11th International Symposium on Fusion Nuclear Technology

16-20 September 2013. Barcelona, Spain

Final Programme

Organizers:

IREC
Institut de Recerca en Energia de Catalunya
Catalonia Institute for Energy Research

GOBIERNO DE ESPAÑA
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Ciemat
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas

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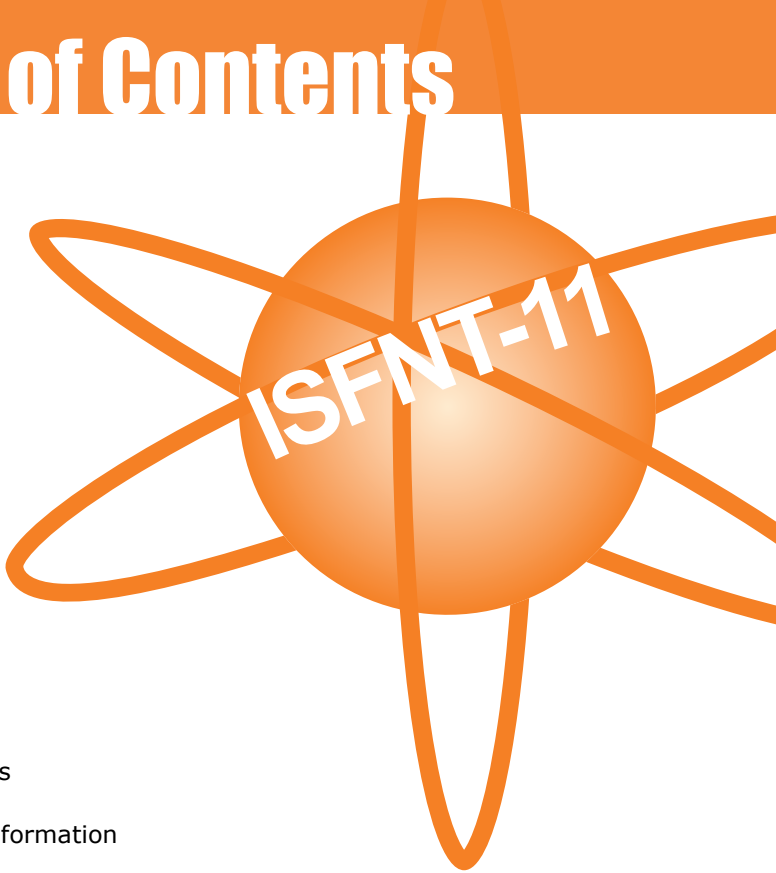

Welcome

Dear colleague,

On behalf of the Local Organizing Committee, it is our pleasure to welcome you to the 11th International Symposium on Fusion Nuclear Technology (ISFNT), held in Barcelona, Spain, from 16-20 September 2013.

The main goal of the ISFNT, which has been recognized as one of the main international gathering for fusion energy, is fostering collaborations among scientists and engineers working on the many technical disciplines of the field and to exploit synergies that have arisen in order to identify means to resolve the key issues in Fusion Nuclear Science and Technology. The symposium focuses on both near-term fusion devices and long-term reactor technologies with special attention to science, engineering, experiments, facilities, modeling, analysis, design and safety.

The ISFNT-11, hosted by Ciemat and IREC, presents a scientific program with more than 450 contributions, including a dedicated Fusion Road Map Panel with recognized international experts worldwide. In addition, ISFNT-11 presents a complete Industrial Program with an Industrial Exhibition, an Industrial Forum focused to the ITER project and a B2B/B2C platform in order to foster communication between academia and industry.

Linked to the ISFNT-11 it will be also held a number of satellite meetings and workshops. Between them it can be mentioned the 17th IEA International Workshop on the Ceramic Breeder Blankets:, the 11th IEA International Workshop on Beryllium Technology or the IEA Liquid Breeders Blankets Subtask Workshop.

The International Symposium on Fusion Nuclear Technology-11 will continue its recognized tradition of excellence and stimulate the interest of its participants.

We wish you a successful ISFNT-11 in Barcelona!

Yours sincerely,

Joaquín Sánchez
Director of National Fusion Laboratory. CIEMAT
General Chairman ISFNT-11

Committees

Symposium Committee

Honorary Chair:	F. Puig, Minister of Enterprise and Labour, Catalonia
General Chair:	J. Sánchez, Director of National Fusion Laboratory (CIEMAT)
General Co-Chair:	H. Bindslev, Director of Fusion for Energy.
Scientific Secretary:	A. Ibarra, Head of Fusion Technology Division (CIEMAT)

Local Organizing Committee

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O. Nomen, I. Martínez (IREC)
D. Dabbah, F. Carbajo, A. García, R. Román, J. Molla (CIEMAT)
G. Prats (ACC10)
G. Domakowski (b_TEC)
A. del Cerro (CDTI)
J. Dies, J. Abal (UPC)
B. Perier (F4E)

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Chair: H. Takatsu. JAEA, Japan

