



EFDA-JET Bulletin

JUNE 2001 2/1

Message from the EFDA Associate Leader for JET



JEROME PAMELA

The success of the first year of experimental campaigns on JET under EFDA has been made possible by the strong involvement of all the parties involved, the Associations, the EFDA Close Support Units and the Operator. The experimental campaigns have had excellent scientific results, including demonstration of ITER-like scenarios, an increased understanding of ELM-physics, the stabilisation of neoclassical tearing modes and the successful use of LH with improved coupling leading to significant progress in advanced scenarios. The high level of availability of the machine subsystems, ensured by the dedication of the "on the ground staff", has been key to producing an enormous scientific output. Previous EFDA-JET Bulletins have illustrated the role and participation of the Associations and their physicists. This has greatly helped in developing a solid European partnership around JET, thereby anticipating the spirit of the European Research Area proposed by the EU Commission for the 6th Framework Programme. The present bulletin is fully dedicated to the Operator work. The restart of the operation of the JET facilities under the new EFDA arrangements after 1 January 2000 was a significant challenge, and successfully achieved. The dedication of UKAEA staff working under the JET Operation Contract has provided excellent operational conditions which have been essential for the successful conduct of the experimental programme.

Message from the Operations Director



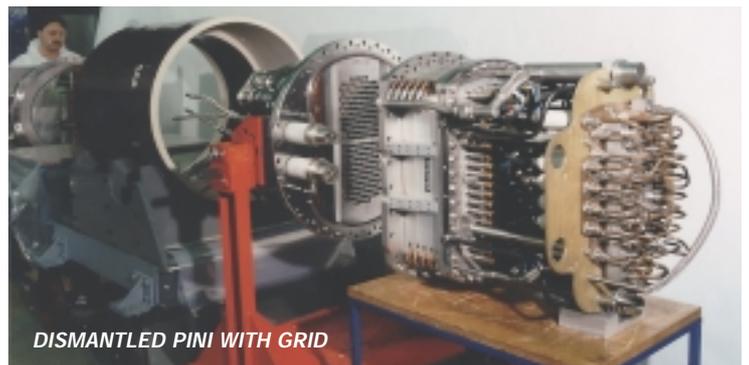
FRANK BRISCOE

The UKAEA 'operations' staff have worked very hard over the first 15 months of JET under EFDA in support of the overall programme. Highlights include: restart – the first big restart was completed on schedule last May (and one small one in August); experimental campaigns – about 150 days of good operation have been achieved during the first 4 campaigns, with only 12 'lost' days; response to equipment failures - there has been a fast response in order to minimise the disruption to the planned programme from a wide range of faults including a water leak on NIB4, the failure of a Normatex pump, and an air leak on KE4 diagnostic; enhancements – there has been a big effort to support the implementation of a number of current enhancements including the Octant 8 NB upgrade and the planning of the JET-EP; 'Operator Projects' – two major projects are now well advanced, namely the replacement of the freon TF coil coolant and the replacement of the IBM computer system; shutdown – extensive preparations have been made for the major 2001 shutdown which is now underway; S/T Secondee support – a wide range of services have been provided to over 200 individual secondees over the first 4 campaigns; safety – there has been a good safety performance with few serious incidents and much progress in adopting the UKAEA safety management system. The following articles give further information on some of these aspects of JET Operation.

LATEST NEWS

FIRST DELIVERY OF NEW COMPONENTS FOR MAJOR JET NEUTRAL BEAM UPGRADE UNDER EFDA

The first delivery of new components manufactured under an EFDA-JET Article 7 contract with industry took place recently. Water-cooled accelerator grids manufactured by Galvano-T GmbH for two upgraded Positive Ion Neutral Injectors (PINIs) were delivered to Culham in April as part of the JET Neutral Beam Enhancement Project. This project was set up under EFDA in late 1999, with UKAEA as lead Association, and the grid manufacturing contract was let on December 18, 2000. A total of nine sets of these grids will be delivered in four batches, the last batch scheduled for delivery next August. When all eight upgraded PINIs are operating, it will result in approximately double the power from the Octant 8 neutral beam injector. This is scheduled for the latter part of 2002, after delivery and commissioning of new HV power supplies.



