



Contents

Proceedings of the 18th International Conference on Plasma–Surface Interactions in Controlled Fusion Devices

Committees	vii
Preface	xvii

Section 1. Reviews

Recent analysis of key plasma wall interactions issues for ITER, <i>J. Roth, E. Tsitrone, A. Loarte, Th. Loarer, G. Counsell, R. Neu, V. Philipps, S. Brezinsek, M. Lehnert, P. Coad, Ch. Grisolia, K. Schmid, K. Krieger, A. Kallenbach, B. Lipschultz, R. Doerner, R. Causey, V. Alimov, W. Shu, O. Ogorodnikova, A. Kirschner, G. Federici, A. Kukushkin and EFDA PWI Task Force, ITER PWI Team, Fusion for Energy, ITPA SOL/DIV</i>	72
Power and particle exhaust in tokamaks: Integration of plasma scenarios with plasma facing materials and components, <i>W. Fundamenski</i>	76
Fuel retention in tokamaks, <i>T. Loarer</i>	80
Edge turbulence and SOL transport in tokamaks, <i>J.A. Boedo</i>	84

Section 2. Material erosion, migration, transport and dust

Dynamics of erosion and deposition in tokamaks, <i>A. Kreter, S. Brezinsek, J.P. Coad, H.G. Esser, W. Fundamenski, V. Philipps, R.A. Pitts, V. Rohde, T. Tanabe, A. Widdowson and JET EFDA contributors</i>	38
Effects of tungsten surface conditions on carbon deposition, <i>Y. Ueda, M. Fukumoto, A. Yamawaki, Y. Soga, Y. Ohtsuka, S. Brezinsek, T. Hirai, A. Kirschner, A. Kreter, A. Litnovsky, V. Philipps, A. Pospieszczyk, B. Schweer, G. Sergienko, T. Tanabe, K. Sugiyama, K. Ohya, N. Ohno and The TEXTOR team</i>	44
Analysis of carbon deposited layer growth processes in Tore Supra, <i>P. Roubin, B. Pégourié, R. Smirnov, C. Martin, M. Richou, Y. Marandet, C. Pardanaud, C. Brosset and J. Gunn</i>	49
From eroded material to dust: An experimental evaluation of the mobilised dust production in Tore Supra, <i>C. Grisolia, S. Rosanvallon, A. Loarte, P. Sharpe and C. Arnas</i>	53
Dust limit management strategy in tokamaks, <i>S. Rosanvallon, C. Grisolia, P. Andrew, S. Ciattaglia, P. Delaporte, D. Douai, D. Garnier, E. Gauthier, W. Gulden, S.H. Hong, S. Pitcher, L. Rodriguez, N. Taylor, A. Tesini, S. Vartanian, A. Vatry and M. Wykes</i>	57
Spherical cauliflower-like carbon dust formed by interaction between deuterium plasma and graphite target and its internal structure, <i>N. Ohno, M. Yoshimi, M. Tokitani, S. Takamura, K. Tokunaga and N. Yoshida</i>	61
Characterization of the carbon erosion on the limiter of Tore Supra, <i>E. Delchambre, A. Beaute, S. Brezinsek, S. Carpentier, Y. Corre, G. Dunand, A. Ekedahl, A. Escarguel, J. Gunn, Y. Marandet, V. Moncada, P. Monier-Gabert, J.M. Travere, E. Tsitrone and B. Pegourié</i>	65
Investigation of local carbon transport in the ASDEX Upgrade di- vertor using $^{13}\text{CH}_4$ puffing, <i>R. Pugno, K. Krieger, M. Airila, L. Aho- Mantila, A. Kreter, S. Brezinsek, V. Rohde, D. Coster, A. Chankin, M. Wischmeier and ASDEX Upgrade Team</i>	68
Simulation of hydrocarbon reflection from carbon and tungsten surfaces and its impact on codeposition patterns on plasma fac- ing components, <i>K. Ohya, Y. Kikuhara, K. Inai, A. Kirschner, D. Borodin, A. Ito, H. Nakamura and T. Tanabe</i>	72
Studies of hydrocarbon cracking by molecular beam injection in He plasmas in the TJ-II stellarator, <i>F.L. Tabarés, D. Tafalla, T.G. Wurgie and J.A. Ferreira</i>	76
Appearance of hot spots due to deposits in the JET MKII-HD outer divertor, <i>G.J. van Rooij, S. Brezinsek, J.P. Coad, W. Fundamenski, V. Philipps, G. Arnoux, M.F. Stamp and JET EFDA contributors</i>	80
Modeling of velocity distributions of dust in tokamak edge plasmas and dust-wall collisions, <i>R.D. Smirnov, S.I. Krasheninnikov, A.Yu. Pigarov, D.J. Benson, M. Rosenberg and D.A. Mendis</i>	84
Transfer of rovibrational energies in hydrogen plasma–carbon sur- face interactions, <i>P.S. Krstic, E.M. Hollmann, C.O. Reinhold, S.J. Stuart, R.P. Doerner, D. Nishijima and A.Yu. Pigarov</i>	88
A study of JET carbon impurity sources, <i>J.D. Strachan, G. Corrigan, M. Stamp, J. Spence, J. Zacks and JET-EFDA Contributors</i>	92
Correlation of submicron dust production in DIII-D to impulsive wall heating from ELMs, <i>B.D. Bray, W.P. West and D. Rudakov</i>	96
Investigation of temporal evolution and spatial distribution of dust creation events in DITS campaign using visible CCD cameras in Tore Supra, <i>S.-H. Hong, C. Grisolia, P. Monier-Gabert and Tore Supra team</i>	100
Ion drag force on dust grains in the magnetized edge plasma, <i>K. Matyash, R. Schneider, V.R. Ikkurthi and A. Melzer</i>	103
Modelling of Be transport in PSI experiments at PISCES-B, <i>D. Borodin, A. Kirschner, A. Kreter, V. Philipps, A. Pospieszczyk, R. Ding, R. Doerner, D. Nishijima and J. Yu</i>	106
Be wall sources and migration in L-mode discharges after Be eva- poration in the JET tokamak, <i>K. Krieger, S. Brezinsek, S. Jachmich, S. Lisgo, M. Stamp, H.G. Esser, A. Kreter, S. Menmuir, Ph. Mertens, V. Philipps, P. Sundelin and JET EFDA contributors</i>	110
SDTrimSP-2D studies of the influence of mutual flux arrangement on erosion and deposition, <i>A. Mutzke, R. Schneider and I. Bizyukov</i>	115
Simulation of redeposition of carbon/hydrocarbon on a material surface with castellated structures, <i>K. Inai, K. Ohya, Y. Tomita, A. Kirschner, A. Litnovsky and T. Tanabe</i>	119
'Mixed-material evolution analysis of the ITER divertor', <i>J.N. Brooks and J.P. Allain</i>	123
Steady-state and transient hydrocarbon production in graphite by low energy impact of atomic and molecular deuterium projec- tiles, <i>H. Zhang and F.W. Meyer</i>	127
Erosion yields of deposited beryllium layers, <i>D. Nishijima, R.P. Doerner, M.J. Baldwin and G. De Temmerman</i>	132
Molecular dynamics simulations of atomic carbon on tungsten sur- face, <i>Z. Yang, Y.M. Yang, G.-H. Lu and G.-N. Luo</i>	136
Carbon dust formation in a cold plasma from cathode sputtering, <i>C. Arnas, A. Mouberi, K. Hassouni, A. Michau, G. Lombardi, X. Bonnin, F. Bénédic and B. Pégourié</i>	140

Characterization of carbon and tungsten micro-particles mobilized by laser irradiation in order to develop an ITER dust removal technique, <i>A. Vatry, M. Naiim Habib, Ph. Delaporte, C. Grisolia, D. Grojo, S. Rosanvallon and M. Sentis</i>	144	Carbon transport in the stochastic magnetic boundary of TEXTOR, <i>G. Telesca, E. Delabie, O. Schmitz, S. Brezinsek, K.H. Finken, M. von Hellermann, M. Jakubowski, M. Lehnens, Y. Liang, A. Pospieszczyk, U. Samm, M. Tokar, B. Unterberg, G. Van Oost and The TEXTOR Team</i>	227
Erosion and deposition behaviour of a-C:H layers in the private flux region of the JET MKII-HD divertor, <i>H.G. Esser, A. Kreter, V. Philips, A.M. Widdowson, J.P. Coad, M. Stamp and JET EFDA Contributors</i>	148	Section 3. Divertor physics	