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L. Boccaccini. FZK, Germany
S. Cho. NFRI, Korea
S. Deshpande. IPR, India
G. Federici. EFDA, Germany
K. Feng. SWIP, China
L. Giancarli. ITER, France
T. Hayashi. JAEA, Japan
B. Hong. Chonbuk National University, Korea
A. Ibarra. CIEMAT, Spain
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A. Kohyama. Kyoto University, Japan
E. Rajendra. Kumar IPR, India
J. Li. ASIPP, China
D. Maisonnier. European Commision
I. Mazul. EFREMOV, Russia
K. McCarthy. INL, USA
W. Meier. LLNL, USA
B. J Merrill. INL, USA
N. Morley. UCLA, USA
C. Pan. SWIP, China
Y. Poitevin. F4E, Spain
J. Sánchez. CIEMAT, Spain
Y. Strebkov. NIKIET, Russia
S. Tanaka. Tokyo University, Japan
Y. Wan. USTC China
Y. Wu. ASIPP, China

International Programme Committee

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P. Batistoni, EU
L. Boccaccini, EU
S. Cho, Korea
C. Day, EU
L. Deli, China
S. Desphande, India
E. Diegele, EU
M. Enoeda, Japan
W. Farong, China
G. Federici, EU
K. Feng, China
J. M. Filhol, EU
U. Fischer, EU
L. Giancarli, ITER Organization
A. Hasegawa, Japan
T. Hayashi, Japan
Y.S. Hwang, Korea
G. Janeschitz, ITER Organization
G. Kalinin, Russia
S. Khirwadkar, India
A. Kohyama, Japan
S. Konishi, Japan
R. Kurtz, USA
D. W. Lee, Korea
N. Mingjiu, China
D. Maissonier, EU
P. Magaud, EU
I. Mazul, Russia
W. Meier, USA
M. Merola, ITER Organization
B. Merril, USA
A. B. Mineev, Russia
N. Morley, USA
R. Nygren, USA
K. Okuno, Japan
Y. Poitevin, EU
H. Qunying, China
R. Raffray, ITER Organization
E. Rajendra Kumar, India
S. Reyes, USA
B. Rodchenkov, Russia
A. Sagara, Japan
S. Smolentsev, USA
R. Srinivasan, India
Y. Strebkov, Russia
S. Suzuki, Japan
H. Tanigawa, Japan
N. Taylor, ITER Organization
M. Q. Tran, EU
Y. Ueda, Japan
M. A. Ulrickson, USA
C. Wong, USA
Y. Wu, China
J. Xin, China
T. Yamanishi, Japan
A. Ying, USA

Practical Information

About Barcelona

Barcelona is a dynamic, welcoming city and one of the major economic and business centers of the Mediterranean Europe. The Catalan capital has a modern hotel infrastructure and boasts first rate shops and leisure, cultural and tourist attractions; all these traits have made Barcelona a first classtourist destination, and the ideal place for meetings and congresses.

Barcelona enjoys a Mediterranean climate with mild, sunny winters, warm summers and relatively low rainfall. Temperatures during September are usually mild (20 to 25 degrees Celsius), and are very pleasant in the evening.

Getting around

Barcelona has a complete public transport network including metro, tramway, buses and local trains. Sants Station is a multi modal station (train, bus and metro) not far from the venue. In Sants Station you can go in high speed to Madrid or Seville.

From the airport: An aerobus departs every 5 minutes from the Barcelona airport and stops at Plaça Espanya (the stop is located at 5 minutes from the venue) and Plaça Catalunya (City center).

Taxis

Taxis in Barcelona may be ordered by phone, picked up at authorized taxi stands or flagged down in the street. Taxis must usually be paid in cash though some accept credit cards.

Radio Taxi: +34 933 03 30 33

Taxi for disabled people: +34 935 51 93 68

Commercial opening times

Opening times for banks: In general, banks and savings banks open from 08.30 a.m. to 02.00 p.m. from Monday to Friday. There is an extended cash-point machines all over the city.

Shopping centers are open Monday - Saturday from 10:00 - 22:00.

Useful telephones

For emergencies: 112
Municipal Police: 092
Bus station: +34 934913183
RENFE (Spanish railway): Customer Service + 34 902 320 320

Palau de Congressos de Barcelona

The Conference will be held in the Palau de Congresos de Barcelona in exclusivity:

Avda. Reina Maria Cristina s/n
08004 Barcelona

This venue offers a wide space for commercial, cultural and scientific events with all the necessary technical facilities. Located in downtown Barcelona, it allows easy access to all historical and tourist attractions, hotels and shopping areas.

The venue is easily accessible by subway: stop Espanya (green and red line) is at only 2 minutes walking.

ISFNT counts with:

. 1500 sq.m for industrial exhibition and poster presentations
. Auditorium with a capacity of over 1600 attendees
. Breakout rooms
. Cafeteria

Badge Pick up

Technical Secretariat is in the Hall of the Congress Centre. Bags and accreditations can be picked up on Sunday September 15th 16:00 to 18:00 and on Monday - Friday from 8:00.