DISMANTLED PINI WITH GRID

OPERATIONS UNDER EFDA

The first plasma of the first campaign under EFDA took place on the 31 May 2000 as originally planned. Four experimental campaigns were then successfully conducted in 2000-2001, totalling 152 operation days. The reliability and performance of the JET systems were very good



THE FOUR LATEST ENGINEERS IN CHARGE

during the four campaigns. The few failures of equipment have resulted in a total of only 12 days being lost out of a total of 164 days of operation, with half of this lost time arising from a vacuum leak caused by the failure of a weld on the microwave scattering diagnostic.

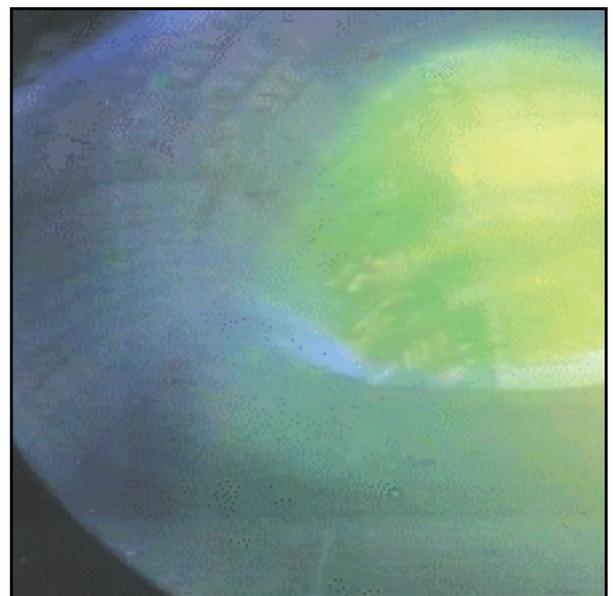
The Engineer-in-Charge (EiC) manages the operational shifts in the J2 Control Room. He has the difficult task of aiming to satisfy the experimental requirements of the task forces, while ensuring JET is operated within prescribed safe limits. By effectively co-ordinating the subsystem operators he ensures the efficient and effective use of operational time. This year has seen the appointment of four new EiCs who have successfully completed the almost year long training course. They are now familiar faces in the J2 Control Room and form part of the team of over 120 staff who are rostered on shift to run the JET machine. Some of these operational staff may be able to take a break in the current shutdown but most are just as busy with shutdown work and preparing the machine for C5 in 2002!

CODAS – CONTROL AND DATA ACQUISITION SYSTEMS

In recent years CODAS' role has expanded from purely operations-related software and hardware to include the IBM mainframe and JET Analysis Cluster (JAC) system administration, the site-wide PC network and email systems, the Internet connections, computer security and remote participation. During the 2000 Spring restart and Campaigns 1, 2 and 3 priority was given to maintaining and improving the support for Tokamak operations and responding to new requirements as they arose. In parallel there was also heavy involvement with: UKAEA network integration; support of the CSU – including the EFDA-JET web pages; support for the EFDA Secondees – especially the thin-client desktop solution; preparation for the small enhancements and the JET-EP; the IBM replacement project and various aspects of remote participation.

2001 will also be a busy year. Shutdown work, after the end of C4 includes: substantial RF generator cubicle rewiring; the software and hardware changes associated with the Freon replacement project; preliminary work on the neutral beam power supplies upgrade and some of the associated protection systems; a general move towards ATM on the real-time systems; the incorporation of more diagnostics in the real-time systems and work associated with the small enhancements.

Other activities include the IBM replacement project, which will reach completion by the end of June; the rewiring of the K1, J2 and J20 local networks to provide 100Mbits/s to the desktop and 1Gbits/s from distribution cubicles back to the J2 computer room; the installation of videoconferencing equipment in the HOW room, a smaller conference room and two office size rooms; the continuation of JET-EP design work - hopefully making extensive use of the videoconferencing facilities – and the development of a new 2MHz ADC to be used by several of the JET-EP diagnostics. In addition, training courses are planned here at JET in aspects of remote participation for the technical experts from the Associations.



