6 Conferences, training and education activities

Participation in the GOTiT Training Course

Mr D. Twaróg participated in the high level course on Gyrokinetic Theory and Numerics, November 3-14, 2008.

The course covered gyrokinetic theory and its application to the core, edge (pedestal), and SOL regions of the plasma. Concepts which were discussed included the following:

- Hamiltonian theory based on Lie transforms, derivation of the gyrokinetic equation and delta-f simplifications
- Gyrofluid derivation from the gyrokinetic starting point. Correspondence between the gyrofluid and Braginski fluid model (by extension, also reduced MHD)
- Energy consistency
- Various numerical techniques in use, essentially dividing between particle and continuum based methods
- Treatment of kinetic resonances

The practical parts of the course (3-4 hrs per day) were carried out on the EFDA ITM Gateway cluster. This part of the course included an introduction to a simple Hasegawa-Wakatani code and practice in solving different kinds of fusion modeling problems with the help of this code.

Participation in the Euratom Fusion Training Scheme: W7-X Superconducting Magnet System: Fabrication and Testing "W7-X SC MAGNETS"

Institutional participants:

i) Associations: IPP, FZJ, FZK, CEA, IPPLM(WUT)
ii) Industry: Babcock Noell, Ansaldo and Tesla

A Ph.D. student at Warsaw University of Technology, Mr. Paweł Czarkowski, is participating in the W7-X SC Magnets Project. He is one out of 4 participants of this Euratom training activity. Each of the participants has his/her own task in the scope of the common topic which is manufacturing/assembling/operation/modeling of fusion reactors' superconducting magnets. The task of Mr Czarkowski consists of modelling of W7-X relevant parts using Finite Element Method. His activities are supervised by tutors from Warsaw University of Technology, more precisely the team also participating in the EURATOM-IPPLM P9 project, and IPP Greifswald – System Engineering department, where Mr. Pawel Czarkowski is an employee.

Presently he continues his activity of modeling assembly and manufacturing problems of the SC magnets support structure in W7-X. His main task is to analyse critical or not-clear issues out of all problems which was found in as-built support structure. Results help division heads to make a decision whether repairing is needed or not, what can save time and money.

Since the start of the project he has spent more-or-less equal time in IPP and WUT, with 3-4 weeks intervals.

Euratom Fusion Training Scheme W7-X SC Magnets Reporting Meeting
was held at the Warsaw University of Technology (WUT)
Faculty of Materials Science and Engineering on May 29/30, 2008

7th Kudowa Summer School "Towards Fusion Energy – Plasma Physics, Diagnostics, Technology"

The 7th in the series of the Kudowa Summer School "Towards Fusion Energy – Plasma Physics, Diagnostics, Technology" was, as in the past years, held in charming Kudowa Zdrój (formerly Bad Kudowa in pre-war Niederschlesien) from 20 to 24 June 2008. This summer school is organized every year by The Association Euratom-IPPLM, National Contact Point Euratom-IPPLM (Institute of Plasma Physics and Laser Microfusion, Warsaw, Poland) and the International Centre for Dense Magnetised Plasmas (ICDMP) in cooperatotion with Czech and Hungary Euratom Associations.

The venue for the Summer School was the Hotel Bristol in Kudowa Zdrój. A total of 13 invited lectures on various aspects of plasma physics and controlled thermonuclear fusion were given in this week. In addition, students attending the school gave 17 oral and 1 poster presentations.

The invited lectures covered general talks on magnetic and inertial confinement, plasma diagnostics, plasma facing components, detailed physical aspects of various fusion devices (stellarators, tokamaks and plasma focus), an overview of research on small tokamak devices, and a glance at the future of magnetic fusion research with overviews on JET and ITER. Lecturers were drawn from fusion research laboratories across Europe, from the European Commission and from leading Plasma Physics Research groups at institutes and universities in Europe.

The students gave very well prepared presentations on their own work, and their talks covered research results from PF-1000 (Plasma Focus 1000, International Centre for Dense Magnetised Plasmas, Warsaw, Poland), Wendelstein 7-X stellarator (Max-Planck Institute for Plasma Physics, Greiswald, Germany), COMPASS tokamak (Institute of Plasma Physics, Prague). In addition talks were given on the reinstallation of the COMPASS tokamak from UKAEA-Culham to IPP Prague, research results from the X-ray crystal spectrometer at JET, theoretical studies in plasma physics at the University of Szczecin and studies on capillary discharges and laser generated pulsed plasmas.

The atmosphere at the summer school was, as every year, very stimulating. As usual when scientists get together, there were many discussions in the breaks on all kinds of topics in plasma physics, but also on more general physics questions, and much "networking" was achieved between friends old and new.

A competition was held for the three best oral presentations given by the students. The quality of the presentations was generally very good, and gave the members of the jury a difficult time to make a final selection. After some discussion, the jury awarded the first prize to Ladislaw Riha (from the Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Physics, Prague, Czech Republic) for his lecture "The research of fast energy ions and neutrons produced by PF for using in transmutation of nuclear waste". The prizes comprised beautiful regional craftwork, and will undoubtedly provide a lasting memory to the prize-winners for their participation in the summer school.