Language

The working language of ISFNT is English

Coffee Breaks (morning and afternoon)

There will be a coffee break every morning from 10.30-11.00 and every afternoon from 16.00- 16.30 (except Wednesday and Friday).

Internet Access

There is free wi-fi internet access at the meeting venue. The network name is ISFNT-11.

Cafeteria Opening Times

There is a Cafeteria inside the Palau de Congresos de Barcelona for attendees to purchase sandwiches and drinks. It will be open from 8:30 - 16:00 and is located in level 2.

Nearby restaurants also offer some affordable menus.

Author's Information

Oral presentation's Upload

You can upload your presentation in the speaker's room (room 10, second level).
Acceptable presentation formats are PPT, PPTX and PDF. The presentation must be given in the day before except for Monday presentations, that must be uploaded two hours in advance.

Instructions for Oral Presenters

Talks are scheduled in different time slots.

40 minutes for Keynotes Speakers + 5 min. for Q&A
30 minutes for Plenary Speakers + 5 min. for Q&A
25 minutes for Oral communications + 5 min. for Q&A

Keynotes and Plenary presentations are allocated in room 7 (Auditorium); other oral presentations are allocated in rooms 5 and 6.

Poster Presentations

The poster boards are located on the ground floor and are numbered. Posters are divided in three two-hour sessions, as follows:

* Tuesday 17th 16:00 to 18:00 *(posters for this session can be put up from 10.00)*

* Wednesday 18th 11:00 to 13:00 *(posters for this session can be put up from 08.30)*

* Thursday 19th 16:00 to 18:00 *(posters for this session can be put up from 10.00)*

Each poster presentation will be displayed for the day of the poster schedule. Authors are kindly requested to be available for discussion of their work during the designated poster sessions. Posters should be installed in the morning and removed after the poster session (but no later than 19.00). Left over posters will be thrown away.

Notice board

A notice board is located in the reception desk area for Symposium announcements and for delegates to place messages for each other. Please refer to this notice board for any changes in the programme or arrangements during the symposium.

Satellite meetings

Pre-congress, during and post-congress satellite meetings are arranged.

During the symposium, the satellite meetings are held in rooms 3 and 4. Please refer to the general programme for further information.

Please be aware that most of the satellite meetings are restricted and require invitation.

SOCIAL EVENTS

Welcome Cocktail

All participants are invited to attend the Welcome Cocktail on Monday September 16th at 18.00 at the Symposium venue.

Congress Dinner

The congress dinner will be on Thursday September 19th at 20.00.

Venue: Teatre Nacional de Catalunya (TNC)
Address: Plaça de les Arts, 1

How to get there

Metro
Line 1 (Stops: Glòries and Marina)
Line 2 (Stop: Monumental)

Tram
Line T4 (Stop: L'Auditori /Teatre Nacional)
Line T5 (Stop: Glòries)

Please note that transport to the congress gala dinner site is not provided by the organization.

Industrial Exhibition

Booths are located in the main hall near the entrance. Attendees are encouraged to spend time visiting the booths and interacting with the exhibitors, commercial and nonprofit exhibitors.

