Transport in Fusion Plasmas: Transport Barrier Physics

10th EU-US TRANSPORT TASK FORCE WORKSHOP

Villa Monastero, Varenna, Italy
September 6 - 9, 2004

PROGRAMME

Monday Sept. 6

8:30 - 8:40	J. Connor	Welcome

Transport Barriers. Chair: G. Tynan

8:40 - 9:10	C. Hidalgo	Critical issues in transport barriers - an experimentalist's perspective.
9:10 - 9:25	G. Tynan	Discussion
9:25 – 9:55	T. S. Hahm	Critical issues in transport barriers - a theoretician's perspective.
9:55 – 10:20	A. Rogister	Discussion
10:20 - 10:40	Coffee Break	

ITB Physics. Chair: X. Garbet

10:40 - 11:05	A. Peeters (presented by C.Angioni)	Progress in understanding ITBs in ASDEX-Upgrade.
11:05 - 11:30	O. Sauter	Is zero or negative shear responsible for eITBs formation and or eITBs steady-state performance?
11:30 - 11:55	Yu. Baranov	Effect of hysteresis in JET ITB plasma with LHCD
11:55 - 12:20	K. Toi	Formation of internal transport barrier and electrostatic fluctuations in almost-dimensionally-similar low temperature plasmas of CHS Heliotron/Torsatron
12:20 - 14:00	Lunch	

ITB Physics. (Continue) Chair: X. Garbet

14:00 - 14:35	G. Tynan	Basic experimental studies of shear layer formation in magnetized plasmas.
14:35 - 14:55	X. Garbet	Discussion

H-mode and momentum transport Physics. Chair: V. Naulin

14:55 - 15:30	J. Rice	The dependence of core rotation on magnetic configuration and the relation to the H-mode power threshold in Alcator C-Mod Plasmas with no momentum input.
15:30 - 16:00	Y. Andrew	L-H transition studies on JET.
16:00 - 16:30	Y. Hamada	Experimental study of zonal flow in the JIPP T-IIU tokamak plasmas.
16:30 – 16:50	Coffee Break	
16:50 - 17:20	F. Crisanti	Experimental evidence of ion internal transport barriers without injection of external momentum input.
17:20 - 17:50	V. Naulin	Discussion

Density Limit and general issues. Chair: J. Rice

17:50 - 18:20	M. Tokar	The role of anomalous transport, radiation and plasma-wall interaction in the density limit.
18:20 - 18:50	B. Unterberg	Physical mechanism of confinement transitions from low - to radiative improved mode in TEXTOR and extrapolation to future devices.

Tuesday Sept. 7

Density Limit and general issues (Continue). Chair: J. Rice

8:30 - 9:00	A. Rogister	Enhanced Dα confinement mode: a theoretical model.
9:00 - 9:30	N. Vianello	Dynamical self-organization process between turbulence and plasma flow in a reversed field pinch configuration.
9:30 - 10:00	J. Rice	Discussion
10:00 - 10:20	Coffee Break	

Particle and Heat Pinches. Chair: X. Garbet

10:20 - 11:00	P. Mantica	Particle and heat Pinches in Tokamaks.
11:00 - 11:25	C. Angioni	Transition from TEM to ITG and consequences on transport properties in AUG plasmas.
11:25 - 11:50	J. Candy	Turbulent particle transport in tokamaks.
11:50 - 12:15	P.W. Terry	Particle pinch induced by nonlinear damping in collisionless trapped electron mode turbulence.
12:15 - 12:40	G.T. Hoang	Parametric dependence of turbulent particle transport in Tore Supra Plasmas.
12:40 - 14:30	Lunch	

Particle and Heat Pinches. (Continue) Chair: X. Garbet

14:30 - 14:50	M. Valisa	Simultaneous evaluation and comparison of impurity, deuterium and electron heat transport in L and H mode in JET plasmas.
14:50 - 15:20	X. Garbet	Discussion.

Turbulence and Transport. Chair: J. Connor

15:20 - 15:45	F. Imbeaux	Transport modeling of hybrid discharges from the ITPA profile database.
15:45 – 16:05	L. Marrelli	Transition to quasi single helicity in the reverse field pinch.
16:05 – 16:30	Coffee Break	
16:30 – 16:50	W. Nevins	Time scales in ITG turbulence.
16:50 - 17:10	U. Stroth	ρ_s scaling of drift-wave turbulence in a toroidal low-temperature plasma.
17:10 - 18:40	Poster Session	

Wednesday Sept. 8

Electron and Transient Transport. Chair: O. Sauter

8:30 - 9:00	D. Mikkelsen	Theoretician's point of view.
9:00 - 9:30	J. Callen	Paleoclassical electron heat transport.
9:30 - 10:00	F. Jenko	Heat and particle transport due to coupled TEM-ITG turbulence.
10:00 - 10:30	Coffee Break	

Chair: J. DeBoo

10:30 - 11:00	U. Stroth	Experimentalist's point of view.
11:00 - 11:25	Y. Camenen	Influence of plasma triangularity on electron heat transport in EC heated TCV L-mode plasmas.
11:25 - 11:45	M. de Baar	Critical gradient and electron thermal transport in TEXTOR L-mode plasmas.
11:45 - 12:05	K. Gentle	Electron thermal transport in tokamaks: complex dependence of flux gradients.
12:05 - 12:25	A. Jacchia	Nonlinear pertubative electron heat transport Study in ASDEX-Upgrade tokamak.
12:25 - 14:15	Lunch	