Estimations of erosion fluxes, material deposition and tritium retention in the divertor of ITER, <i>A. Kirschner, D. Borodin, V. Philips, U. Samm, R. Ding, K. Schmid, J. Roth, A. Kukushkin, G. Federici and A. Loarte</i>	152	Edge plasma physics/plasma-wall interactions during high density operation in LHD, <i>A. Komori, T. Morisaki, S. Masuzaki, M. Kobayashi, Y. Suzuki, R. Sakamoto, S. Morita, M.B. Chowdhuri, M. Goto, J. Miyazawa, I. Yamada, K. Narihara, N. Ohyabu, A. Sagara, H. Yamada, O. Motojima and The LHD experimental group</i>	232
Micro/nano scale modification of plasma facing components in LHD and its impact on the metal dust generations, <i>M. Tokitani, Y. Ohtawa, N. Yoshida, K. Tokunaga, T. Fujiwara, N. Ashikawa, S. Masuzaki, H. Yamada, A. Sagara, N. Noda, A. Komori and LHD experimental group</i>	156	Highly radiating type-III ELMY H-mode with low plasma core pollution, <i>J. Rapp, M.R. de Baar, W. Fundamenski, M. Brix, R. Felton, C. Giroud, A. Huber, S. Jachmich, E. Joffrin, I. Nunes, G.J. van Rooij, M. Stamp, G. Telesca, R. Zagorski and JET EFDA contributors</i>	238
Characterization of chemical sputtering using the Mark II DiMES porous plug injector in attached and semi-detached divertor plasmas of DIII-D, <i>A.G. McLean, J.W. Davis, P.C. Stangeby, S.L. Allen, J.A. Boedo, B.D. Bray, S. Brezinsek, N.H. Brooks, M.E. Fenstermacher, M. Groth, A.A. Haasz, E.M. Hollmann, R.C. Isler, C.J. Lasnier, Y. Mu, T.W. Petrie, D.L. Rudakov, J.G. Watkins, W.P. West, D.G. Whyte and C.P.C. Wong</i>	160	Sensitivity of injected argon behavior to changes in magnetic balance in double-null plasmas in DIII-D, <i>T.W. Petrie, N.H. Brooks, M.E. Fenstermacher, M. Groth, A.W. Hyatt, C.J. Lasnier, A.W. Leonard, G.D. Porter, M.J. Schaffer, M.R. Wade, J.G. Watkins and W.P. West</i>	242
Release conditions of dust particle from plasma-facing wall in oblique magnetic field, <i>Y. Tomita, G. Kawamura, R. Smirnov, T. Takizuka and D. Tskhakaya</i>	164	Radiating divertor experiments in the HL-2A tokamak, <i>L.W. Yan, W.Y. Hong, J. Cheng, M.X. Wang, J. Qian, Y.D. Pan, Y. Zhou, W. Li, D.L. Yu, K.J. Zhao, Z. Cao, Q.W. Yang, X.R. Duan and Y. Liu</i>	246
Numerical analysis of incident angle of heavy metal impurity to plasma facing components by IMPGYRO, <i>K. Hoshino, M. Toma, M. Furubayashi, A. Hatayama, K. Inai and K. Ohya</i>	168	Current understanding of divertor detachment: Experiments and modelling, <i>M. Wischmeier, M. Groth, A. Kallenbach, A.V. Chankin, D.P. Coster, R. Dux, A. Herrmann, H.W. Müller, R. Pugno, D. Reiter, A. Scarabosio, J.G. Watkins and DIII-D team and ASDEX Upgrade team</i>	250
Kinetic analysis of ion incident angle distribution on a plasma-facing wall, <i>G. Kawamura, A. Fukuyama and Y. Tomita</i>	172	Radiation process of carbon ions in JT-60U detached divertor plasmas, <i>T. Nakano, H. Kubo, N. Asakura, K. Shimizu, H. Kawashima and S. Higashijima</i>	255
Improvement of surface processes modelling in the ERO code, <i>M.I. Airila, T. Ikonen, D. Borodin, A. Kirschner, K. Nordlund and A. Loarte</i>	175	Impurity seeding and scaling of edge parameters in ITER, <i>H.D. Pacher, A.S. Kukushkin, G.W. Pacher, V. Kotov, G. Janeschitz, D. Reiter and D.P. Coster</i>	259
In-situ measurements of carbon and deuterium deposition using the fast reciprocating probe in TEXTOR, <i>B. Emmoth, A. Kreter, A. Hallén, M. Jakubowski, M. Lehnens, A. Litnovsky, P. Petersson, V. Philips, G. Possnert, M. Rubel, B. Schweer, P. Sundelin, B. Unterberg, P. Wienhold and TEXTOR team</i>	179	Divertor heat load in ITER-like advanced tokamak scenarios on JET, <i>G. Arnoux, P. Andrew, M. Beurskens, S. Brezinsek, C.D. Challis, P. De Vries, W. Fundamenski, E. Gauthier, C. Giroud, A. Huber, S. Jachmich, X. Litaudon, R.A. Pitts, F. Rimini and JET EFDA contributors</i>	263
Molecular dynamics simulation of hydrogen atom sputtering on the surface of graphite with defect and edge, <i>A. Ito, Y. Wang, S. Irle, K. Morokuma and H. Nakamura</i>	183	The impact of divertor detachment on carbon sources in JET L-mode discharges, <i>S. Brezinsek, A.G. Meigs, S. Jachmich, M.F. Stamp, J. Rapp, R. Felton, R.A. Pitts, V. Philips, A. Huber, R. Pugno, G. Sergienko, A. Pospieszczyk and JET-EFDA contributors</i>	267
Study of carbon dust formation and their structure using inductively coupled plasmas under high atomic hydrogen irradiation, <i>Y. Takeguchi, M. Kyo, Y. Uesugi, Y. Tanaka and S. Masuzaki</i>	188	Code development for ITER edge modelling – SOLPS5.1, <i>X. Bonnin, A.S. Kukushkin and D.P. Coster</i>	274
Coupled plasma-wall modeling, <i>A.Yu. Pigarov and S.I. Krasheninnikov</i>	192	Pressure balance between midplane and inner and outer divertor in ASDEX Upgrade H-mode discharges, <i>A. Kallenbach, R. Dux, T. Eich, R. Fischer, A. Herrmann, B. Kurzan, H.W. Müller, R. Neu, R. Pugno, M. Wischmeier, E. Wolfrum and the ASDEX Upgrade Team</i>	278
Introduction of a new experimental device for simulating parasitic plasmas such as those expected under the divertor dome, <i>G. Lombardi, F. Bénédic, K. Hassouni, A. Michau and X. Bonnin</i>	196	ITER research plan of plasma-wall interaction, <i>M. Shimada, R. Pitts, A. Loarte, D.J. Campbell, M. Sugihara, V. Mukhovatov, A. Kukushkin and V. Chuyanov</i>	282
Influence of carbon concentration on chemical behavior of energetic deuterium implanted into carbon-contained boron film, <i>S. Suzuki, Y. Yang, A. Yoshikawa, Y. Kikuchi, A. Sagara, Y. Oya and K. Okuno</i>	200	Investigation on the influence of plasma properties and SOL transport on the particle flux profiles on divertor plates in the Large Helical Device, <i>S. Masuzaki, M. Kobayashi, T. Morisaki, N. Ohyabu, A. Komori, Y. Feng and The LHD experimental group</i>	286
A time dependent model to study the effect of surface roughness on reactive-diffusive transport in porous media, <i>M. Warrier, A. Rai and R. Schneider</i>	203	Investigation of detached recombining deuterium plasma and carbon chemical erosion in the toroidal divertor simulator NAGDIS-T, <i>K. Yada, N. Matsui, N. Ohno, S. Kajita, S. Takamura and M. Takagi</i>	290
Coupled IMPGYRO-EDDY simulation of tungsten impurity transport in tokamak geometry, <i>M. Toma, K. Hoshino, K. Inai, M. Furubayashi, A. Hatayama and K. Ohya</i>	207	Comparison of kinetic and fluid neutral models for attached and detached state, <i>M. Furubayashi, K. Hoshino, M. Toma, A. Hatayama, D. Coster, R. Schneider, X. Bonnin, H. Kawashima, N. Asakura and Y. Suzuki</i>	295
Measurements of accumulated metallic impurities during Li ⁺ operation in NSTX, <i>S.F. Paul, C.H. Skinner, J.A. Robinson, B. LeBlanc and H.W. Kugel</i>	211	Fluid modeling of an ELMing H-mode and a RMP H-mode, <i>S. Mordijk, R.A. Moyer, T.E. Evans, X. Bonnin, J. Canik, D. Coster, M. Groth, R. Maingi, T.H. Osborne, L.W. Owen, T.W. Petrie, D. Reiter, J.G. Watkins and E.A. Unterberg</i>	299
