

Second announcement of the “480 WE-Heraeus-Seminar”

on “Active Control of Instabilities in Hot Plasmas”

Physikzentrum, Bad Honnef, Germany. June 16th – 18th, 2011.

1. Goals of the seminar:

In the last ten years many research efforts were devoted to the control of individual MHD stabilities, such as energetic particle modes (EPM), sawteeth (ST), neoclassical tearing modes (NTM), Edge localized modes (ELMs) and resistive wall modes (RWM) in magnetically confined high temperature plasma. However, the consistent simultaneous integration of several or even all those methods for a realistic plasma scenario of fusion machines like ITER becomes more and more important but has not been demonstrated so far.

This seminar aims to bring together the leading scientists from the experimental and the theoretical community in the field of active control of MHD stability. Discussing together and summarizing recent approaches will improve the physics understanding of the various control schemes applied and help to develop a realistic start to integrate methods for active control of instabilities in a tokamak plasma. Another major goal of this seminar is to give young scientists the opportunity to enter an active and growing field of research by interacting with world-leading experts.

2. Language: English

3. Planned talks of the workshop

- **Opening talk (30+10 mins):**

- **I 1.1 MHD instabilities in hot plasmas**

- Dr. Hans Rudolf Koslowski, (h.r.koslowski@fz-juelich.de)

- *Institut für Energie- und Klimaforschung - Plasmaphysik
52425 Jülich, Germany*

- **Invited talks (30+10 mins):**

- **I 1.2 MHD Control on ITER**

- Dr. Guido Huysmans, (Guido.Huijsmans@iter.org)

- *ITER Organization, Building 523/003, POP, Science Division*

- *Route de Vinon sur Verdon - 13115 St Paul Lez Durance – France*

- **I 2.1 Physics of Energy Particle modes**

- Dr. Sergei.Sharapov, (Sergei.Sharapov@jet.uk)

- *EURATOM/CCFE Fusion Association, Culham Science Centre,
Abingdon, Oxon, OX14 3DB, UK*

- **I 2.2 Control of Energy Particle modes**

Dr. Simon Pinches, (simon.pinches@ccfe.ac.uk)
*EURATOM/CCFE Fusion Association, Culham Science Centre,
Abingdon, Oxon, OX14 3DB, UK*

I 3.1 Physics of Sawtooth

Dr. Ian Chapman, (Ian.Chapman@ccfe.ac.uk)
*EURATOM/CCFE Fusion Association, Culham Science Centre,
Abingdon, Oxon, OX14 3DB, UK*

I 3.2 Control of Sawtooth

Dr. Jonathan Graves, (Jonathan.Graves@epfl.ch)
*Association EURATOM-Confédération Suisse, Ecole Polytechnique
Fédérale de Lausanne (EPFL), CRPP, CH-1015 Lausanne, Switzerland*

I 4.1 Physics of Neoclassical Tearing Modes

Dr. Oliver Sauter, (olivier.sauter@epfl.ch)
*Association EURATOM-Confédération Suisse, Ecole Polytechnique
Fédérale de Lausanne (EPFL), CRPP, CH-1015 Lausanne, Switzerland*

I 4.2 Control of Neoclassical Tearing Modes

Dr. Marc Maraschek, (Maraschek@ipp.mpg.de)
*Max-Planck-Institut für Plasmaphysik, EURATOM-Assoziation, D-85748
Garching, Germany*

I 5.1 Physics of Edge Localized Modes

Dr. Howard Wilson, (hw508@york.ac.uk)
University of York, UK

I 5.2 Control of Edge Localized Modes

Dr. Yunfeng Liang, (Y.liang@fz-juelich.de)
*Institut für Energie- und Klimaforschung - Plasmaphysik
52425 Jülich, Germany*

I 6.1 Physics of Resistive Wall Modes

Dr. Valentin Igochine, (valentin.igochine@ipp.mpg.de)
*Max-Planck-Institut für Plasmaphysik, EURATOM-Assoziation, D-85748
Garching, Germany;*

I 6.2 Control of Resistive Wall Modes

Dr. Tommaso Bolzonella, (tommaso.bolzonella@igi.cnr.it)
*Consorzio RFX, Associazione EURATOM-ENEA per la fusione, Padova,
Italy*

I 8.1 Physics of Disruption

Dr. Tim Hender, (Tim.Hender@ccfe.ac.uk)
*EURATOM/CCFE Fusion Association, Culham Science Centre,
Abingdon, Oxon, OX14 3DB, UK*

I 8.2 Control of Disruption

Dr. Michael Lehnen, (m.lehnen@fz-juelich.de)
*Institut für Energie- und Klimaforschung - Plasmaphysik
52425 Jülich, Germany*

- **Summary talk (30+10 mins):**

I 9.1 Integration of active control of instabilities in hot plasmas

Dr. Piero Martin, (piero.martin@igi.cnr.it)

Consorzio RFX, Associazione EURATOM-ENEA per la fusione, Padova, Italy

- **Oral talks (20+5 mins):**

- **O3.3 Active Control of MHD instabilities in HL-2A tokamak**

- Dr. Yi Liu, (yiliu@swip.ac.cn)