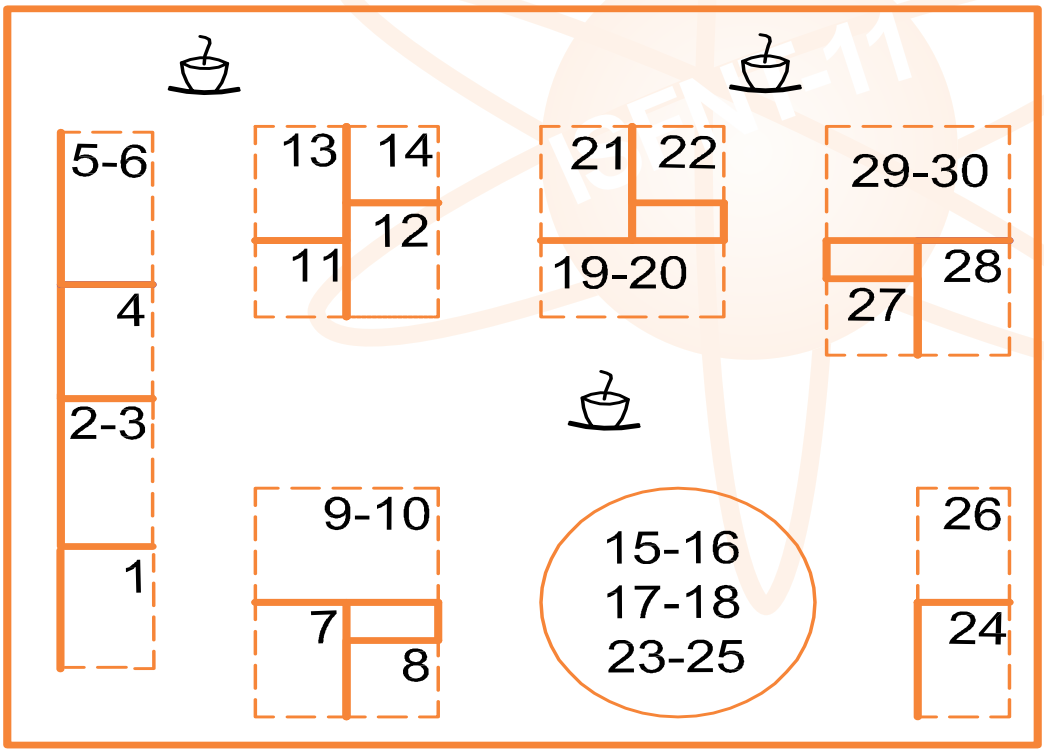
Industrial Exhibition Schedule

Monday, 16th	10.30 to 18.00
Tuesday, 17th	09.00 to 18.00
Wednesday, 18th	09.00 to 18.00
Thursday 19th	09.00 to 18.00
Friday, 20th	09.00 to 13.30

Dismantling: Friday, 20th starting from 13:30

Industrial Exhibition

Exhibition Floor Map



Industrial Exhibition

Exhibitors list

Stand 1:

Stand 2-3:

Stand 4:

Stand 5-6:

Stand 7:

Stand 8:

Stand 9-10:

Stand 11:

Stand 12:

Stand 13:

Stand 14:

Stand 19-20:

Stand 15-16-17-18-23-25:

Stand 21:

Stand 22:

Stand 24:

Stand 26:

Stand 27:

Stand 28:

Stand 29-30:

Industrial Workshop

An Industrial Workshop will be held within the Symposium on Tuesday, September 17th. Please refer to the general programme for detailed information.

Fusion Road Map Panel

Road Map Panel (Tuesday, 17th, 11.00 - 13.00) is thought to be a lively session and attendees are offered the opportunity to submit their questions to the Panel Members in advance. You may submit your question through the website of the Congress, tab Fusion Road Map Panel (detailed programme is available in pages 32-35).

B2B and C2B Meetings

During the ISFNT symposium delegates and companies will hold B2B and C2B meetings in a dedicated space. Pre-registration is required through the B2B platform that is available on the website.

Technical Visits

Two technical visits are offered for participants on Wednesday 18th in the afternoon. Registration is required.

ALBA is a third generation Synchrotron Light Facility located in Cerdanyola del Vallès, near Barcelona. It is constructed and operated by the CELLS consortium and is co-financed by the Catalan and Spanish governments. The storage ring commissioning and the installation of the first seven beamlines are completed.
First users are visiting the laboratory since May 2012.

Schedule of the buses
Visit 15.00 - 17.00. The bus will depart at 14.00 from the Conference Center
Visit 17.00 - 19.00. The bus will depart at 16.00 from the Conference Center

MareNostrum: Barcelona Supercomputing Center

BSC-CNS (Barcelona Supercomputing Center – Centro Nacional de Supercomputación) is the National Supercomputing Facility in Spain and was officially constituted in April 2005. BSC-CNS manages MareNostrum, one of the most powerful supercomputers in Europe, located at the Torre Girona chapel in Barcelona.

The mission of BSC-CNS is to investigate, develop and manage information technology in order to facilitate scientific progress. With this aim, special dedication has been taken to areas such as Computer Sciences, Life Sciences, Earth Sciences and Computational Applications in Science and Engineering.

Schedule of the buses
Visit 15.00 - 17.00. The bus will depart at 14.15 from the Conference Center
Visit 17.00 - 19.00. The bus will depart at 16.15 from the Conference Center

Meeting at a Glance

<table>
<tr><th>Time</th><th>Sunday 15th</th><th colspan="4">Monday 16th</th></tr>
<tr><td>8:00</td><td></td><td colspan="4">Registrations</td></tr>
<tr><td>09:00-10:30</td><td></td><td colspan="4">Opening Session
Dr. Takatsu
Dr. Joaquín Sánchez
Ms. Carmen Vela
Mr. Pere Torres
Dr. H. Bindslev
9:45 - 10:30 I1.1: O. Motojima (ITER)
10:30 - 11:00 Inauguration of the Industrial Exhibition by Authorities</td></tr>
<tr><td>10:30-11:00</td><td></td><td colspan="3">Coffee break</td><td rowspan="9">Industrial Exhibition</td></tr>
<tr><td>11:00-13:00</td><td></td><td colspan="3">Plenary Session 1
1I1.2 F. Romanelli
I1.3 H. Horiike
I1.4 G. Lee</td></tr>
<tr><td>13:00-14:30</td><td></td><td colspan="3">Lunch break</td></tr>
<tr><td>14:30-16:00</td><td></td><td>Parallel M1
Topic B: Blankets-Special TBMs
O1A.1 Y. Poitevin
O1A.2 S. Cho
O1A.3 R. Bhatacharyay</td><td>Parallel M2
Topic D: Materials
O1B.1 S. Zinkle
O1B.2 B. Wirth
O1B.3 A.Hasegawa</td><td>Parallel M3
Topic E: Exvessel
O1C.1 A. Dans
O1C.2 P. Bruzzone
O1C.3 A.Bhardwaj</td></tr>
<tr><td>16:00-16:30</td><td rowspan="2">Registration Opens</td><td colspan="3">Coffee break</td></tr>
<tr><td>16:30-18:00</td><td>Parallel M4
Topic B: Blankets - Special TBMs
O2A.1 K.M. Feng
O2A.2 S. Smolentsev
O2A.3 M. Enoeda</td><td>Parallel M5
Topic D: Materials
O2B.1 H. Tanigawa
O2B.2 V. Chernov
O2B.3 H. Hirose</td><td>Parallel M6
Topic G: Safety Issues
O2C.1 N. Taylor
O2C.2 J. Paméla
O2C.3 B. Merrill</td></tr>
<tr><td>18:00-20:00</td><td></td><td colspan="3">Welcome Cocktail</td></tr>
<tr><td>20:00-23:00</td><td>Free External Event of Cultural Interest: The Magic Fountain Illuminations in Montjuïc. Located next to the venue. Passes at 21:00, 21:30, 22:00, 22:30 and 23:00.</td><td colspan="3"></td></tr>
</table>