A DIGITISED VIEW OF THE KL1 WIDE ANGLE CAMERA VIEW, SHOWING A STRONG INTERNAL TRANSPORT BARRIER (ITB) DURING PULSE NO: 51976

2001 JET FACILITIES SHUTDOWN

The C4 operational campaign ended on Friday 30th March 2001 allowing the vessel to cool and machine isolation. Operations will recommence on Monday 4th March 2002. The shutdown consists of extensive work both within the Torus (in-vessel) and on the outside of the machine (ex-vessel). The vast majority of in-vessel tasks will be completed remotely for which comprehensive mock-up trials and training began in earnest in November. Limited periods of manned access to the Torus will also be required. This will be carried out in air fed full-pressurised suits to provide the appropriate respiratory protection for the workforce. The main in-vessel tasks consist of modifications to the divertor (removal of Septum and installation of Septum Replacement Plate), reinforcement / installation of additional protection on the upper inner saddle coils, deposition sample replacement, divertor wiring checks, sub-divertor tritiated dust/flake retrieval and refurbishment / installation of diagnostics on the outer and inner walls.

Ex-vessel activities include a significant number of both enhancement tasks and operator improvements. The main tasks being replacement of the Toroidal Field cooling fluid, upgrades on both Neutron Injector Beams (installation of new box scrappers and improved PINIs), installation of Error Correction Field Coils, turbo pump upgrades, various diagnostic and cryogenics modifications. The 2001 shutdown will be the largest since the installation of the MK2 divertor structure in 1996 and the Remote Tile Exchange in 1997.



CRANE HANDLING PINI IN TORUS HALL

THE SECONDEE ASSISTANCE TEAM (SAT)

The SAT Team was established jointly by UKAEA and the CSU as a central focus for administrative and logistic assistance to Secondees coming to JET for the experimental campaigns. The team begin preparations for a campaign about 6 weeks ahead when the CSU provides details of the Secondees expected during the campaign. They progress all Secondment Agreements, resolve queries and begin preparations for the administration of payments on behalf of the Commission. Room and desk allocations are made for each Secondee and PC Support ensure that the necessary arrangements are in place for IT access. During the C4 campaign approximately 113 Secondees visited the JET Facilities, whereas the total for campaigns C1 to C4 was close to 240. In advance of each visit SAT staff progress security clearance and pass applications for new Secondees so that they can obtain IT and site access with minimal delay. On arrival Secondees are given a brief introduction to the JET Facilities, necessary paperwork is completed, room, desk keys and computers are allocated/handed out. During the Secondees stay the SAT Team are available to answer enquiries both about secondment matters and about local information. There is also a vast amount of information available on the EFDA JET users website.



THE SAT STAFF

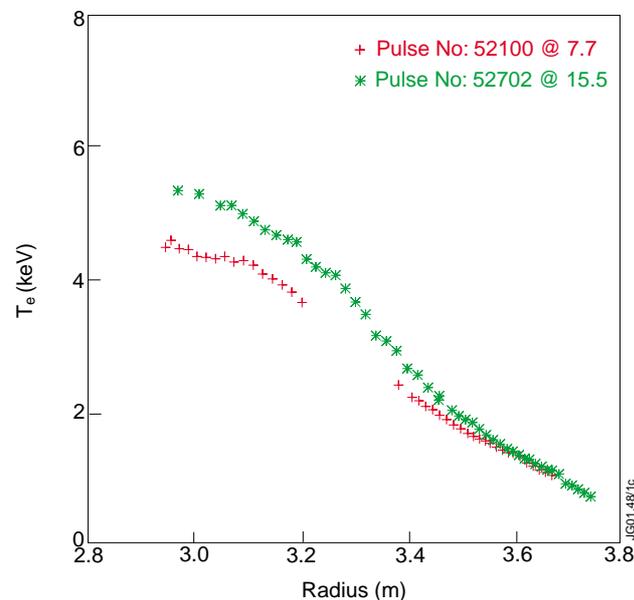
ENHANCED DIAGNOSTIC PERFORMANCE UNDER JOC (JET OPERATING CONTRACT)

The operator has a responsibility under JOC to support a large number of diagnostic systems. The level of support ranges from basic maintenance to full scientific exploitation including analysis and interpretation of data. A review of JET diagnostic capabilities at the start of the contract highlighted a number of areas where improved diagnostic performance would assist the Task Forces to meet their scientific objectives. Some of these enhancements were established as EFDA projects involving several of the Associations. The operator is involved in all these projects to fulfill its responsibilities for interfaces such as safety, vacuum, data acquisition etc. A small number of enhancements were identified as being more appropriately developed by the operator alone. These were generally modest improvements or changes to improve the effectiveness of working systems for which the operator had responsibility for full exploitation (*continued on back page*).