Fast camera imaging of dust in the DIII-D tokamak, <i>J.H. Yu, D.L. Rudakov, A.Yu. Pigarov, R.D. Smirnov, N.H. Brooks, S.H. Muller and W.P. West</i>	216	Comparative study of recombining He plasmas below 0.1 eV using laser Thomson scattering and spectroscopy in the divertor simulator MAP-II, <i>F. Scotti and S. Kado</i>	303
3D-DIVIMP-HC modeling analysis of methane injection into DIII-D using the DiMES porous plug injector, <i>Y. Mu, A.G. McLean, J.D. Elder, P.C. Stangeby, B.D. Bray, N.H. Brooks, J.W. Davis, M.E. Fenstermacher, M. Groth, C.J. Lasnier, D.L. Rudakov, J.G. Watkins, W.P. West and C.P.C. Wong</i>	220		
Impurity production and acceleration in CTIX, <i>D. Buchenauer, W.M. Clift, R. Klauer, R.D. Horton, S.J. Howard, S.J. Brockington, R.W. Evans and D.Q. Hwang</i>	223		

Kinetic effect of thermal force on impurity transport: Simulation of JT-60SA divertor with integrated divertor code SONIC, <i>K. Shimizu, T. Takizuka and H. Kawashima</i>	307	Interpretive modelling of scrape-off plasmas on the MAST tokamak, <i>J. Harrison, S. Lisgo, G.F. Counsell, K. Gibson, J. Dowling, L. Trojan and D. Reiter</i>	392
Characteristics of vibrational temperature of hydrogen molecules in detached plasma, <i>A. Nakanowatari, A. Tonegawa, T. Shibuya and K. Kawamura</i>	311	Experimental investigations of turbulent structure propagation across a $E \times B$ -velocity shear, <i>T. Windisch, O. Grulke and T. Klinger</i>	395
2D divertor design calculations for the national high-power advanced torus experiment, <i>J.M. Canik, R. Maingi, L. Owen, J. Menard, R. Goldston, M. Kotschenreuther, P. Valanju and S. Mahajan</i>	315	3D analysis of impurity transport and radiation for ITER limiter start-up configurations, <i>X. Zha, F. Sardei, Y. Feng, M. Kobayashi, A. Loarte and G. Federici</i>	398
Section 4. Transport in the plasma edge/SOL			
Comparison of 2D models for the plasma edge with experimental measurements and assessment of deficiencies, <i>A.V. Chankin, D.P. Coster and the ASDEX Upgrade Team</i>	319	Self-consistent modeling of impurity seeded JET advanced tokamak scenarios, <i>R. Zagórski, G. Telesca, G. Arnoux, M. Beurskens, W. Fundamenski, K. McCormick and JET-EFDA Contributors</i>	404
Model prediction of impurity retention in stochastic magnetic boundary and comparison with edge carbon emission in LHD, <i>M. Kobayashi, Y. Feng, S. Morita, M.B. Chowdhuri, M. Goto, S. Masuzaki, N. Ohyabu, T. Morisaki, H. Yamada, I. Yamada, K. Narihara, K. Sato, H. Funaba, N. Tamura, Y. Nakamura, A. Komori, O. Motojima and The LHD experimental group</i>	325	Simulation of H-modes discharges in ASDEX-Upgrade and MAST, <i>V. Rozhansky, E. Kaveeva, P. Molchanov, I. Veselova, S. Voskoboinikov, D. Coster, G. Counsell, A. Kirk, S. Lisgo and ASDEX-Upgrade Team</i>	408
Particle confinement control with resonant magnetic perturbations at TEXTOR, <i>O. Schmitz, J.W. Coenen, H. Frerichs, M. Kantor, M. Lehnert, B. Unterberg, S. Brezinsek, M. Clever, T. Evans, K.H. Finken, M. Jakubowski, A. Kraemer-Flecken, V. Phillips, D. Reiter, U. Samm, G.W. Spakman, G. Telesca and The TEXTOR team</i>	330	SOLPS5 simulations of Type I ELMing H-mode at JET, <i>B. Gulejová, R.A. Pitts, D. Coster, X. Bonnin, M. Beurskens, S. Jachmich, A. Kallenbach and contributors to the EFDA-JET workprogramme</i>	412
Kinetic simulations of the parallel transport in the JET scrape-off layer, <i>D. Tskhakaya, R.A. Pitts, W. Fundamenski, T. Eich, S. Kuhn and JET EFDA Contributors</i>	335	Biased electrodes for SOL control in NSTX, <i>S.J. Zweben, R.J. Maqueda, A.L. Roquemore, C.E. Bush, R. Kaita, R.J. Marsala, Y. Raitses, R.H. Cohen and D.D. Ryutov</i>	417
Spatial structure of scrape-off-layer filaments near the midplane and X-point regions of Alcator-C-Mod, <i>J.L. Terry, S.J. Zweben, M.V. Umansky, I. Cziegler, O. Grulke, B. LaBombard and D.P. Stotler</i>	339	Dependence of SOL widths on plasma current and density in NSTX H-mode plasmas, <i>J.-W. Ahn, R. Maingi, J.A. Boedo, V. Soukhanovskii and The NSTX team</i>	421
Measurements and simulations of scrape-off layer flows in the DIII-D Tokamak, <i>M. Groth, G.D. Porter, J.A. Boedo, N.H. Brooks, R.C. Isler, W.P. West, B.D. Bray, M.E. Fenstermacher, R.J. Groebner, A.W. Leonard, R.A. Moyer, T.D. Rognlien, J.G. Watkins and J.H. Yu</i>	343	Shearing effects on density burst propagation in SOL plasmas, <i>Ph. Ghendrih, G. Ciraolo, Y. Larmande, Y. Sarazin, P. Tamain, P. Beyer, G. Chiavassa, G. Darmet, X. Garbet and V. Grandgirard</i>	425
3D modelling of edge parallel flow asymmetries, <i>P. Tamain, Ph. Ghendrih, E. Tsitrone, Y. Sarazin, X. Garbet, V. Grandgirard, J. Gunn, E. Serre, G. Ciraolo and G. Chiavassa</i>	347	Comparison of edge plasma behavior at different poloidal positions in Heliotron J, <i>T. Mizuchi, K. Murai, S. Watanabe, S. Yamamoto, S. Kobayashi, K. Nagasaki, H. Okada, G. Motojima, H. Arimoto, F. Hamagami, D. Katayama, H. Matsuoka, A. Nakajima, H. Takahashi, H. Yasuda, K. Mukai, Y. Kowada, K. Hosaka, S. Mihara, N. Nishino, Y. Nakashima, Y. Nakamura, K. Hanatani, K. Kondo and F. Sano</i>	428
The influence of resonant magnetic perturbations on edge transport in limiter H-mode plasmas in TEXTOR, <i>B. Unterberg, S.S. Abdullaev, J.W. Coenen, K.H. Finken, H. Frerichs, M.W. Jakubowski, D. Kalupin, M.Yu. Kantor, A. Krämer-Flecken, M. Lehnert, Y. Liang, U. Samm, O. Schmitz, S. Soldatov, G.W. Spakman, H. Stoschus, M.Z. Tokar, G. van Wassenhove, Y. Xu, O. Zimmermann and The TEXTOR-team</i>	351	Measurement of peripheral plasma turbulence using a fast camera in Heliotron J, <i>N. Nishino, T. Mizuchi, S. Kobayashi, K. Nagasaki, H. Okada, F. Sano, S. Yamamoto and K. Kondo</i>	432
Intermittent transport in the JET far-SOL, <i>C. Silva, B. Gonçalves, C. Hidalgo, M.A. Pedrosa, W. Fundamenski, M. Stamp, R.A. Pitts and JET-EFDA contributors</i>	355	MARFE stability and movement in an ELMY H-mode NSTX discharge, <i>F. Kelly, R. Maingi, R. Maqueda, J. Menard and S. Paul</i>	436
On blob generation mechanisms in tokamak edge plasma, <i>K. Bodí, A.I. Smolyakov and S.I. Krasheninnikov</i>	359	The enhanced pedestal H-mode in the National Spherical Torus experiment, <i>R. Maingi, R.E. Bell, B.P. LeBlanc, D.A. Gates, S.M. Kaye, J.E. Menard, S.A. Sabbagh and H. Yuh</i>	440
Statistical analysis to the SOL plasma fluctuation in JT-60U, <i>N. Asakura, N. Ohno, H. Tanaka, H. Kawashima and T. Nakano</i>	364	Edge turbulence scaling in RFX-mod as measured using GPI diagnostic, <i>P. Scarin, M. Agostini, R. Cavazzana, F. Sattin, G. Serianni, M. Spolaore and N. Vianello</i>	444
Flow generation and intermittent transport in the scrape-off-layer of the Tore Supra tokamak, <i>N. Fedorczak, J.P. Gunn, Ph. Ghendrih, P. Monier-Garbet and A. Pocheau</i>	368	Magnetic and electrostatic structures measured in the edge region of the RFX-mod experiment, <i>M. Spolaore, N. Vianello, M. Agostini, R. Cavazzana, E. Martines, G. Serianni, P. Scarin, E. Spada, M. Zuin and V. Antoni</i>	448