Meeting at a Glance

Time	Tuesday 17th			
8:00	Registrations			
08:30-10:30	**Parallel T1** **Topic B: Blankets** O3A.1 M. Abdou O3A.2 A. Li-Puma O3A.3 P. Calderoni O3A.4 E. Mas De Les Valls	**Parallel T2** **Topic F: Neutronics** O3B.1 M. Loughlin O3B.2 K. Tobita O3B.3 U. Fischer O3B.4 S. Yu	**Parallel T3** **Topic G: Safety Issues** O3C.1 Y. Hatano O3C.2 K. Okano O3C.3 B. Kolbasov O3C.4 Y. Ikeda	Industrial Exhibition
10:30-11:00	Coffee break			
11:00-13:00	Road Map Panel			
13:00-14:30	Lunch break			
14:30-16:00	**Parallel T4** **Topic B: Blankets** O4A.1 A. Ying O4A.2 L. Bühler O4A.3 J. Van Lew	**Parallel T5** **Topic D: Materials** O4B.1 A. Moeslang O4B.2 C. Chang-An O4B.3 R. Vila	Industrial Worshop	
16:00-16:30	Coffee Break			
16:30-18:00	Posters P1			

Meeting at a Glance

Time	Wednesday 18th			
8:00	Registrations			
08:30-10:30	**Parallel W1** **Topic A: First Wall** O5A.1 S. Khirwadkar O5A.2 Y. Ueda O5A.3 M-J. Ni O5A.4 H. Groeneveld	**Parallel W2** **Topic F: Neutronics** O5B.1 D.B Syme O5B.2 J. Song O5B.3 M.Sawan O5B.4 F. Damian	**Parallel W3** **Topic K: Inertial Confinement** O5C.1 W. Meier O5C.2 M. Perlado O5C.3 S. Reyes O5C.4 B. Lee	Industrial Exhibition
10:30-11:00	Coffee break			
11:00-13:00	Poster P2			
13:00-14:30	Lunch break			
14:30-16:00	Technical Visits			
16:00-16:30				
16:30-18:00				

Meeting at a Glance

Time	Thursday 19th			
8:00	**Registrations**			
08:30-10:30	**Plenary Session 2** I2.1 Y. Wu I2.2 B. Kuteev I2.3 A. Garofalo			Industrial Exhibition
10:30-11:00	**Coffee break**			
11:00-13:00	**Parallel Th1** **Topic A: First Wall** O6A.1 R. Raffray O6A.2 S. Suzuki O6A.3 A. Gervash O6A.4 J. Bucalossi	**Parallel Th2** **Topic H: FNT- Special Neutron sources** O6B.1 J. Knaster O6B.2 R. Heidinger O6B.3 E. Surrey O6B.4 M. Pillon	**Parallel Th3** **Topic I: Repair & Maintenance** O6C.1 C. Damiani O6C.2 M. Siuko O6C.3 S. Kakudate O6C.4 A. Loving	
13:00-14:30	**Lunch break**			
14:30-16:00	**Parallel Th4** **Topic A: First Wall** O7A.1 J. Aktaa O7A.2 G-N. Luo O7A.3 P. Norajitra	**Parallel Th5** **Topic D: Materials** O7B.1 D. Stork O7B.2 T. Jayakumar O7B.3 A. Kohyama	**Parallel Th6** **Topic I: Repair & Maintenance** O7C.1 F. Penzel O7C.2 H. Wu O7C.3 A. Martin	
16:00-16:30	**Coffee Break**			
16:30-18:00	**Poster P3**			
18:00-20:00				
20:00-23:00	**Gala Dinner**			

Meeting at a Glance

Time	Friday 20th			
8:00	Registrations			
08:30-10:30	**Parallel F1** **Topic H: FNT** O8A.1 M. Gasparotto O8A.2 A. Sagara O8A.3 S. Konishi O8A.4 E. di Pietro	**Parallel F2** **Topic C: Fuel Cycle** O8B.1 C. Wong O8B.2 K. Ochiai O8B.3 T. Giegerich O8B.4 I. Ricapito	**Parallel F3** **Topic J: Plasma & L: Fission-Fusion** O8C.1 A. Kellman O8C.2 A. Fukuyama O8C.3 M. Cavinato O8C.4 Wang	Industrial Exhibition
10:30-11:00	**Coffee break**			
11:00-13:00	**Plenary Session 3** I3.1 G.Federici I3.2 M. Merola I3.3 P. Batistoni			
13:00-13:30	**Closing Session**			

Programme

MONDAY 16th SEPTEMBER

09:45 – 10:30 **Opening Ceremony**
Auditorium

Chairs: Takatsu, H. and Sánchez, J.