Some of the modifications originally planned have been overtaken by other changes in the task force requirements or by alternative ways of achieving the same objectives, but some of the enhancements have been completed or, where in-vessel access is required will be implemented during the 2001 shutdown. An early improvement to diagnostic capability, strongly requested by all the task forces, was an extension of the fast sampled data window of the KC1D magnetic coils. After some development by CODAS staff a constant 2.5KHz sampling rate has been achieved for as long as 18 seconds during the JET pulse. Further enhancement in either sampling rate or record length will require significant hardware changes.

The in vessel arrays of magnetic diagnostics are important, both for machine operation and protection and for determining the plasma equilibrium. Over the lifetime of the JET experiment, a number of these Rogowski coils and 3 new halo current coils will be installed on the upper inner wall protection. The measurement and understanding of structural halo currents has important implications for ITER design.

Electron temperature profiles in JET discharges can be determined from electron cyclotron emission using a multichannel heterodyne radiometer. This diagnostic, KK3, for some JET conditions has had a gap in the profile measurement. For an axial toroidal field of 2.9T there is no measurement of T_e in the range $r/a=0.5$ to 0.8 . A small enhancement under JOC allows data to be obtained in this gap. A new microwave mixer and local oscillator have been purchased increasing the bandwidth from 6 GHz to 12 GHz. As a result signals appear on the 8 channels whose IF filters cover this range as can be clearly seen in the example which shows a recent shot compared to one before the enhancement.



IMPROVED ELECTRON TEMPERATURE PROFILES

PUBLICATIONS

Since the last bulletin major international conferences have attracted a considerable number of conference papers. The number of publications in scientific journals is also on the increase after this first year of JET activities under EFDA. Over 90 EFDA papers have been presented to EPS 2001. This large number can certainly only partially be explained by the attractive Conference site of Madeira, Portugal. The main conclusion must be that due to the strong involvement of the Associations the first year of operation of the JET facilities under EFDA has been a great scientific success.

The list of publications is given on separate sheets of paper allowing separate filing.

VISITORS BOOK

Over 450 visitors have been welcomed to the JET facilities during the autumn/winter months. These included Sergei Kapitsa, Vice-Chairman of the Academy of National Sciences of Russia; G Caudron, MEP and rapporteur for the Sixth Framework Programme FP6; M Le Chatelier, Head of the Cabinet and Minister for Research; the Belgian Nuclear Society; a high-level delegation representing the Finnish Industry and Research; journalists from the BBC and professional journals; 260 schoolchildren from nearby counties attending a Campaign to Promote Engineering held at JET and the usual wide range of visitors from universities, schools and the general public.

EFDA Bulletin published by the EFDA-JET CSU and UKAEA

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EFDA-JET Publications List

The following is a list of papers cleared for publication by the EFDA-JET Associate Leader. Only papers which have not already been reported in earlier bulletins are listed. Note that journal papers have not necessarily been published yet, but conference papers are only listed if the relevant conference has taken place.

Papers Presented at Conferences

Symposium on Fusion Technology - 2000, Madrid, Spain, 11-15 September 2000

- Tritium depth profile in graphite and carbon fibre composite material pre-exposed to tokamak plasmas, *R D Penzhorn*

Combined workshop of the ITER Physics Expert Groups (Pedestal phys., divertor , MHD, disruption ctrl), Garching, 11-13 October 2000

- Impact of ELMs on the divertor in AUG and JET, *G F Matthews*

Internat. workshop on heating in tokamaks and transport, Frascati, 11-13 October 2000

- JET database on the relationship between q-profile, heating and ITBs, *Y F Baranov*

IEA Workshop: Fuelling: Core and Edge Density Control, Princeton, 30-31 October 2000