Suppression of the intermittent blob-type transport by the resonant magnetic perturbation (RMP) in the TEXTOR tokamak, <i>Y. Xu, R.R. Weynants, M. Van Schoor, M. Vergote, S. Jachmich, M.W. Jakubowski, M. Miti, D. Reiser, O. Schmitz, K.H. Finken, M. Lehnert, B. Unterberg, D. Reiter, U. Samm and The TEXTOR team</i>	372	Edge plasma modelling for transport analysis on JT-60U tokamak, <i>Y. Chen, H. Kawashima, X. Gao, L. Hu, N. Asakura, K. Shimizu, H. Takenaga and D.P. Coster</i>	452
Indications of an inward pinch in the inner SOL of DIII-D from ^{13}C deposition experiments, <i>J.D. Elder, A.G. McLean, P.C. Stangeby, S.L. Allen, J.A. Boedo, B.D. Bray, N.H. Brooks, M.E. Fenstermacher, M. Groth, A.W. Leonard, D.L. Rudakov, W.R. Wampler, J.G. Watkins, W.P. West and D.G. Whyte</i>	376	Turbulence studies by fast camera imaging experiments in the TJII stellarator, <i>D. Carralero, E. de la Cal, J.L. de Pablos, A. de Coninck, J.A. Alonso, C. Hidalgo, B.Ph. van Milligen and M.A. Pedrosa</i>	457
Section 5. Fuelling, pumping and recycling			
Nonlinear control of transport in drift wave turbulence, <i>C. Brandt, O. Grulke and T. Klinger</i>	380	Plasma impurity content, gas fueling, and exhaust on DIII-D over extended periods between boronizations, <i>W.P. West, M. Groth, A.W. Hyatt, N.H. Brooks, G.L. Jackson, M.R. Wade and C.M. Greenfield</i>	461
Modelling of SOL transport and radiation losses for ITER with the integrated tokamak code TOKES, <i>I.S. Landman and G. Janeschitz</i>	384	Main chamber high recycling on ASDEX upgrade, <i>K. McCormick, R. Dux, R. Fischer, A. Scarabosio and The ASDEX Upgrade Team</i>	465
Modelling SOL flow pattern spreading in the edge plasma, <i>L. Isoardi, G. Ciraolo, G. Chiavassa, P. Haldenwang, E. Serre, Ph. Ghendrih, Y. Sarazin, F. Schwander, X. Garbet and P. Tamain</i>	388	Pedestal fueling through interpretive analysis of measured main chamber and divertor target flux in DIII-D, <i>A.W. Leonard, M. Groth, G.D. Porter and M.E. Rensink</i>	470
		Gas balance in ASDEX Upgrade with tungsten first wall, <i>V. Rohde, V. Mertens, A. Scarabosio and ASDEX Upgrade Team</i>	474
		Effect of disruptions on fuel release from JET walls, <i>V. Philippss, M. Freisinger, A. Huber, T. Loarer and JET EFDA contributors</i>	478
		Spatially resolved charge exchange flux calculations on the Toroidal Pumped Limiter of Tore Supra, <i>Y. Marandet, E. Tsitrone, P. Börner,</i>	

D. Reiter, A. Beauté, E. Delchambre, A. Escarguel, S. Brezinsek, P. Genesio, J. Gunn, P. Monier-Garbet, R. Mitteau and B. Pégourié	482	release, G. De Temmerman, M.J. Baldwin, R.P. Doerner, D. Nishijima, R. Seraydarian and K. Schmid	564
Experimental comparison of recycling and pumping changes during resonant magnetic perturbation experiments at low and high collisionality in DIII-D, E.A. Unterberg, N.H. Brooks, T.E. Evans, M.E. Fenstermacher, D.L. Hillis, R. Maingi, S. Mordijk, R.A. Moyer, T.H. Osborne, T.W. Petrie and J.G. Watkins	486	Ion implanted deuterium retention and release from clean and oxidi- zed beryllium, M. Reinelt and Ch. Linsmeier	568
Study of the effect of a closed divertor configuration on neutral particle control in the LHD plasma periphery, M. Shoji, M. Kobayashi, S. Masuzaki, T. Watanabe, H. Yamada, A. Komori and LHD experimental groups	490	Deuterium trapping in tungsten damaged by high-energy hydrogen ion irradiation, M. Fukumoto, H. Kashiwagi, Y. Ohtsuka, Y. Ueda, M. Taniguchi, T. Inoue, K. Sakamoto, J. Yagyu, T. Arai, I. Takagi and T. Kawamura	572
Measurements of neutral gas fluxes under different plasma and di- vortor regimes in ASDEX Upgrade, A. Scarabosio, G. Haas, H.W. Müller, R. Pugno and M. Wischmeier, The ASDEX Upgrade team	494	In situ detection of hydrogen retention in TEXTOR by laser induced desorption, B. Schweer, F. Irrek, M. Zlobinski, A. Huber, G. Sergienko, S. Brezinsek, V. Philippus and U. Samm	576
Excited state distribution of reflected hydrogen atoms at metal surfaces – Development of theoretical models, D. Kato, T. Kenmotsu, K. Ohya and T. Tanabe	498	Bulk hydrogen retention in neutron-irradiated graphite at elevated temperatures, H. Atsumi, T. Tanabe and T. Shikama	581
Active particle control in the CPD compact spherical tokamak by a lithium-gettered rotating drum limiter, Y. Hirooka, H. Zushi, R. Bhattacharyay, M. Sakamoto, H. Idei, T. Yoshinaga, Y. Nakashima, Y. Higashizono and The CPD group	502	Laser-induced removal of co-deposits from graphitic plasma-facing components: Characterization of irradiated surfaces and dust particles, P. Gąsior, F. Irrek, P. Petersson, H.J. Penkalla, M. Rubel, B. Schweer, P. Sundelin, E. Wessel, J. Linke, V. Philippus, B. Emmoth, J. Wolowski and T. Hirai	585
Comparison of pellet acceleration model results to experimentally observed penetration depths, T. Szepesi, S. Kálvin, G. Kocsis, P.T. Lang, I. Senichenkov and ASDEX Upgrade Team	507	Deuterium trapping in carbon fiber composites exposed to D plasma, A. Airapetov, L. Begrambekov, C. Brosset, J.P. Gunn, C. Grisolía, A. Kuzmin, T. Loarer, M. Lipa, P. Monier-Garbet, P. Shigin, E. Tsitrone and A. Zakharov	589
Recycling studies based on two-dimensional visible light measure- ments and Monte-Carlo simulation in mirror and helical systems, Y. Nakashima, Y. Higashizono, H. Kawano, N. Nishino, S. Kobayashi, T. Mizuuchi, M. Shoji, K. Nagasaki, H. Okada, F. Sano, K. Kondo, Y. Yoneda, R. Yonenaga, M. Yoshikawa and T. Imai	511	Optimization of non-oxidative carbon-removal techniques by nitro- gen-containing plasmas, J.A. Ferreira, F.L. Tabarés and D. Tafalla	593
On the secular density rises in NBI-heated H-mode plasmas in NSTX, V.A. Soukhanovskii, R.E. Bell, C. Bush, R. Kaita, H.W. Kugel, B.P. LeBlanc, R. Maingi, R. Raman, A.L. Roquemore and NSTX Re- search Team	516	Experiments to measure hydrogen release from graphite walls dur- ing disruptions in DIII-D, E.M. Hollmann, N.A. Pablant, D.L. Rudakov, J.A. Boedo, N.H. Brooks, T.C. Jernigan and A.Yu. Pigarov	597
Reemission of neutral hydrogen molecules from tungsten, I. Čadež, S. Markelj, P. Pelicon and Z. Rupnik	520	Carbon removal from tile gap structures with oxygen glow dis- charges, T. Schwarz-Selinger, F. Genoese, C. Hopf and W. Jacob	602
Influence of impurity and recycling on high- β steady-state plasmas sustained by rotating magnetic fields current drive, H.Y. Guo, J.A. Grossnickle, A.L. Hoffman and G.C. Vlases	524	Ion-driven deuterium permeation through tungsten at high tem- peratures, Yu.M. Gasparyan, A.V. Golubeva, M. Mayer, A.A. Pisarev and J. Roth	606
