

Contents

Plenary Talks

PL-01	U. Stroth	The physics of flows and turbulence in fusion plasmas	1
PL-02	K. Kusano	Competition and synergy of macro-and micro-scale physics	6

Review Talk

R-01	Y. Takeiri	Recent development in the operational regime of Large Helical Device toward a steady-state helical fusion reactor	11
-------------	------------	---	----

Tutorial Talks

T-01	J.N.Talmadge	Transport in a quasisymmetric plasma: Results from HSX	19
T-02	K.Ida	Inter-linkage of transports and its bridging mechanism	28

Invited Talks

I-01	E. Ascasibar	Effect of rotational transform and magnetic shear on confinement	35
I-02	B.D. Blackwell	Alfvén range instabilities in H-1 -characterisation, mode structure, and relation to rational surfaces	41
I-03	L.M. Kovrizhnykh	Stability and variation of plasma parameters in the L-2M stellarator by exciting induction current in ECR heated plasma	42
I-04	R. Sakamoto	Properties of internal diffusion barrier in high density plasmas on Large Helical Device	48
I-05	N. Asakura	Influence of X-point on scrape-off layer plasma and H-mode transition in tokamaks	
I-06	Y. Feng	Comparative divertor-transport study for W7-AS and LHD	54

I-07	M. Kobayashi	On transport characteristics of the edge ergodic layer of LHD	60
I-08	H. Sugama	Gyrokinetic studies of ion temperature gradient turbulence and zonal flows in Helical Systems	66
I-09	H.E. Mynick	Zonal flows in 3-D toroidal confinement systems	72
I-10	R. Matsumoto	Global simulations of turbulence and dynamos in differentially rotating astrophysical plasmas	78
I-11	M.G. Shats	Suppression of turbulence by mean flows in two-dimensional fluids	79
I-12	S. Inagaki	Transport dynamics and multi-scale coupling of turbulence	85
I-13	K.Y. Watanabe	Confinement study on the reactor relevant high beta LHD plasmas	90
I-14	R. Sanchez	SIESTA: an Scalable Island Equilibrium Solverfor Toroidal Applications	96
I-15	M. Yoshida	Physics mechanisms of toroidal rotation profile and properties of momentum transport in JT-60U	97
I-16	P. Garabedian	Theory of stellarators and tokamaks in three dimensions	103
I-17	K. Nagasaki	ECCD experiments in Heliotron J, TJ-II, CHS and LHD	109
I-18	K.J. McCarthy	Comparison of impurity transport in different magnetic configurations	115
I-19	A. Fujisawa	Zonal flows and fields generated by turbulence in CHS	121
I-20	F.Tabarés	Impact of lithium-coated walls on plasma performance in the TJ-II stellarator	127
I-21	C.D.Beilder	Transport modeling for W7-X on the basis of W7-AS experimental results	133
I-22	A. Sagara	Design Integration toward Optimization of LHD-type Fusion Reactor FFHR	139
I-23	M.C. Zarnstorff	Evolutionary development of an ignited toroidal fusion reactor	145

Oral Presentations

O-01	S.F. Knowlton	Stability of current-driven discharges in the Compact Toroidal Hybrid Helical Experiment	147
O-02	T. Mizuuchi	Studies of configuration control effects on dynamic behavior of Heliotron J plasmas	148
O-03	A. Pedrosa	Experimental studies and modelling of edge shear flow development in the TJ-II stellarator	154
O-04	Y. Xu	Overview of flow and turbulence studies on TEXTOR	158
O-05	F. Castejon	Searching for a flux-expansion divertor in TJ-II	162
O-06	K. Itoh	Nonlinear competition between zonal flows and geodesic acoustic modes	166
O-07	W. Guttenfelder	Modeling of anomalous transport in ECRH Plasmas at HSX	167
O-08	T. Oishi	Bispectral analysis of harmonic oscillations measured using beam emission spectroscopy and magnetic probes in CHS	171
O-09	T. Kaneko	Effects of superimposed parallel and perpendicular flow velocity shears on drift-wave instabilities in magnetized plasmas	175
O-10	V.I. Maslov	Strong shear formation by poloidal chain of magnetic islands	179
O-11	K. Nagaoka	Ion heating experiments using perpendicular neutral beam injection in the Large Helical Device	183
O-12	M. Yoshinuma	Observation of toroidal flow on LHD	187
O-13	B.H. Neilson	Status of the NCSX project	191