- Initial results on pellet penetration and mass re-combination at JET, *S A Cox*

TOKI Conference, Japan, 5-8 December 2000

- Rational surfaces, ExB sheared flows and transport interplay in fusion plasmas, *C Hidalgo*

European Fusion Physics Workshop, Leysin, CH, 14 December 2000

- Cold Pulse Propagation and Transient Transport Improvement in Toroidal Plasmas, *G Gorini*
- Modelling transients with turbulent transport models, *Y Sarazin et al*
- MHD Studies in JET, *O Sauter*
- Observations on transport of ELMy H-mode plasmas in ASDEX Upgrade and JET, *W A Suttrop*
- JET under EFDA: First results and future plans, *M L Watkins et al*

ANS Conference on Remote Handling in Hostile Environments, Seattle USA, 4-8 March 2001

- A Rational approach to Remote Handling equipment control system design, *B Haist et al*
- Development of the Mascot telemanipulator control system, *D T Hamilton et al*
- Remote Maintenance of an Operational Fusion Experiment, *A B Loving et al*

28th Annual IoP Plasma Physics Group Conference, Manchester , 2-5 April 2001

- Spectral line ratios for Alpha particle concentration, *T F O'Neill et al*

AUG Programme Workshop, Garching, 19-20 April 2001

- Towards Identity ITB Experiments ASDEX-Upgrade: JET, *C D Challis*
- Possibilities for collaborative edge/divertor programmes between JET and AUG, *G F Matthews*
- Motivation for JET-AUG comparisons, *J Pamela*
- JET methane screening, *J D Strachan et al*

International Meeting and Combined ITER Expert Group Meeting, Garching, 23-27 April 2001

- JET ITB database on relation between global and local parameters, *Y F Baranov et al*
- JETTO-Predictive Modelling of Double-ITB JET Plasmas, *V Parail et al*

Burning Plasma Science Workshop II, San Diego, 1-3 May 2001

- JET DT Plans to end 2006, *D Stork*

Conference on displays and vacuum electronics, Garmisch-Partenkirchen, 2-4 May 2001

- The ECRH system for JET-EP, *T M Verhoeven et al*

14th Topical Conference on Radio Frequency Power in Plasmas, Oxnard, 7-9 May 2001

- Modelling of antenna-plasma interactions for monopole-dipole operation applied to the JET A2 antennas, *D A D'Ippolito et al*
- JET-EP ITER-like ICRH antenna, *F Durodie et al*
- Theoretical and experimental analysis of the LHCD power coupling in JET optimised shear plasmas, *A C Ekedahl et al*
- Coupling of the JET ICRH A2 antennas in the divertor configuration Mark II GB, *D Hartmann et al*
- Effects of finite drift orbit width and RF-induced spatial transport on plasmas heated by ICRH, *T A K Hellsten et al*
- RF-induced pinch of resonating ³He minority ions in JET, *T Johnson et al*
- Commissioning of the wideband matching system for ICRH of ELMy JET plasmas, *P Lamalle et al*
- ICRF Heating Scenarios in JET with emphasis on He plasmas for the non-activated phase of ITER, *M J Mantsinen et al*
- Sawtooth and neoclassical tearing mode seed island control by ICRF current drive on JET, *M H R Mayoral et al*
- Comparison of FWCD scenarios on ASDEX-Upgrade, JET, and DIII-D tokamaks, *F Meo et al*
- Spatially resolved plasma rotation profiles with ICRF on JET, *J Noterdaeme et al*
- LHCD coupling during H-mode and ITB in JET plasmas, *V Pericoli Ridolfini et al*
- Influence of plasma proximity to the vessel on the L-H transition in JET ICRF heated plasmas, *E Righi*
- Recent heating and current drive result on JET, *A A Tuccillo et al*

Belgian Physical Society Meeting, Leuven, 16-17 May 2001

- From JET to ITER: Preparing the next step in fusion research, *J Pamela*
- Recent minority He and mode conversion heating experiments in JET, *D Van Eester*