Numerical modelling of steady-state fluxes at the ITER first wall, V. Kotov, A. Litnovsky, A.S. Kukushkin, D. Reiter and A. Kirschner	528	Hydrogenic retention in tungsten exposed to ITER divertor relevant plasma flux densities, G.M. Wright, A.W. Kleyn, E. Alves, L.C. Alves, N.P. Barradas, G.J. van Rooij, A.J. van Lange, A.E. Shumack, J. Westerhout, R.S. Al, W.A.J. Vijvers, B. de Groot, M.J. van de Pol, H.J. van der Meiden, J. Rapp and N.J. Lopes Cardozo	610
Section 6. Tritium trapping and recovery		Assessment of the flash-lamp photon-cleaning detritiation method tested at JET, N. Bekris, J.P. Coad, A. Widdowson, A. Erbe, J. Ehrmann, B. Kloppe and JET-EFDA Contributors	614
Oxidation of carbon deposits as a fuel removal technique for appli- cation in fusion devices, J.W. Davis and A.A. Haasz	532	Fuel retention in impurity seeded long discharges in Tore Supra, E. Tsitrone, J. Bucalossi, S. Brezinsek, C. Brosset, S. Carpentier, Y. Corre, E. Delchambre, P. Devynck, A. Grosman, J. Gunn, M. Kocan, T. Loarer, Y. Marandet, O. Meyer, P. Monier-Garbet, B. Pégourié, P. Roubin, J.C. Vallet and C. Balorin	618
Carbon balance and deuterium inventory from a carbon dominated to a full tungsten ASDEX Upgrade, M. Mayer, V. Rohde, K. Sugiyama, J.L. Chen, X. Gong, C. Hopf, J. Likonen, S. Lindig, R. Neu, G. Ramos, E. Vainonen-Ahlgren, A. Wiltner and ASDEX Upgrade Team	538	Behavior of hydrogen isotope retention in carbon implanted tung- sten, Y. Oya, Y. Inagaki, S. Suzuki, H. Ishikawa, Y. Kikuchi, A. Yosh- ikawa, H. Iwakiri, N. Ashikawa, A. Sagara, N. Yoshida and K. Okuno	622
Measurement of hydrogenic retention and release in molybdenum with the DIONISOS experiment, G.M. Wright, D.G. Whyte and B. Lipschultz	544	Thermo-oxidation and analysis of JET codeposits, A.A. Haasz, J. Likonen, J.P. Coad, C.K. Tsui, J.W. Davis and A.M. Widdowson	626
Overview of the deuterium inventory campaign in Tore Supra: Op- erational conditions and particle balance, B. Pégourié, C. Brosset, E. Tsitrone, A. Beauté, S. Brémont, J. Bucalossi, S. Carpentier, Y. Corre, E. Delchambre, C. Desgranges, P. Devynck, D. Douai, G. Dunand, A. Ekedahl, A. Escarguel, E. Gauthier, J.P. Gunn, P. Hertout, S.-H. Hong, F. Kazarian, M. Kočan, F. Linez, Y. Marandet, A. Martinez, M. Mayer, O. Meyer, P. Monier-Garbet, P. Moreau, P. Oddon, J.-Y. Pascal, F. Rimini, J. Roth, F. Saint-Laurent, F. Samaille, S. Vartanian, C. Arnas, E. Aréou, C. Gil, J. Lasalle, L. Manenc, C. Martin, M. Richou, P. Roubin and R. Sabot	550	Post-mortem measurements of fuel retention at JET with MKII-SRP divertor, J. Likonen, J.P. Coad, D.E. Hole, S. Koivuranta, T. Renvall, M. Rubel, E. Vainonen-Ahlgren and A. Widdowson, JET-EFDA Con- tributors	631
Investigations of castellated structures for ITER: The effect of cas- tellation shaping and alignment on fuel retention and impurity deposition in gaps, A. Litnovsky, P. Wienhold, V. Philippus, K. Krieger, A. Kirschner, D. Matveev, D. Borodin, G. Sergienko, O. Schmitz, A. Kreter, U. Samm, S. Richter, U. Breuer and TEXTOR Team	556	Hydrogen isotopes retention in the outboard first wall tiles of JT-60U, M. Yoshida, T. Tanabe, Y. Nobuta, T. Hayashi, K. Masaki and M. Sato	635
The scavenger effect – Does it work?, W. Bohmeyer, F.L. Tabares, M. Baudach, A. Cwiklinski, A. Markin, T. Schwarz-Selinger, J.A. Ferreira, G. Fussmann and A. Loarte	560	Erosion of a-C:H films under interaction with nitrous oxide afterglow discharge, R.Kh. Zalavutdinov, A.E. Gorodetsky, V.L. Bukhovets, A.P. Zakharov and I.V. Mazul	639
Insight into the co-deposition of deuterium with beryllium: Influ- ence of the deposition conditions on the deuterium retention and		Retention and depth profile of hydrogen isotopes in gaps of the first wall in JT-60U, Y. Nobuta, T. Arai, J. Yagyu, K. Masaki, M. Satoh, T. Tanabe, Y. Yamauchi and T. Hino	643
		Nitrogen-assisted removal of deuterated carbon layers, P. Sundelin, C. Schulz, V. Philippus, M. Rubel, G. Sergienko and L. Marot	647
		Ion-driven deuterium retention in high-Z metals, O.V. Ogorodnikova	651
		Dynamic Monte-Carlo modeling of hydrogen retention and chemical erosion from Tore Supra deposits, A. Rai, R. Schneider, M. Warrier, P. Roubin and C. Martin	655
		Hydrogen retention in ITER relevant mixed material layers, K. Sugiyama, K. Krieger, C.P. Lungu and J. Roth	659
		Interaction of tritium plasma and defects in tungsten irradiated with neutrons, Q. Xu, K. Sato and T. Yoshiie	663

Deuterium depth profiling in graphite tiles not exposed to hydrogen discharges before air ventilation of JT-60U, <i>T. Hayashi, K. Sugiyama, M. Mayer, K. Krieger, K. Masaki, T. Tanabe and M. Sato</i>	667	<i>A. Herrmann, V. Naulin and JET-EFDA contributors, ASDEX Upgrade team</i>	760
Surface temperature effects on the retention and pressure variation in continuous and cyclic plasma exposures on the tungsten, <i>K. Okamoto, H. Zushi, Y. Hirooka, R. Bhattacharyay, M. Sakamoto and M. Sato</i>	671	Transition to ELM-free improved H-mode by lithium deposition on NSTX graphite divertor surfaces, <i>D.K. Mansfield, H.W. Kugel, R. Maingi, M.G. Bell, R. Bell, R. Kaita, J. Kallman, S. Kaye, B. LeBlanc, D. Mueller, S. Paul, R. Raman, L. Roquemore, S. Sabbagh, H. Schneider, C.H. Skinner, V. Soukhanovskii, J. Timberlake, J. Wilgen and L. Zakharov</i>	764
Deuterium accumulation in carbon materials at high fluence, <i>A. Pisarev, T. Tanabe, B. Emmoth, N. Trifonov, A. Rusinov, S. Stepanov, Yu. Gasparyan, A. Spitsyn and B. Khrapunov</i>	677	Effect of external perturbation fields on divertor particle and heat loads during ELMs at JET, <i>S. Jachmich, Y. Liang, G. Arnoux, T. Eich, W. Fundamenski, H.R. Koslowski, R.A. Pitts and JET-EFDA Contributors</i>	768
The role of beryllium deuteride in plasma-beryllium interactions, <i>R.P. Doerner, M.J. Baldwin, D. Buchenauer, G. De Temmerman and D. Nishijima</i>	681	ELM control by resonant magnetic perturbations on JET and MAST, <i>E. Nardon, A. Kirk, N. Ben Ayed, M. Bécoutet, P. Cahyna, T.E. Evans, G. Huysmans, H.R. Koslowski, Y. Liang, S. Saarelma, P.R. Thomas and JET-EFDA contributors</i>	773
Hydrogen trapping in depositing carbon films, <i>L.B. Begrambekov, A.S. Kuznetsov and P.A. Shigin</i>	685	Integrated simulation of plasma surface interaction during edge localized modes and disruptions: Self-consistent approach, <i>A. Hassanein, T. Sizuk and I. Konkashbaev</i>	777
Hydrogen release from deposition layers formed from 316 stainless steel by hydrogen plasma sputtering, <i>K. Katayama, Y. Uchida, T. Fujiki, M. Nishikawa, S. Fukada, N. Ashikawa and T. Uda</i>	689	ELM filament interaction with the JET main chamber, <i>M.W. Jakubowski, W. Fundamenski, G. Arnoux, Th. Eich, R.A. Pitts, D. Reiter, R.C. Wolf and JET-EFDA contributors</i>	781