Poster Presentations 1

P1-001	Y. Hasebe	Impact of dynamic ergodic divertor on plasma rotation in the small tokamak HYBTOK-II	193
P1-003	N. Kasuya	Geodesic acoustic mode with the existence of a poloidal shock structure	197
P1-004	M. Rajkovic	A comparison of intermittency in neutral fluids and magnetically confined plasmas	201
P1-005	M. Sasaki	GAM eigenmode in multi-ion system	205

P1-006	A. Ando	Generation of supersonic and super-Alfvénic flow by using ICRF heating and a magnetic nozzle	209
P1-007	M. Ramisch	Investigation of plasma turbulence in strongly sheared E×B flows using multiprobe arrays	213
P1-008	Y. Kawai	Cascade process of two-dimensional turbulence observed in magnetized pure electron plasmas	217
P1-009	K. Ogiwara	Neutral flow measurement using a tunable diode laser	221
P1-010	V.P. Budaev	Scaling laws of intermittent plasma turbulence in edge of fusion devices	225
P1-011	S. Tamura	Instability of thin-walled annular beam in dielectric-loaded cylindrical waveguide	229
P1-012	T. Yamada	Spatiotemporal behavior of drift waves in LMD-U	233
P1-013	T.S. Pedersen	Confinement and dynamics of electron-rich plasmas in the Columbia Non-neutral Torus	237
P1-014	S. Yoshimura	Viscosity estimation utilizing flow velocity field measurements in a rotating magnetized plasma	238
P1-015	T. Asai	Spatial distribution of toroidal flow in a field reversed configuration	242
P1-016	D. López-Bruna	Modification of transport due to low order rationals of the rotational transform in ECH plasmas of the TJ-II Heliac	245
P1-017	T. Takahashi	Effects of Coulomb collisions on the toroidal spin-up of a field-reversed configuration	246
P1-018	T. Onchi	Observation of helical structure with a fast camera in a low-aspect ratio RFP "RELAX"	250
P1-019	J.A. Alonso	Fast imaging of edge plasma instabilities in the TJ-II stellarator and JET tokamak.	254
P1-020	N. Nishino	Measurement of peripheral plasma turbulence using a fast camera in Heliotron J	255
P1-021	K. Nishimura	Activation analysis for LHD experiments with deuterium gases	259
P1-022	J. Lore	Transport studies in HSX at 1 Tesla	263
P1-023	K. Minami	Design study on plasma-loaded cyclotron resonance maser utilizing TPD-II machine in NIFS	267
P1-024	H. Yamazaki	The experimental effect of encouraging Transparent-Cathode in relativistic magnetron with "ETIGO-IV"	272