European-US Task Force Meeting on Transport, Fairbanks, 16-19 May 2001

- Microturbulence in High-Performance JET ITB plasma, *R V Budny et al*
- Experimental Studies of Wave-Particle Interaction on the JET Tokamak, *A F Fasoli et al*
- Perturbative Transport Studies in JET Optimised Shear Plasmas, *P Mantica et al*
- Predictive Modelling of JET plasmas with edge and core transport barriers, *V Parail et al*

Complex Systems Dynamics, Fairbanks, 21-23 May 2001

- Radial structure of fluctuations and transport in the JET plasma boundary region, *C Hidalgo et al*

12th IEEE-NPSS Real Time Conference, Valencia, Spain, 4-8 June 2001

- Remote Participation Infrastructure in the European Fusion Laboratories, *V Schmidt et al*

HITEN 2001, Oslo, 5-8 June 2001

- High temperature quartz micro-balance for the measurement of deposition inside an experimental fusion reactor, *G F Neill*

28th EPS Conference on Controlled Fusion and Plasma Physics, Madeira, Portugal, 18-22 June 2001

- JET progress towards an advanced mode of ITER operation with current profile control, *A Becoulet*
- Influence of Edge Current Profile on Type III-Type I ELMs Transition in Optimised Shear Discharges on JET, *M Becoulet*

- Analysis of plasma edge profiles at JET, *M N A Beurskens*
- Modelling of the Radiative damping of Alfvén Eigenmodes in JET with the CASTOR-K code., *D N V F M Borba et al*
- Recent H-mode density limit studies on JET, *K E Borrass*
- Determination of Edge Density Profiles in JET using a 50KV Lithium Beam, *M Brix*
- Particle balance studies in JET, *J Bucalossi et al*
- Comparison of Theory of ICRH-induced Torques with Measurements of Rotation in JET Plasmas, *R V Budny*
- Rotation and Shape dependence of Neoclassical Tearing Mode thresholds on JET, *R Buttery*
- High Fusion performance in JET plasmas with highly negative central magnetic shear, *C D Challis*
- Carbon migration due to SOL flow in JET, *J P Coad et al*
- Turbulence behaviour during electron heated reversed shear discharges in JET, *G Conway*
- Energy Confinement in Steady State ELMy H-modes in JET, *J G Cordey*
- JET and ASDEX Upgrade Divertor Modeling, *D Coster et al*
- Confinement properties of high density impurity seeded ELMy H-mode discharges on JET, *P Dumortier et al*
- Analysis of Impurity Behaviour in ITB discharges with Reversed and Monotonic Shear at JET, *R Dux*
- Analysis of power deposition in JET MKIIGB divertor by IR-thermography, *T Eich*
- Correlation between magnetic shear and ExB flow shearing rate in JET ITB discharges, *B Esposito*
- Time-frequency analysis of fusion plasma signals using discrete Wigner distributions, *A C A Figueiredo et al*
- Experiments on helium compression and enrichment at JET, *K Finken*
- Formation Condition of Internal Transport Barrier, *T Fukuda*
- Power Exhaust in JET MKIIGB ELMy H-modes, *W Fundamenski*
- Distribution of carbon impurity sources between low and high field side measured via Zeeman-spectroscopy in JET, *J Gafert et al*
- Neon transport in JET plasmas at high performance and close to ITB formation., *C Giroud et al*
- Peripheral Plasma Perturbations and Transient Improved Confinement in JET Optimized Shear Discharges, *G Gorini*
- High Confinement Regime in the presence of (3,2) Neoclassical Tearing Modes, *S Guenter et al*
- Extreme Shear Reversal in JET Discharges, *N C Hawkes*
- Sawtoothing in Reversed Shear Plasmas, *T A K Hellsten*
- MHD performance limits in JET Optimised Shear Discharges, *P Hennequin*
- Neutron Emission Spectroscopy study of JET DT discharges subjected to RF (H) heating and NB Blips, *H O I Henriksson et al*
- On the radial scale of turbulent transport in JET, *C Hidalgo et al*
- Electron heated Internal Transport Barriers in JET, *G M D Hogewij*
- Reconstruction of 2-D line radiation distributions in the JET MKIIGB Divertor using CCD camera tomography, *A Huber*
- Radiation Distribution and Neutral-particle loss in high-density plasmas in the JET MKIIGB divertor, *L C Ingesson*
- Influence of impurity seeding on ELM behaviour and edge pedestal in ELMy H-Mode discharges, *S Jachmich*
- Novel method to study SOL-response to ELMs by divertor target probes in JET, *S Jachmich et al*
- Comparison of L-mode regimes with enhanced confinement by impurity seeding in JET and DIII-D, *G Jackson*
- Similar advanced tokamak experiments in JET and ASDEX Upgrade, *E Joffrin*
- Simulation of alpha particle plasma self-heating using ICRH under real-time control, *T T C Jones*
- Comparison of the H-mode pedestal density and its underlying physics in JET and ASDEX Upgrade, *A Kallenbach et al*