Deuterium retention in tungsten oxide under low energy D_2^+ plasma exposure, <i>N. Matsunami, N. Ohno and M. Tokitani</i>	693	Plasma interactions with the outboard chamber wall in DIII-D, <i>D.L. Rudakov, J.A. Boedo, J.H. Yu, N.H. Brooks, M.E. Fenstermacher, M. Groth, E.M. Hollmann, C.J. Lasnier, A.G. McLean, R.A. Moyer, P.C. Stangeby, G.R. Tynan, W.R. Wampler, J.G. Watkins, W.P. West, C.P.C. Wong, R.J. Bastasz, D. Buchenauer and J. Whaley</i>	785
Removal of carbon films by oxidation in narrow gaps: Thermo-oxidation and plasma-assisted studies, <i>I. Tanarro, J.A. Ferreira, V.J. Herrero, F.L. Tabarés and C. Gómez-Aleixandre</i>	701	A conceptual model of the magnetic topology and nonlinear dynamics of ELMs, <i>T.E. Evans, J.H. Yu, M.W. Jakubowski, O. Schmitz, J.G. Watkins and R.A. Moyer</i>	789
Gas-driven hydrogen isotopes permeation through different carbon materials, <i>A.V. Spitsyn, A.V. Golubeva, M. Mayer and A.A. Skovoroda</i>	705	Comparison of edge plasma perturbation during ELM control using one vs. two toroidal rows of RMP coils in ITER similar shaped plasmas on DIII-D, <i>M.E. Fenstermacher, T.E. Evans, T.H. Osborne, M.J. Schaffer, J.S. deGrassie, P. Gohil, R.J. Groebner, R.A. Moyer and the DIII-D Team</i>	793
Tritium removal by isotopic exchange, <i>T. Tanabe, K. Sugiyama, T. Shibahara, Y. Hirohata, M. Yoshida, K. Masaki and M. Sato</i>	709	Fast visible imaging of ELM-wall interactions on JET, <i>J.A. Alonso, P. Andrew, A. Neto, J.L. de Pablos, E. de la Cal, H. Fernandes, W. Fundamenski, C. Hidalgo, G. Kocsis, A. Murari, G. Petravich, R.A. Pitts, L. Rios and C. Silva, EFDA-JET contributors</i>	797
Retention behavior in tungsten and molybdenum exposed to high fluences of deuterium ions in TPE, <i>J.P. Sharpe, R.D. Kolasinski, M. Shimada, P. Calderoni and R.A. Causey</i>	713	ELM induced divertor heat loads on TCV, <i>J. Marki, R.A. Pitts, J. Horacek, D. Tskhakaya, and The TCV Team</i>	801
Calculation of deuterium retention, re-emission and reflection from a tungsten material under D^+ ions irradiation with ACAT-DIFFUSE code, <i>T. Ono, T. Kenmotsu, T. Muramoto and T. Kawamura</i>	717	Analysis of radiative disruptions in RF-heated Tore Supra plasmas using infrared imaging, <i>A. Ekedahl, J. Bucalossi, Y. Corre, E. Delchambre, G. Dunand, O. Meyer, R. Mitteau, P. Monier-Garbé, B. Pégourié, F.G. Rimini, F. Saint-Laurent, J.L. Schwob and E. Tsitrone</i>	806
Defects in tungsten responsible for molecular hydrogen isotope retention after exposure to low energy plasmas, <i>R.A. Causey, R. Doerner, H. Fraser, R.D. Kolasinski, J. Smugeresky, K. Umstadter and R. Williams</i>	721	Experimental validation of 3D simulations of tungsten melt erosion under ITER-like transient loads, <i>B. Bazylev, G. Janeschitz, I. Landman, A. Loarte, G. Federici, M. Merola, A. Zhitlukhin, V. Podkorytov, N. Klimov, J. Linke and T. Hirai</i>	810
Section 7. Transient events, their control and effects on plasma facing components		Experimental study of plasma energy transfer and material erosion under ELM-like heat loads, <i>I.E. Garkusha, V.A. Makhlaj, V.V. Chebotarev, I. Landman, V.I. Tereshin, N.N. Aksenen and A.N. Bandura</i>	814
Experimental study of PFCs erosion under ITER-like transient loads at plasma gun facility QSPA, <i>N. Klimov, V. Podkorytov, A. Zhitlukhin, D. Kovalenko, B. Bazylev, G. Janeschitz, I. Landman, S. Pestchanyi, G. Federici, A. Loarte, M. Merola, J. Linke, T. Hirai and J. Compan</i>	727	Power flux in the ITER divertor tile gaps during ELMs, <i>R. Dejarnac, M. Komm, J.P. Gunn and R. Panek</i>	818
Physics of ELM power fluxes to plasma facing components and implications for ITER, <i>A. Kirk, S. Lisgo, E. Nardon, T. Eich, A. Herrmann, A. Kallenbach and A. Loarte</i>	733	Experimental verification of FOREV-2D simulations for the plasma shield, <i>S. Pestchanyi and I. Landman</i>	822
Active control of edge localized modes with a low n perturbation fields in the JET tokamak, <i>Y. Liang, S. Jachmich, H.R. Koslowski, E. Nardon, A. Alfier, Y. Baranov, E. De La Luna, P. de Vries, T. Eich, H.G. Esser, D. Harting, V. Kiptily, A. Kreter, S. Gerasimov, M.P. Gryaznevich, D. Howell, G. Sergienko and JET-EFDA contributors</i>	740	Whole device ELM simulations, <i>D.P. Coster</i>	826
Runaway generation during disruptions in JET and TEXTOR, <i>M. Lehnen, S.S. Abdullaev, G. Arnoux, S.A. Bozhenkov, M.W. Jakubowski, R. Jaspers, V.V. Plyusnin, V. Riccardo, U. Samm and JET EFDA Contributors, The TEXTOR Team</i>	747	Plasma radiation distribution and radiation loads onto the vessel during transient events in JET, <i>A. Huber, R.A. Pitts, A. Loarte, V. Philipps, P. Andrew, S. Brezinsek, J.P. Coad, T. Eich, J.C. Fuchs, W. Fundamenski, S. Jachmich, G.F. Matthews, K. McCormick, Ph. Mertens, J. Rapp, G. Sergienko, M.F. Stamp, and JET EFDA contributors</i>	830
Arcing in ASDEX Upgrade with a tungsten first wall, <i>A. Herrmann, M. Balden, M. Lauk, K. Krieger, H.W. Müller, R. Pugno, V. Rohde and ASDEX Upgrade team</i>	751	Fast radiation dynamics during ELMs on TCV, <i>G. Veres, R.A. Pitts, A. Bencze, J. Márki, B. Tál, R. Tye and TCV Team</i>	835
Cracking failure study of ITER-reference tungsten grade under single pulse thermal shock loads at elevated temperatures, <i>T. Hirai, G. Pintuk, J. Linke and M. Batilliot</i>	755	Particle, heat, and sheath power transmission factor profiles during ELM suppression experiments on DIII-D, <i>J.G. Watkins, T.E. Evans, M. Jakubowski, R.A. Moyer, O. Schmitz, A. Wingen, M.E. Fenstermacher, I. Joseph, C.J. Lasnier and D.L. Rudakov</i>	839
The impact of large ELMs on JET, <i>R.A. Pitts, G. Arnoux, M. Beurskens, T. Eich, W. Fundamenski, A. Huber, A. Loarte, J. Marki, M.F. Stamp, P. Andrew, S. Brezinsek, H.G. Esser, B. Gulejova, S. Jachmich, A. Kreter, E. de la Luna, G.F. Matthews, V. Philipps, E. Solano and JET EFDA Contributors</i>	765	Secondary ELM filaments in NSTX, <i>R.J. Maqueda, R. Maingi, J.-W. Ahn and NSTX Team</i>	843
On the asymmetries of ELM divertor power deposition in JET and ASDEX Upgrade, <i>T. Eich, A. Kallenbach, W. Fundamenski</i>			

Spectroscopy of the tungsten plasma produced by pulsed plasma-ion streams or laser beams, <i>E. Skladnik-Sadowska, K. Malinowski, M.J. Sadowski, J. Wolowski, P. Gasior, M. Kubkowska, M. Rosinski, A.K. Marchenko and B. Sartowska</i>	847	Liquid gallium jet-plasma interaction studies in ISTTOK tokamak, <i>R.B. Gomes, H. Fernandes, C. Silva, A. Sarakovskis, T. Pereira, J. Figueiredo, B. Carvalho, A. Soares, P. Duarte, C. Varandas, O. Lielais, A. Klyukin, E. Platacis, I. Tale and A. Alekseyev</i>	938
Section 8. Plasma facing materials/components, plasma heating steady-state operation and conditioning methods		Experimental studies of lithium-based surface chemistry for fusion plasma-facing materials applications, <i>J.P. Allain, D.L. Rokusek, S.S. Harilal, M. Nieto-Perez, C.H. Skinner, H.W. Kugel, B. Heim, R. Kaita and R. Majeski</i>	942