- Takatsu, H. ISC Representative
- Sánchez, J. Chairman of ISFNT-11
- Torres, P. Secretary of Enterprise and Competitiveness, Generalitat de Catalunya
- Bindslev, H. F4E Director

09:45 – 10:30 **I1.1 ITER Project Status Report**
Motojima, O.

10:30 – 11:00 **Inauguration of the ISFNT-11 Industrial Exhibition by Authorities**
Opening Ceremony Authorities and Mr. Dirk Kremer, Vice-Consul of Netherlands in Barcelona.
Visit to the Industrial Exhibition

10:30 – 11:00 **Coffee Break**

11:00 – 13:00 **PLENARY SESSION1**
Auditorium

Chairs: Motojima, O. and Abdou, M.

I1.2 **A Road Map to the realization of Fusion Energy**
Romanelli, F.

I.1.3 **Overview of Activities and Strategy in Japan on Fusion Technology for DEMO**
Horiike, H; Hashizume, H.; Konishi, S.; Nishitani,T.; Okano, K.; Ogawa, Y.; Shimizu, K.; Mori, S. and Tobita, K.

I.1.4 **K-DEMO Design, R&D Plan, and International Collaboration**
Lee, G. S.; Keeman K; Hwang,Y. S.; Han, J. H.; Kim, H.C.; Im, K. H.; Neilson, G. H.; Brown, T.; Titus, P.; and Kessel, C.

14:30 – 16:00 **PARALLEL M1 (Topic B: Blanket Technology) Auditorium**

Chairs: Boccacini, L. and Smolentsev, S.

O1A.1 **The European Test Blanket Module Systems: Status of design, technologies development and integration in ITER**
Poitevin, Y.; Ricapito, I.; Zmitko, M.; Panayotov, D.; Calderoni, P.; Galabert, J.; Vallory, J.; Giancarli, L.; Tavassoli F.; Thomas, N.; De Dinechin, G.; Bucci, Ph.; Aiello A.; Rey, J.; Rueda, F.; Ibarra, A.

O1A.2 **Design and R&D Progress of Korean HCCR TBM**
Cho, S.; Ahn, M. Y.; Lee, D. W.; Lee, C. W.; Park, Y.H.; Lee, E. H.; Jin, H. G.; Kim, T. K.; Kim, S. K.; Yoon, J. S.; Yun, Y. H.; Shin, K. I.; Jung, Y. I.; Jeong, Y. H.; Lee, Y. O.; Ku, D. Y.; Park, S. C.; Kim, C. S.; Jung, K.

O1A.3 **Status of Indian LLCB TBM program and R&D activities Bhattacharyay, R. and Indian TBM Team**

14:30 – 16:00 **PARALLEL M2 (Topic D: Material Engineering for FNT) Room 6**

Chairs: Moeslang, A. and Jayakumar, T.

O1B.1 **Fusion Materials Science and Technology Research Opportunities now and during the ITER Era**
Zinkle,S.J; Blanchard, J.P; Callis, R.W.; Kessel, C.E.; Kurtz, R.J.; Lee P.J.; McCarthy K.A.; Morley, N.B.; Najmabadi, F.; Nygren, R.E.; Tynan, G.R.; Whyte, D.G.; Willms, R.S.; Wirth, B.D.

O1B.2 **Modeling Plasma Surface Interactions in Tungsten through High-Performance Computing**
Wirth, B. D.

O1B.3 **Neutron Irradiation Effects on Tungsten Materials.**
Hasegawa, A.

14:30 – 16:00 **PARALLEL M3 (Topic E: Vacuum Vessel) Room 5**

Chairs: Filhol, J. M. and Gervash, A.

O1C.1 **Challenging issues in the design and manufacturing of the European sectors of the ITER Vacuum Vessel**
Dans, A.; Jucker, P.; Bayon, A.; Arbogast, J-F.; Caixas J.; Fernández, J.; Micó, G.; Pacheco, J.; Trentea, A.; Stamos, V.

O1C.2 **Pre-conceptual studies and R&D for DEMO Superconducting Magnets**
Bruzzone, P. L.

O1C.3 **Challenging Issues in the Manufacturing of the ITER cryostat**
Bhardwaj, A. K.

16:00 – 16:30 **Coffee Break**

16:30 – 18:00 **PARALLEL M4 (Topic B: Blanket Technology) Auditorium**

Chairs: Ying, A. and LiPuma, A.

