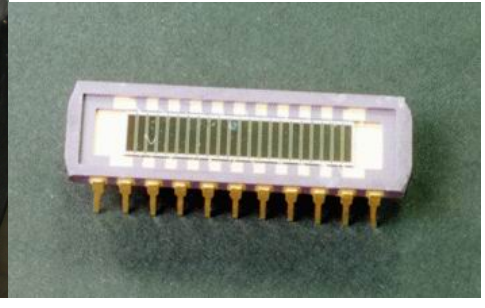
Vojtěch Malý

Fast camera Casio EXILIM FX1

Michal Odstrčil

Bolometers

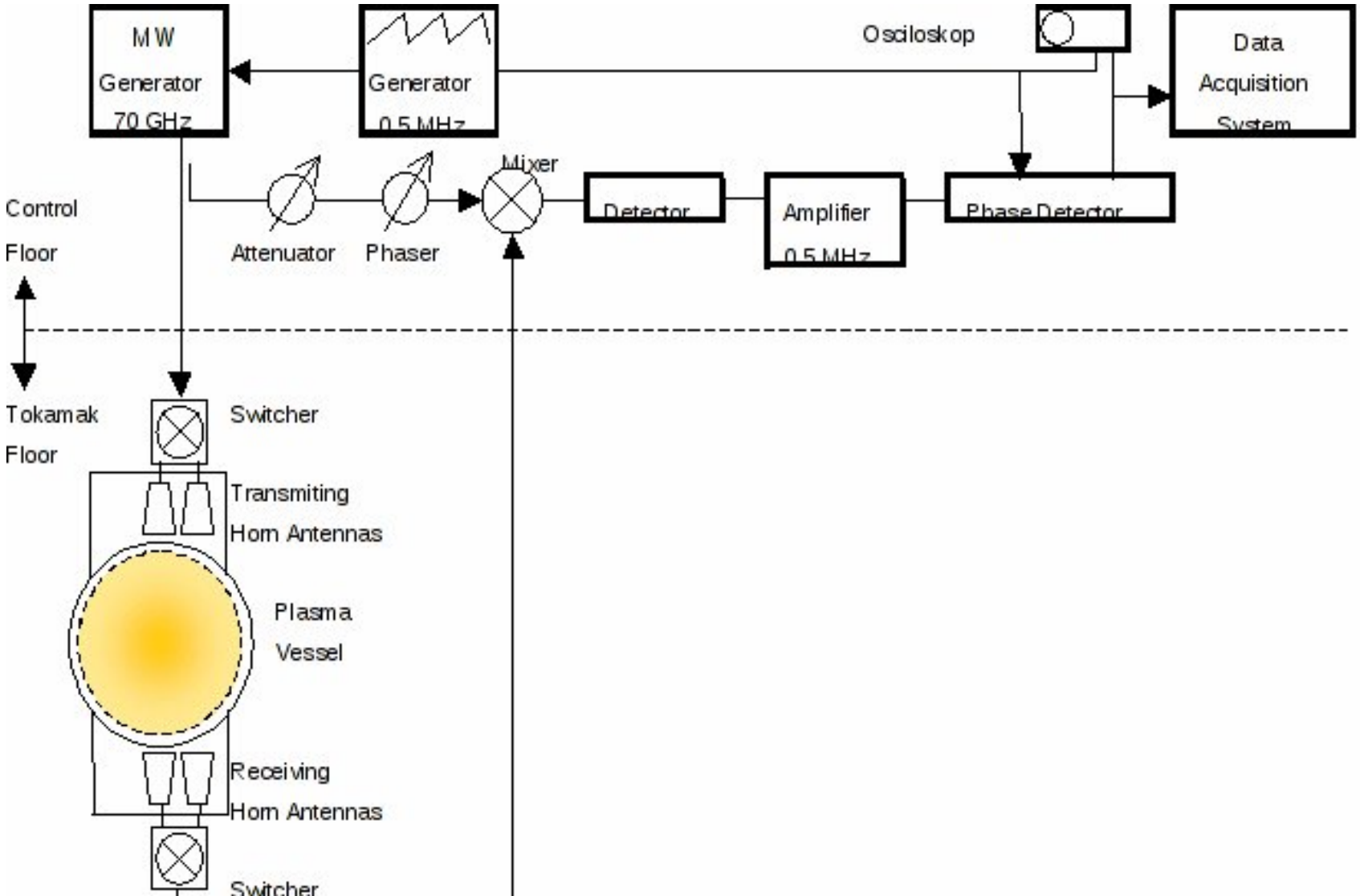




Michal Odstrčil, Edita Dufková

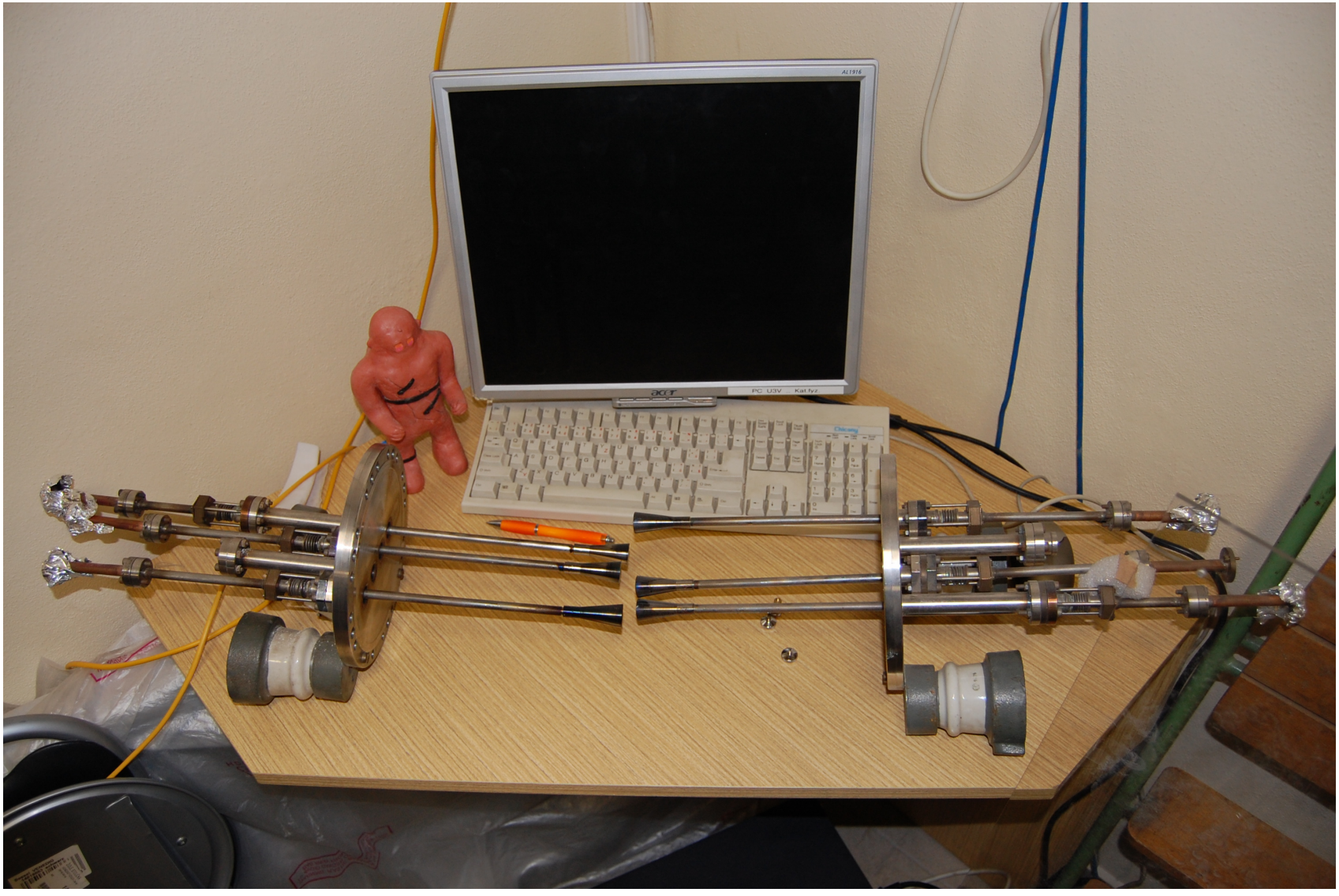
Interferometry - experimental setup

Density measurement



Interferometry - general overview

Density measurement - horn antennas



Density measurement - calibration

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Path to science - Density measurement (interferometry)

- Adam Schindlery a Ondřej Grover.

Bachelor Thesis

- Tomáš Markovič: Magnetic Field Configurations and Their Measurement on Tokamak GOLEM.
- Jindřich Kocman: Feed-back control of the plasma position on the GOLEM tokamak.

SUMTRAIC 2010

December 2010 - Global Tokamak Experiment

38 students, 10 countries, 80 discharges, 4 hours of operation.

iter the way to new energy

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Announcements

38th International Conference on Plasma Science (ICOPS) - Second Announcement

15th International Conference on Fusion Reactor Materials (ICFRM-15),

Links

"InterFaces "

"Worldwide Fusion Links"

"ITER on Facebook"

"ITER on YouTube"

Conferences

17 Feb - 21 Feb, 2011
AAAS - Science Without Borders
Washington, USA

09 May - 13 May, 2011
13th PFMC Workshop / 1st FEMaS Conference