Impact of lithium-coated walls on plasma performance in the TJ-II stellarator, <i>J. Sánchez, F.L. Tabarés, D. Tafalla, J.A. Ferreira, I. García-Cortés, C. Hidalgo, F. Medina, M.A. Ochando, M.A. Pedrosa and The TJ-II Team</i>	852	Power deposition modelling of the ITER-like wall beryllium tiles at JET, <i>M. Firdaouss, R. Mitteau, E. Villedieu, V. Riccardo, P. Lomas, Z. Vizvary, C. Portafaix, L. Ferrand, P. Thomas, I. Nunes, P. de Vries, P. Chappuis and Y. Stephan</i>	947
Plasma-wall interaction and plasma behaviour in the non-boronised all tungsten ASDEX Upgrade, <i>R. Dux, V. Bobkov, A. Herrmann, A. Janzer, A. Kallenbach, R. Neu, M. Mayer, H.W. Müller, R. Pugno, T. Pütterich, V. Rohde, A.C.C. Sips and ASDEX Upgrade Team</i>	858	ICRF specific impurity sources and plasma sheaths in Alcator C-Mod, <i>S.J. Wukitch, B. LaBombard, Y. Lin, B. Lipschultz, E. Marmar, M.L. Reinke, D.G. Whyte and The Alcator C-Mod Team</i>	951
ICRF wall conditioning and plasma performance on EAST, <i>X. Gao, J.S. Hu, Y.P. Zhao, X.Z. Gong, Y.W. Yu, G.N. Luo, H.Y. Guo, S. Morita, L.Q. Hu, J.L. Chen, H.Y. Wang, X.M. Wang, X.D. Zhang, J.G. Li and The East team</i>	864	Study of heat flux deposition on the limiter of the Tore Supra tokamak, <i>S. Carpentier, Y. Corre, M. Chantant, R. Daviot, G. Dunand, J.-L. Gardarein, J. Gunn, M. Kocan, C. Le Niliot, R. Mitteau, V. Moncada, P. Monier-Garbé, B. Pegourié, C. Pocheau, R. Reichle, F. Rigollet, F. Saint-Laurent, J.-M. Travère and E. Tsitrone</i>	955
Particle control study towards burning plasma control in JT-60U, <i>H. Takenaga and The JT-60 Team</i>	869	Estimated RF sheath power fluxes on ITER plasma facing components, <i>L. Colas, D. Milanesio, E. Faudot, M. Goniche and A. Loarte</i>	959
Plasma-wall interactions and plasma behaviour in fusion devices with liquid lithium plasma facing components, <i>S. Mirnov</i>	876	Analysis for shaping the ITER first wall, <i>P.C. Stangeby and R. Mitteau</i>	963
The effects of high fluence mixed-species (deuterium, helium, beryllium) plasma interactions with tungsten, <i>M.J. Baldwin, R.P. Doerner, D. Nishijima, K. Tokunaga and Y. Ueda</i>	886	Development and qualification of a bulk tungsten divertor row for JET, <i>Ph. Mertens, H. Altmann, T. Hirai, V. Philipp, G. Pintsuk, J. Rapp, V. Riccardo, B. Schweer, I. Uytdenhouw and U. Samm</i>	967
Design, R&D and assessment of performance of the JT-60SA upper divertor, <i>S. Sakurai, H. Kawashima, S. Higashijima, K. Shimizu, K. Masaki, N. Asakura, Y.K. Shibama and A. Sakasai</i>	891	Simultaneous irradiation of tungsten with deuterium and carbon at elevated temperatures, <i>H.T. Lee and K. Krieger</i>	971
Engineering challenges of the JET ITER-like Wall, <i>V. Riccardo and on behalf of the ITER-like Wall Engineering Design and Manufacture Team</i>	895	Investigation of chemical phase formation in the ternary system beryllium, carbon and tungsten with depth-resolved photoelectron spectroscopy, <i>F. Kost, Ch. Linsmeier, M. Oberkofler, M. Reinelt, M. Balden, A. Herrmann and S. Lindig</i>	975
Operation of ICRF antennas in a full tungsten environment in ASDEX Upgrade, <i>VI. Bobkov, F. Braun, R. Dux, L. Giannone, A. Herrmann, A. Kallenbach, H.W. Müller, R. Neu, J.-M. Noterdaeme, Th. Pütterich, V. Rohde and ASDEX Upgrade Team</i>	900	Ion cyclotron wall conditioning in reactive gases on TEXTOR, <i>G. Sergienko, A. Lysoivan, V. Philipps, A. Kreter, C. Schulz, A. Huber, H.G. Esser, J.S. Hu, M. Freisinger, H. Reimer and U. Samm, the TEXTOR-team</i>	979
Measurement of lower hybrid hot spots using a retarding field analyzer in Tore Supra, <i>J.P. Gunn, V. Petřík, A. Ekedahl, V. Fuchs, E. Gauthier, M. Goniche, M. Kočan, J.-Y. Pascal and F. Saint-Laurent</i>	904	RF heated wall conditioning discharges in JT-60U, <i>K. Itami, N. Asakura, H. Tamai, S. Moriyama and A. Kaminaga</i>	983
Influence of toroidal and vertical magnetic fields on Ion Cyclotron Wall Conditioning in tokamaks, <i>A. Lysoivan, G. Sergienko, V. Rohde, V. Philipps, G. van Wassenhove, M. Vervier, V. Bobkov, J. Harhausen, R. Koch, J.-M. Noterdaeme, D. van Eester, M. Freisinger, H.-U. Fahrbach, H. Reimer, A. Kreter, D. Hartmann, J. Hu, R. Weynants, O. Gruber, A. Herrmann, D. Douai, Y.D. Bae, H.G. Esser, J.G. Kwak, E. Lerche, O. Marchuk, V. Mertens, R. Neu, U. Samm, A. Scarabosio, C. Schulz, S.J. Wang and TEXTOR Team and ASDEX Upgrade Team</i>	907	Testing of beryllium marker coatings in PISCES-B for the JET ITER-like wall, <i>A. Widdowson, M.J. Baldwin, J.P. Coad, R.P. Doerner, J. Hanna, D.E. Hole, G.F. Matthews, M. Rubel, R. Seraydarian and H. Xu, JET-EFDA Contributors</i>	988
On the consequences of neutron induced damage for volumetric fuel retention in plasma facing materials, <i>D.G. Whyte</i>	911	Testing of tungsten coatings in JET for the ITER-like wall, <i>J.P. Coad, D.E. Hole, E. Kolodinska, J. Likonen, S. Lindig, G.F. Matthews, M. Mayer, V. Philipps, V. Riccardo, A. Widdowson and JET-EFDA Contributors</i>	992
Effects of high heat flux hydrogen and helium mixture beam irradiation on surface modification and hydrogen retention in tungsten materials, <i>K. Tokunaga, T. Fujiwara, K. Ezato, S. Suzuki, M. Akiba, H. Kurishita, S. Nagata, B. Tsuchiya, A. Tonegawa and N. Yoshida</i>	916	Renewable boron carbide coating in plasma shots of tokamak T11-M, <i>O.I. Buzhinskij, V.A. Barsuk and V.G. Otroshchenko</i>	996
Evidence of radiation damage impact on material erosion in plasma environment, <i>B.I. Khripunov, A.N. Brukhanov, O.K. Chugunov, V.M. Gureev, V.S. Koidan, S.N. Kornienko, B.V. Kuteev, S.T. Latushkin, A.M. Muksunov, V.B. Petrov, A.I. Ryazanov, E.V. Semenov, V.P. Smirnov, V.G. Stolyarova and V.N. Unezhev</i>	921	Evaporated lithium surface coatings in NSTX, <i>H.W. Kugel, D. Mansfield, R. Maingi, M.G. Bell, R.E. Bell, J.P. Allain, D. Gates, S. Gerhardt, R. Kaita, J. Kallman, S. Kaye, B. LeBlanc, R. Majeski, J. Menard, D. Mueller, M. Ono, S. Paul, R. Raman, A.L. Roquemore, P.W. Ross, S. Sabbagh, H. Schneider, C.H. Skinner, V. Soukhanovskii, T. Stevenson, J. Timberlake, W.R. Wampler, J. Wilgren, L. Zakharov and The NSTX Team</i>	1000
CD ₄ production from mixed W-C-D surface during simultaneous irradiation of W with C ⁺ and D ⁺ , <i>I.A. Bizyukov, J.W. Davis, A.A. Haasz and P. Brodersen</i>	925	Mass changes in NSTX surface layers with Li conditioning as measured by quartz microbalances, <i>C.H. Skinner, H.W. Kugel, A.L. Roquemore, P.S. Krstic and A. Beste</i>	1005
Comparison of O-ICR wall conditionings for limiter configuration in HT-7 and divertor one in EAST, <i>J.S. Hu, J.G. Li, Y.P. Zhao and EAST Team</i>	929	Measurement of lithium and deuterium on NSTX carbon tiles, <i>W.R. Wampler, C.H. Skinner, H.W. Kugel and A.L. Roquemore</i>	1009