O2A.1 **New Progress on Design and R&D for Solid Breeder Test Blanket Module in China**
Feng, K.; Zhang, G.; Li, Z.; Zhao, Z.; Feng, Y.; Hu, G.; Ye, X.; Zhang, L.; Chen, Y.; Wang, P.

O2A.2 **DCLL blanket: Status and critical R&D needs**
Smolentsev, S.; Morley, N. B.; Abdou, M.; Malang, S.

O2A.3 **R&D status on Water Cooled Ceramic Breeder Blanket Technology**
Enoeda, M.; Tanigawa, H.; Hirose, T.; Sato, S.; Ochiai, K.; Konno, C.; Kawamura, Y.; Yamanishi, T.; Hoshino, T.; Nakamichi, M.; Tanigawa, H.; Nishi, H.; Suzuki, S.; Ezato, K.; Seki, Y.; Tsuru, D.

16:30 – 18:00 **PARALLEL M5 (Topic D: Material Engineering for FNT) Room 6**

Chairs: Kohyama, A. and Vila, R.

O2B.1 **Limits and Potential of Reduced Activation Ferritic/Martensitic Steels**
Tanigawa, H.; Sakasegawa, H.; Hirose, T.; Someya, Y.; Ochiai, K.

O2B.2 **Low Activation Alloy V-4Ti-4Cr for Fusion and Fission Power Reactors - the RF Results**
Chernov, V.; Potapenko, M.; Drobyshev, V.; Blokhin, D.; Budylkin, N.; Mironova, E.; Blokhin, A.; Loginov, N.; Tyumentsev, A.

O2B.3 **Physical properties of F82H for fusion blanket design**
Hirose, T.; Nozawa, T.; Stoller, R.E.; Sakasegawa, H.; Tanigawa, H.; Tanigawa, H.; Enoeda, M.; Katoh, Y.; Snead, L.L.

16:30 – 18:00 **PARALLEL M6 (Topic G: Safety Issues and Waste Management)**
Room 5

Chairs: Batistoni, P. and Hong, B.

O2C.1 **Lessons learnt from ITER safety & licensing for DEMO and future nuclear fusion facilities**
Taylor, N.; Cortes, P.

O2C.2 **ITER tritiated waste management by the Host state**
Pamela, J.; Canas, D.

O2C.3 **Safety Issues for liquid metal blankets for ITER, FNSF and DEMO and associated R&D needs**
Merrill, B. J.; Wong, C. P. C.2; Cadwallader, L. C.; Abdou, M.; Morley, N. B.

TUESDAY 17th SEPTEMBER

08:30 – 10:30 **PARALLEL T1 (Topic B: Blanket Technology)**
Auditorium

Chairs: Poitevin, Y. and Cho, S.

O3A.1 **Blanket/First Wall Challenges and Required R&D on the pathway to DEMO**
Abdou, M.; Morley, N.; Ying, A.; Smolentsev, S.

O3A.2 **Design and Development of DEMO Blanket Concepts in Europe**
Li-Puma, A.; Boccaccini, L.V.; Bachmann, C.; Noriajitra, P., Sardain, P.

O3A.3 **Options and methods for instrumentation of Test Blanket Module Systems for experiment control and scientific mission**
Calderoni, P.; Ricapito, I.; Zmitko, M.; Leichtle, D.; Poitevin, Y.

O3A.4 **Tritium permeation analysis in liquid metal flows with helium bubbles as applied to liquid metal breeding blankets**
Mas De Les Valls, E.; Batet, L.; Sedano, L. A.

08:30 – 10:30 **PARALLEL T2 (Topic F: Nuclear System Design)**
Room 6

Chairs: Stork, D. and Zeng, Q.

O3B.1 **Status and Verification Strategy for ITER neutronics**
Loughlin, M.; Polunovskiy, E.; Pampin, R.; Batistoni, P.; Konno, C.; Angelone, M.; Bertalot, L.

O3B.2 **Research and Development Status on Fusion DEMO Reactor Design under BA**
Tobita, K., Federici, G., Okano, K., the BA DEMO Design Team

O3B.3 **Neutronic Analyses and Tools Development Efforts in the European DEMO Programme**
Fischer, U.; Bachmann, C.; Catalan, J.; Lengar, I.; Szieberth, M.; Pampin, R.; Porton, M.; Pereslavtsev, P.; Ogando, F.; Tracz, G.; Villari, R.

O3B.4 **An Advanced Interface Program for Multiple Neutronics and Radiation Transport Simulation Codes**
Yu, S.; Wang, G.; Long, P.; Wang, D.; Nie, F.; Wang, D.; Gan, Q.; Zeng, Q.; Hu, L.; Wu, Y.

08:30 – 10:30 **PARALLEL T3 (Topic G: Safety Issues and Waste Management)**
Room 5

Chairs: Taylor, N. and Dies, J.

O3C.1 **Tritium safety in maintenance and waste handling in fusion reactors**
Hatano, Y.