Rosenheim, Germany

15 May - 19 May, 2011
15th International Conference on Emerging Nuclear Energy Systems
San Francisco, California, USA

iter newsline

03 Dec, 2010 - #156

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Fusion World

Launch of the world's first global tokamak experiment

CCFE PhD student Billy Huang has set up a website for the world's first global tokamak experiment, which began today. The project allows anyone in the world with a physics background and internet access to apply to have a go at running shots on the GOLEM tokamak in Prague, a machine that has been made remotely operable by Tokamak Engineer Dr Vojtech Svoboda and his team.

"The Tokamak Global Experiment is an innovative project that gives participants the opportunity to change real parameters on a real machine, from anywhere in the world," said Billy Huang (pictured right). "Our goal with this project is to get people participating and interested in fusion research around the globe."

GOLEM is one of the oldest tokamaks in the world, originating from Russia. Although not nearly as large as JET, GOLEM still produces small amounts of fusion energy and is used as an educational device.

Promotion of this initiative, which is run in conjunction with the Institute of Plasma Physics of the Czech Republic and the Czech Technical University, is mainly targeted at university level physics students, but anyone with a physics background is welcome to register to run an experiment (see http://tokamakglobal.com/). On its debut day, the experiment was a success and received 37 applications from ten countries. The organisers plan to run more sessions in the future.

Delighted with this response to the project, Billy Huang said:
"It's been a real challenge setting up the website, but to have so many people from countries across the world already participating in real live fusion experiments is great."

Read more about the Culham Centre for Fusion Energy (CCFE) here.

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FUSENET

- 43 kEUR HW.
- 15 kEUR operator.

Conferences

- EPS Dublin
- SOFT Porto, publication in impact?

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Future

- Hunt for a ”best shot“.
- 2nd Fast camera

Acknowledgement

- CASTOR team: Jan Stöckel, František Žáček, Vladimír Weinzettl.
- Lectures: Ondřej Kudláček, Tomáš Šmíd, Tomáš Markovič.
- Diagnostics: Edita Dufková, Tomáš Markovič, Tomáš Odstrčil.
- Plasma maintenance: Jindřich Kocman.
- DAS: Tomáš Odstrčil
- Specific help: National Instruments, Pfeiffer Vacuum.

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