P1-025	V. Chechkin	Effects of H-mode transition on plasma flow characteristics in the helical divertor of the U-3M torsatron	276
P1-026	H. Aoyama	Time evolution of spatial structure of radial electric field in Tohoku University Heliac	280
P1-027	S. Kitajima	Effects of rotating magnetic islands driven by external perturbation fields in TU-Heliac	284
P1-028	T. Estrada	Transitions to improved core electron heat confinement in TJ-II plasmas	288
P1-030	S. Kubo	Density control by second harmonic X mode ECRH in LHD	292
P1-031	B. Seiwald	Results of the stellarator optimization with respect to the neoclassical 1/v transport	296
P1-032	T. Notake	Electron thermal energy transport research based on dynamical relationship between heat flux and temperature gradient	300
P1-033	A. Wakasa	Study of neoclassical transport of LHD plasmas applying the DCOM/NNW neoclassical transport database	304
P1-034	Y. Takeiri	Improvement of ion confinement in core electron-root confinement (CERC) plasmas in Large Helical Device	308
P1-035	S. Okamura	Summary of H-mode studies in Compact Helical System	312
P1-036	M. Yokoyama	Neoclassical plasma viscosity analyses relevant to high-ion-temperature plasmas in the Large Helical Device (LHD)	313
P1-037	A. Dinklage	Status of the international stellarator/heliotron profile database	317
P1-038	H. Yamada	Effect of ellipticity on thermal transport in ECH plasmas on LHD	321
P1-039	A. Weller	Extensions of the international stellarator database by high-beta data from W7-AS and LHD	325
P1-040	H. Funaba	Data structure for LHD plasmas in the international stellarator/heliotron profile database	329
P1-041	J. Geiger	Stability analysis of the Wendelstein 7-X configurations with increased toroidal mirror	332
P1-042	R. Ishizaki	Motion of the plasmoid in helical plasmas	336
P1-043	Y. Matsumoto	Numerical study of resistive magnetohydrodynamic mode structures in typical plasmas of the Large Helical Device	340
P1-044	L. Garcia	Resistive MHD stability studies for LHD configurations	344

P1-045	K. Ichiguchi	Mercier stability improvement in nonlinear development of LHD plasma	348
P1-046	H. Miura	Growth of eigenmodes with moderate mode numbers in nonlinear MHD simulation of LHD	352
P1-047	R.J. Jiménez Gómez	MHD activity measured with magnetic probes in TJ-II	356
P1-048	N. Nakajima	Analysis of MHD stability in high-beta plasmas in LHD	360
P1-049	S. Sakakibara	Configuration dependence of pressure-driven modes in heliotron plasmas	364
P1-050	J.H. Harris	Stability of super dense core plasmas in LHD	368
P1-051	S. Ohdachi	MHD instabilities with sharply peaked pressure profile after ice-pellets injection in the Large Helical Device	371
P1-052	N. Mizuguchi	Nonlinear simulation of collapse phenomenon in helical plasma with large pressure gradient	375
P1-053	Y. Narushima	3-D ideal MHD stability of super dense core plasma in LHD	379
P1-054	C.C. Hegna	Non-ideal MHD ballooning modes in three-dimensional configurations	383
P1-055	R. Seki	Analysis of the alpha particle orbits in the high beta plasmas of the Large Helical Device	387
P1-056	A. Ware	Effect of symmetry-breaking on ballooning modes in quasi-symmetric stellarators	391
P1-057	E.A. Veshchev	Simulation of angle and energy resolved fluxes of escaping neutral particles from fusion plasmas with anisotropic ion distributions.	392
P1-058	M. Tokitani	Damage evolution and particle retention in metals bombarded by neutral helium particles at the first wall positions in LHD	396
P1-059	R. Maingi	The boundary physics program plan for the initial research phase of the National Compact Stellarator Experiment	400
P1-061	M. Sato	Material science from the view point of energy flowing	401
P1-062	S. Takayama	Reduction behavior of magnetite for microwave frequency	402
P1-063	M. Tanaka	Microwave heating of materials: From polar liquid to metal oxides	406
P1-065	N. Ashikawa	Investigation of effective cleaning method using ion cyclotron conditioning in LHD	407

P1-066	S. Morita	H/He ratio as a function of wall conditioning and plasma facing material during past 9 years in LHD	410
P1-067	K. Narihara	Abrupt intense radiation from divertor plates of the Large Helical Device	414
P1-068	M. Shoji	Optimization of a closed divertor configuration for three dimensionally complicated magnetic structure in the LHD plasma periphery	418
P1-069	N. Tamura	Tracer impurity transport inside an IDB plasma of LHD	422
P1-070	M. Lehnen	The DED at TEXTOR: Transport properties of a helical divertor	426
P1-071	H. Matsuura	Effect of plasma parameters on H alpha emission and its spectrum	430
P1-072	A. Ito	Hydrogen absorption of back side of graphene	434
P1-073	L. Pichl	Comparison of charge transfer in proton collisions with methane and silane for simulations of divertor impurities and technological plasmas	438