- Modelling of carbon erosion and deposition in the divertor of JET, *A Kirschner*
- Comparison of ExB flow shear in JET and ASDEX Upgrade by Monte Carlo simulations, *T P Kiviniemi et al*
- MHD studies in radiating mantle plasmas on JET, *H Koslowski et al*
- Observation of the palm tree mode, a new MHD mode excited by type-I ELMS on JET, *H Koslowski*
- Optimisation of pellet scenarios for long pulse fueling to high densities at JET, *P T Lang*
- Particles and power fluxes during an ELM observed by probes in the targets of the divertors of ASDEX Upgrade and JET, *M Laux et al*
- On rotation effects on error field locked modes, modelling and scaling law predictions, *E Lazzaro*
- Full current drive operation at high beta-poloidal in JET, *X Litaudon*
- Type I Edge Localised Mode Energy and Particle losses in JET ELMy H-modes, *A Loarte*
- The Effects of Target Density, Plasma Shaping and Divertor Configuration on the H-mode Pedestal in ITB Experiments on JET, *P J Lomas*
- ELM moderation in high density H-modes on JET and Alcator C-Mod, *G P Maddison*
- Use of Lower Hybrid Current Drive and Heating in Optimised Shear plasmas in JET, *J Mailloux*
- Cold Pulse Propagation Experiments in ITB Plasmas of JET, *P Mantica*
- ICRF mode conversion experiments on JET, *M J Mantsinen et al*
- Analysis of ion cyclotron current drive at $w \sim 2w_{ch}$ for sawtooth control in JET plasmas, *M J Mantsinen*
- Density dependence of the onset of neoclassical tearing modes in H-mode and pellet refueled discharges in JET and ASDEX Upgrade, *M E Maraschek et al*
- Densification of the peripheral scrape-off layer by CD, puffing and its application to LHCD coupling in JET, *G F Matthews et al*
- Real-time plasma control of internal transport barriers in JET, *D Mazon*
- Numerical simulation of sawtooth stabilisation by super-thermal particles in the potato regime, *F J R Nabais et al*
- Sawtooth and Impurity Accumulation Control in JET Radiative Mantle Discharges, *M F Nave*
- ICRF Current Drive Experiments on JET, *F Nguyen*
- Toroidal plasma rotation with ICRF on JET, *J Noterdaeme*
- Recent progress on JET towards the ITER reference mode of operation at high density, *J P H E Ongena*
- Predictive Modelling of JET Plasmas with Edge and Core Transport Barriers, *V Parail*
- First results from Helium plasma operation in JET, *V Philipps et al*
- Main Chamber Neutral Pressure in Alcator C-Mod and JET, *S Pitcher*
- Sawtooth stabilisation by neutral beam-injected fast ions in JET, *A Pochelon*
- Measurement of line emission profiles of fast helium beams and their application to plasma diagnostics, *M Proschek et al*
- Radiation pattern of impurity seeded ELMy H-mode discharges in JET: relation with confinement, *M Puiatti*
- Effect of Wall Temperature and Divertor Closure on the L-mode Density Limit at JET, *J Rapp*
- Studies of material transport in the Scrape-off Layer Plasma of JET investigated by means of surface analysis on reciprocating probes, *M Rubel et al*
- The effect of Plasma shape on density and confinement of ELMy H-Modes in JET, *G R Saibene*
- Improvement of LH-power coupling in H-mode and ITB plasmas at JET, *Y Sarazin*
- Edge Operational Space for High Density/High Confinement ELMy H-Modes in JET, *R I A Sartori*
- First Core Poloidal Flow Velocity Measurements in JET, *F Sattin*
- Neoclassical Tearing Mode Seed Island Control with ICRF in JET, *O Sauter*
- Beam afterglow scenario for TAE excitation in Optimised Shear JET plasmas, *S Sharapov*