Electron and Transient Transport. (Continue) Chair: K.W. Gentle

14:15 - 14:35	E. Min	Reduced Turbulent Transport after ECRH switch-off in T-10 and TEXTOR: Experiment and simulations.
14:35 – 14.55	J. DeBoo	Transport studies in DIII-D with modulated ECH.
14:55 - 15:20	F. Ryter	Investigation of TEMs in ASDEX upgrade: threshold and stabiilsation by collision.
15:20 - 15:40	X. Garbet	Interplay Between Electron and Ion Heat Channels.
15:40 – 16:40	F. Ryter	Discussion
16:40 - 17:00	Coffee Break	
17:00 - 18:30	Poster Session	

Thursday Sept. 9

Electrostatic and Electromagnetic Plasma Turbulence and Transport. Chair: M.Romanelli

8:30 - 9:00	F. Jenko	Overview of theoretical results on electrostatic and electromagnetic turbulence driven transport.
9:00 - 9:20	P.W. Terry	Open issues on theoretical and numerical prediction of turbulent transport.
9:20 - 9:40	D. Mikkelsen	Gyrokinetic simulations of turbulence in NSTX.
9:40 - 10:00	A. Eriksson	Electromagnetic particle pinch due to toroidal drift waves.
10:00 - 10:30	Coffee Break	
10:30 - 10:50	T.S. Hahm	Theory on simulation of turbulence spreading.
10:50 - 11:15	B. Labit	Investigations of electrostatic turbulence on the TorPEx device.
11:15 - 11:35	V. Naulin	Zonal flow generation mechanism in drift-Alfven turbulence.
11:35 - 12:00	S. Kubota	Turbulence radial correlation length in NSTX.
12:00 - 12:55	M. Romanelli	Discussion.

End of the Workshop

Tuesday posters.

P1 Microstability analysis of FTU ITB plasmas.
G. Regnoli

P2 On electron transport barriers.
A.Rogister

P3 Influence of Ip on the Formation and Control of eITBs in EC-Heated plasmas in TCV.
R. Behn

P4 On the energy transfer between flows and turbulence in the plasma boundary of fusion devices.
B. Gonçalves

P5 Effect of transport changes by DC and AC operation of dynamic ergodic divertor on the MARFE density limit in TEXTOR.
F. Kelly

P6 Suppression of drift instabilities at the plasma edge by the particle flow along stochastic field lines.
X. Loozen

P7 One-dimensional modeling of neutral transport in H-mode pedestal region.
D. Mossessian

P8 Modelling of the edge transport barrier with the code RITM.
Kalupin

P9 Impact of alfa on the microstability of internal transport barriers.
C. Bourdelle

P10 Dynamics of and fluctuations during H-modes in NSTX.
C. Bush

P11 Electromagnetic particle pinch due to toroidal drift waves.
A. Eriksson

P12 Effects of edge ergodization induced by DED on turbulence and particle transport in TEXTOR.
S. Jachmich

P13 Dynamics of sheared flows development and coupling with an increasing in

the level of turbulence in the TJ-II stellarator.
C. Hidalgo

Wednesday posters.

P1 Critical gradients and electron thermal transport in TEXTOR L-mode plasmas.
M. de Baar

P2 Electron thermal transport in tokamaks: complex dependence of flux on gradient.
K. Gentle

P3 Non-linear pertubative electron heat transport study In ASDEX-Upgrade tokamak.
A. Jacchia

P4 Transport studies in DIII-D with modulated ECH.
J. DeBoo

P5 Reduced turbulent transport after ECRH Switch-off in T-10 and TEXTOR: experiments and simulations.
E. Min

P6 Investigation of TEMs in ASDEX Upgrade: threshold and stabilisation by collisions.
F. Ryter

P7 Interplay between electron and ion heat channels.
X. Garbet

P8 Transport studies with (modulated) ECRH in TEXTOR DED plasmas.
Hogeweij D.

P9 Kolmogorov-Kraichnan scaling in the Inverse energy cascade of two-dimensional plasma turbulence.
G. Antar

P10 On the origin of intermittency in the scrape-off layer of magnetic confinement devices.
G. Antar

P11 Millimeterwave imaging diagnostic for temperature and density fluctuation measurements on the TEXTOR tokamak.
I.J. Classen

P12 Magnetic field and machine size scaling of particle transport and the underlying complex turbulence dynamics in LAPD.
N. Crocker

P13 Three-dimensional turbulent structures in the TJ-K torsatron.
N. Mahdizadeh

P14 Diffusivity induced by vortex-like coherent structures in reversed field pinch plasmas.
M. Spolaore

P15 Density fluctuations measurements by reflectometry on tore supra.
L. Vermare

P16 Applications of velocity inference techniques to simulations of plasma turbulence.
C. Holland

P17 On ion temperature gradient (ITG) and parallel velocity shear (PVS) instabilities.
A. Rogister

P18 Large larmor radius effects in turbulent plasmas.
M. Vlad

P19 Generation of coherent flow from the fluid's helicity via sphaleron transitions.
F. Spineanu

P20 Influence of plasma triangularity on electron heat transport in ECH heated TCV L-mode plasmas.
Y. Camenen