Development of divertor tungsten coatings for the JET ITER-like wall, <i>G.F. Matthews, P. Coad, H. Greuner, M. Hill, T. Hirai, J. Likonen, H. Maier, M. Mayer, R. Neu, V. Philipps, R. Pitts, V. Riccardo and JET-EFDA Contributors</i>	934	Impurity production monitoring during RF experiments in Tore Supra, <i>O. Meyer, P. Monier-Garbé, P. Devynck, A. Ekedahl, P. Oddon, B. Pegourié and S. Vartanian</i>	1013
Deuterium retention, blistering and local melting at tungsten exposed to high-fluence deuterium plasma, <i>W.M. Shu, M. Nakamichi, V.Kh. Alimov, G.-N. Luo, K. Isobe and T. Yamanishi</i>		Deuterium retention, blistering and local melting at tungsten exposed to high-fluence deuterium plasma, <i>W.M. Shu, M. Nakamichi, V.Kh. Alimov, G.-N. Luo, K. Isobe and T. Yamanishi</i>	1017
A Geometrical approach to evaluating the heat flux peaking factor on first wall components, <i>R. Mitteau and P. Stangeby</i>		Innovative tokamak DEMO first wall and divertor material concepts, <i>C.P.C. Wong</i>	1022
A study of hydrogen blistering mechanism for Molybdenum by Tritium radio-luminography, <i>T. Hoshihira, T. Otsuka and T. Tanabe</i>			1026
			1029

Structure, stability and diffusion of hydrogen in tungsten: A first-principles study, <i>Y.-L. Liu, Y. Zhang, G.-N. Luo and G.-H. Lu</i>	1032	Development of an in situ ITER dust diagnostic based on extinction spectrometry: Dedicated light scattering models, <i>F. Onofri, K.F. Ren and C. Grisolia</i>	1093
Low-energy particle interaction at carbon nanowalls on W surface, <i>N. Tanaka, H. Yamaoka, M. Nishiura, K. Tsumori, T. Nagamura, M. Sasao, T. Kenmotsu, Y. Matsumoto and M. Wada</i>	1035	Temperature measurement of plasma-facing surfaces in tokamaks by active pyrometry, <i>V. Grigorova, A. Semerok, D. Farage, J.M. Weuldersse, P.Y. Thro, E. Gauthier, H. Roche, Th. Loarer and Ch. Grisolia</i>	1097
Microstructural evolution in tungsten and copper probes under hydrogen irradiation at ISTOK, <i>D. Nunes, R. Mateus, I.D. Nogueira, P.A. Carvalho, J.B. Correia, N. Shohoji, R.B. Gomes, H. Fernandes, C. Silva, N. Franco and E. Alves</i>	1039	Ion-induced erosion of tungsten surfaces studied by a sensitive quartz-crystal-microbalance technique, <i>A. Golczewski, A. Kuzucan, K. Schmid, J. Roth, M. Schmid and F. Aumayr</i>	1102
Physical erosion studies of plain and lithiated graphite, <i>M. Racic, K. Ibano, R. Raju and D.N. Ruzic</i>	1043	A parameterization of the Lyman α and Lyman β line shapes for radiation transport simulations in divertor plasmas, <i>J. Rosato, D. Reiter, H. Capes, S. Ferri, L. Godbert-Mouret, M. Koubiti, Y. Marandet and R. Stamm</i>	1106
Hydrogen and helium removal retained in stainless steel by neon glow discharge, <i>Y. Yamauchi, K. Takeda, Y. Nobuta and T. Hino</i>	1048	A sodium (Na) beam edge diagnostic, <i>E. Wolfrum, J. Schweinzer, D. Bridi, K. Igenbergs, J. Kamleitner, F. Aumayr and ASDEX Upgrade Team</i>	1110
ECR discharge cleaning and followed He GDC on HT-7 tokamak, <i>Y.W. Yu, X. Gao, J.S. Hu, J.G. Li, J.F. Shan and The HT-7 Team</i>	1051	Direct measurements of the plasma potential in ELMY H-mode plasma with ball-pen probes on ASDEX Upgrade tokamak, <i>J. Adamek, V. Rohde, H.W. Müller, A. Herrmann, C. Ionita, R. Schirritwieser, F. Mehlmann, J. Stöckel, J. Horacek, J. Brotankova and ASDEX Upgrade Team</i>	1114
Thermocapillary and thermoelectric effects in liquid lithium plasma facing components, <i>M.A. Jaworski, N.B. Morley and D.N. Ruzic</i>	1055	Thermal response to heat fluxes of the W7-AS divertor surface submitted to surface modification under high temperature treatment, <i>D. Hildebrandt, A. Dübner, H. Greuner and A. Wiltner</i>	1118
Section 9. Plasma diagnostics		Impurity control in a tokamak edge plasma by a method of Doppler-free spectroscopy, <i>S. Bychkov, A. Nedospasov and G. Sergienko</i>	1123
Progress in diagnostics for characterization of plasma wall interaction in tokamaks, <i>E. Gauthier</i>	1059	On the determination of edge Ti profiles by a supersonic He beam in TJ-II, <i>F. Guzmán, F.L. Tabarés, D. Tafalla, I. García Cortés and R. Balbín</i>	1127
An overview of a comprehensive First Mirror Test for ITER at JET, <i>M. Rubel, G.D. Temmerman, P. Sundelin, J.P. Coad, A. Widdowson, D. Hole, F. Le Guern, M. Stamp, J. Vince and JET-EFDA Contributors</i>	1066	Application of optical techniques for in situ analysis of plasma facing carbon tiles, <i>H. Nakazato, M. Yoshida, T. Tanabe, K. Masaki, N. Miya and M. Sato</i>	1131
Determination of a thermal property of carbon layers from IR measurements in JET NBI test bed using optimisation methods, <i>R. Daviot, E. Gauthier, S. Carpentier, Y. Corre, J.L. Gardarein and JET EFDA Contributors</i>	1070	Reactivity of rhodium during co-deposition of rhodium and carbon, <i>L. Marot, R. Steiner, G. De Temmerman and P. Oelhafen</i>	1135
Measurements of scrape-off layer ion-to-electron temperature ratio in Tore Supra ohmic plasmas, <i>M. Kočan, J.P. Gunn, J.-Y. Pascal, G. Bonhomme, P. Devynck, I. Ďuran, E. Gauthier, P. Ghendrih, Y. Marandet, B. Pegourie and J.-C. Vallet</i>	1074	Dimple optimization for XPS characterization of TEXTOR tile depositions, <i>I. Uytdenhouwen, S.M. González de Vicente, J.P. Coad, W. Van Renthergem, S. Van den Berghe, G. Van Oost and V. Massaut</i>	1138
Interpretation of spatially resolved helium line ratios on MAST, <i>S. Lisgo, P. Börner, G.F. Counsell, J. Dowling, A. Kirk, R. Scannell, M. O'Mullane, D. Reiter and MAST Team</i>	1078	Investigation of C IV line broadening mechanisms for plasma diagnostics in magnetic fusion devices, <i>M. Koubiti, T. Nakano, H. Capes, S. Ferri, L. Godbert-Mouret, Y. Marandet, J. Rosato and R. Stamm</i>	1142
Concept and development of ITER divertor thermography diagnostic, <i>R. Reichle, Ph. Andrew, C. Balorin, B. Brichard, S. Carpentier, Y. Corre, M. Davi, R. Daviot, C. Desgranges, J.L. Gardarein, E. Gauthier, D. Guilhem, S. Gicquel, A. Herrmann, D. Hernandez, M. Jouve, Ch. Le Niliot, Th. Loarer, A. Martin, J.P. Martins, J.-B. Migozzi, J.P. Patterlini, C. Pocheau, F. Rigollet, H. Roche and J.M. Travere</i>	1081	Design status of ITER visible/IR outer strike point view, <i>C.J. Lasnier, L.G. Seppala, K. Morris, M.E. Fenstermacher and M. Groth</i>	1145
Electrostatic dust detector for fusion devices with improved sensitivity, <i>D.P. Boyle, C.H. Skinner and A.L. Roquemore</i>	1086	In situ reflectivity of tungsten mirrors under helium plasma exposure, <i>W. Sakaguchi, S. Kajita, N. Ohno and M. Takagi</i>	1149
Tokamak and laboratory modeling of hydrocarbon film deposition on metallic mirrors, <i>K.Y. Vukolov, I.I. Arkhipov, T.R. Mukhammedzyanov and S.N. Zvonkov</i>	1090	Author index	1153