- *South Western Institute of Physics, Chengdu, China*

- **O 4.3 Controls of magnetic islands by pellet injection in tokamaks**

- Dr. K C Shaing, (kcs@plasma.pssc.ncku.edu.tw)

- *Institute for Space, Astrophysical and Plasma Sciences, National Cheng Kung University, Tainan 70101, Taiwan, Republic of China*

- **O 4.4 Toroidal Plasma Flow Generated from the Neoclassical Toroidal Plasma Viscosity in Tokamaks**

- Dr. Y Sun, (y.sun@fz-juelich.de)

- *Institut für Energie- und Klimaforschung - Plasmaphysik
52425 Jülich, Germany*

- **O 5.3 ELM control in TCV**

- J Rossel (jonathan.rossel@epfl.ch)

- *Ecole Polytechnique Fédérale de Lausanne (EPFL), Centre de Recherches en Physique des Plasmas (CRPP), Association Euratom Confédération Suisse, Station 13, CH-1015 Lausanne, Switzerland*

- **O 5.4 Transport Driven by Resonant Magnetic Perturbations**

- Dr. F. L. Waelbroeck, (flw@mail.utexas.edu)

- *Institute for Fusion studies, Univ. Texas, Austin Texas 78712, USA*

- **O 5.5 Modelling of ELM with a current relaxation model**

- J Pearson, (j.pearson@fz-juelich.de)

- *Institut für Energie- und Klimaforschung - Plasmaphysik
52425 Jülich, Germany*

- **O 6.3 Improved feedback control of MHD instabilities and error fields in the RFX-mod RFP and DIII-D tokamak experiments**

- L. Piron, (lidia.piron@igi.cnr.it)

- *Consorzio RFX, EURATOM-ENEA Association, Padova, Italy*

4. POSTERS

P1: Dr Nizar Ben Ayed,

TAE Studies in the MAST tokamak

P2: Matteo Baruzzo,

RWM rigidity studies on RFX-mod with a limited set of active coils experimental results and closed loop control modeling

P3: Zhirui Wang,

Progresses in understanding the physics of Resistive Wall Mode and its feedback control in Reversed Field Pinch

P4: Michael Rack,

Thermoelectric currents and their role in edge localized mode formation in the JET tokamak

P5: Bircan Ayten,

Dynamics of Tearing Mode Stabilization

P6: Nadine Baumgarten,

Disruption Mitigation and Runaway Electron Suppression with the help of Massive Gas Injection

P7: Tao Zhang,

Influence of Resonant Magnetic Perturbation Field on Plasma Rotation

P8: Yao Yang,

Observations of Plasma Response to RMP on TEXTOR

P9: Christopher Wiegmann,

3D MHD Equilibrium Calculations for Tokamaks with the HINT2 Code

5. **Housing Accommodation.**

The accommodation and meals of all participants will be funded by the WE-Heraeus foundation. For details see www.pbh.de.

It is suggested for participants arrive on the afternoon of the 15th of June 2011.

6. **Scientific Chairman:**

Prof. Dr. Yunfeng Liang

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7. **Secretary:**

Mr. Jonathan Pearson

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Agenda:

It is suggested for participants arrive on the afternoon of the 15th of June 2011.

June 15 th	Arrive		Dinner			
June 16 th	Session 1: Opening (Chair: Y Liang)	Time	Speakers		Duration (mins)	
		8:55	D Reiter	Welcome and remarks	5	
		9:00	HR Koslowski	I 1.1	40	
		9:40	G Huysmans	I 1.2	40	
		10:20		Coffee	25	
	Session 2: EPM (P Martin)	10:45	S Sharapov	I 2.1	40	
		11:25	S D Pinches	I 2.2	40	
		12:05		Lunch		
	Session 3: ST (HR Koslowski)	14:00	I Chapman	I 3.1	40	
		14:40	J Graves	I 3.2	40	
		15:20	Yi Liu	O 3.3	25	
		15:45		Coffee	25	
	Session 4: NTM (T Donne)	16:10	O Sauter	I 4.1	40	
		16:50	M Maraschek	I 4.2	40	
		17:30	K C Shaing	O 4.3	25	
		17:55	Y Sun	O 4.4	25	
		18:20		Dinner		
June 17 th	Session 5: ELM (D Reiter)	9:00	H Wilson	I 5.1	40	
		9:40	Y Liang	I 5.2	40	
		10:20		Coffee	25	
		10:45	J Rossel	O 5.3	25	
		11:10	F L Waelbroeck	O 5.4	25	
		11:35	J Pearson	O 5.5	25	
		12:00		Lunch		
	Session 6: RWM (T Hender)	14:00	V Igochine	I 6.1	40	
		14:40	T Bolzonella	I 6.2	40	
		15:20		Coffee	25	
		15:45	L Piron	O 6.3	25	
	Session 7: Poster	16:10		Posters	125	
18:15			Conference Dinner			

June 18th	Session 8: Disruption (H Wilson)	9:00	T Hender	I 8.1	40
		9:40	M Lehen	I 8.2	40
		10:20		Coffee	25
	Session 9: Discussion (K H Spatschek)	10:45	P Martin	I 9.1	40
		11:25		Discussion	60
		12:25		Lunch	
			Close		