- Alfvén cascades in JET discharges with non-monotonic $q(r)$, *S Sharapov*
- Fluctuations measurements using single Langmuir probe characteristic, *C G Silva et al*
- Orbit-following Monte Carlo simulation of divertor load distributions in JET, *S K Sipilä et al*
- Long-term Tritium Trapping in TFTR and JET, *C H Skinner et al*
- Screening of Hydrocarbon Sources in JET, *J D Strachan*
- Effect of Heat Flux and Density Variation on Transport in JET ELMs, H-Modes, *W A Suttrop*
- Impact of Different Preheating Methods on q -profile Evolution in JET, *T J J Tala et al*
- Measurement of the Damping Rate of Stable AEs on the JET Tokamak in Limiter and Diverted Plasmas with Monotonic and Mon-Monotonic q -Profiles, *D Testa et al*
- Energetic Particle Modes in JET Optimized Shear Experiments with Non-Monotonic q -Profiles, *D Testa et al*
- Alpha Heating of Thermal Ions in JET, *P Thomas et al*
- Predictive Modeling of Impurity seeded Plasmas in JET, *M Tokar et al*
- Characterization of internal transport barriers in JET and simulations of control algorithms, *G Tresset et al*
- Effect of internal flux shaping in JET transport barrier, *O Tudisco*
- Long time-scale density peaking in JET, *M Valovic*
- Influence of electron heating on confinement in JET and ASDEX Upgrade internal transport barrier plasmas, *R C Wolf et al*
- On the Amplitude of Sawtooth Pre-cursors at the Onset of Neo-Classical Tearing Modes, *P C da Silva Aresta Belo*
- Analysis of shaping effects on sawteeth in JET, *P de Vries et al*

Papers submitted to Journals

- Techniques for measuring the plasma radial electric field using the motional Stark effect diagnostic at JET, *S D A Reyes Cortes et al*, Czechoslovak Journal of Physics
- Impurity transport with strong and weak internal thermal barriers in JET optimised shear plasmas, *H Chen*, Nuclear Fusion
- Helium and neon enrichment studies in the JET MKII AP and MKII GB divertor, *M Groth et al*, Nuclear Fusion
- On the link between ExB sheared flows and rational surfaces in fusion plasmas, *C Hidalgo et al*, Nuclear Fusion
- Effect of ELMs on the measurement of vertical plasma position in TCV and JET, *F Hofmann et al*, Nuclear Fusion
- MHD Internal Transport Barrier triggering in low positive shear scenario in JET, *E Joffrin et al*, Nuclear Fusion
- Scaling of the pedestal density in type-I ELMs H-mode discharges and the impact of upper and lower triangularity in JET and ASDEX Upgrade, *A Kallenbach et al*, Nuclear Fusion
- Optimisation of pellet scenarios for long pulse fueling to high densities at JET, *P T Lang et al*, Nuclear Fusion
- Fast particle effects on the sawtooth stability of JET DT discharges, *M F Nave*, Nuclear Fusion
- Development of fast helium beam emission spectroscopy for plasma density- and temperature diagnostics, *M Proschek*, Nuclear Fusion
- Application of the RPT transport model to the JET tokamak, *A Schilham et al*, Nuclear Fusion
- The effect of plasma shaping on the damping of low- n Alfvén Eigenmodes in JET tokamak plasmas, *D Testa et al*, Nuclear Fusion
- Spectroscopy of hydrocarbon fluxes in the JET divertor, *M F Stamp*, Physica Scripta
- Observation of Zero Current Density in the Core of JET Discharges with Lower Hybrid Heating and Current Drive, *N C Hawkes et al*, Physical Review Letters
- A dimensionless criterion for characterising internal transport barriers in JET, *G Tresset et al*, Physical Review Letters

- Poloidally asymmetric distribution of impurities in Joint European Torus plasmas, *H Chen*, Physics of Plasmas
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