O3C.2 **DEMO Design Activities (DDA) in the Broader Approach (BA) under Japan/EU collaboration**
Okano, K.; Federici, G.; Tobita, K.

O3C.3 **Some technological problems of fusion materials management**
Kolbasov, B.; Di Pace, L.; El-Guebaly, L.; Han, J. H; Khripunov, V.; Massaut, V.; Someya, Y.; Tobita, K.; Zucchetti, M.

O3C.4 **Safe Disassembly and Storage of Radioactive Components of JT-60U Torus/ Disassembly of JT-60 for JT-60SA**
Ikeda, Y.; Okano, F.; Hanada, M.; Sakasai, A.; Kubo, H.; Akino, N.; Chiba, S.; Ichige, H.; Kaminaga, A.; Kiyono, K.; Miyo, Y.; Nishiyama, T.; Sasajima, T.; Yagyu, J.; Yokokura, K. and JT-60 Team

10:30 – 11:00 **Coffee Break**

11:00 – 13:00 **Fusion Road Map Panel**
Auditorium

Chair: Abdou, M.

14:30 – 16:00 **PARALLEL T4 (Topic B: Blanket Technology)**
Auditorium

Chairs: Federici, G. and Feng, K.

O4A.1 **Virtual Plasma Chamber Integrated Multi-Physics Simulation: Status and Next Steps**
Ying, A.; Youchison, D.; Wu, Y.; Ulrickson, M.; Turner, J.

O4A.2 **Facilities, testing program and modeling needs for studying liquid metal magneto hydrodynamic flows in fusion blankets**
Bühler, L.; Mistrangelo, C.; Konys, J.; Bhattacharyay, R.; Huang, Q.; Obukhov D.,; Smolentsev, S.; Utili, M.

O4A.3 **Discrete element method simulations to determine the thermal impact of pebble failures as it relates to solid breeder designs**
Van Lew, J.; Ying, A.; Abdou, M.

14:30 – 16:00 **PARALLEL T5 (Topic D: Material Engineering for FNT)**
Room 6

Chairs: Bhatacharyay, R. and Morley, N.

O4B.1 **Materials R&D and materials technology for DEMO – Current level of technical readiness of candidate materials, uncertainties and strategies to close holes in knowledge**
Moeslang, A.

O4B.2 **Overview of Development on Tritium Permeation Barriers in CAEP**
Chen, C. A.; Zhang, G.; Wang, X.; Li, J.; Lai, X.

O4B.3 **Radiation Hardness Testing of Functional Materials for Future Fusion Reactors.**
Vila, R; González, S.

16:00 – 16:30 **Coffee Break**

16:00 – 18:00 **Poster Session P1**
Ground Floor

Chairs: Enoeda, M. and Moreno, C.

WEDNESDAY 18th SEPTEMBER

08:30 – 10:30 **PARALLEL W1 (Topic A: First-Wall Technology and High Heat Flux Components) Auditorium**

Chairs: Magaud, P. and Suzuki, S.

O5A.1 **Status of Divertor technologies and test facilities developments at IPR**
Khirwadkar, S.S.

O5A.2 **Research status and issues of tungsten plasma facing materials for ITER and beyond**
Ueda, Y.; Coenen, J. W.; De Temmerman, G.; Doerner, R. P.; Linke, J.; Philipps, V.; Tsitrone, E.

O5A.3 **Modeling of MHD Issues Relevant to Liquid Lithium First Wall in China**
Ni, M. J.; Zhang, J.; Wang, J. J.; Hu, J. S.; Li, J. G.

O5A.4 **Developments with explosive forming for complex sheetmetal components and with explosive bonding as a joining technique for dissimilar materials for ITER**
Dobrushin, L.; Groeneveld, H.; Huber, Th.; Illarionov, S.; Pavei, M.; Richou, M.

08:30 – 10:30 **PARALLEL W2 (Topic F: Nuclear System Design) Room 6**

Chairs: Fischer, U. and Heidinger, R.

O5B.1 **Fusion Yield measurements on JET and their Calibration**
Syme, D. B.; Popovichev, S.; Conroy, S.; Lengar,I.; Snoj, L.; Sowden, C.; Giacomelli, L.; Hermon, G.; Allan, P.; Macheta, P; Plummer, D; Stevens, J.; Prokopowicz, R.; Jednorog, S.; Abhangi, M. R.; Makwana, R. JET EFDA Contributors

O5B.2 **Development of Super Monte Carlo Simulation Program for Fusion and Fission Applications**
Song, J; Sun, G.; Zheng, H.; Chen, Z.; Wu, M.; Hao, L.; Li, G.; Chen, C.; Zhang, K.; He, T.; Yu, S.; Zeng, Q; Long, P.; Hu, L.; Wu, Y.; FDS Team

O5B.3 **Automatic Mesh Adaptivity for Hybrid Monte Carlo/Deterministic Neutronics Modeling of Fusion Energy Systems**
Ibrahim, A.; Wilson, P; Sawan, M.; Mosher, S.; Peplow, D.; Evans, T.; Grove, R.

O5B.4 **TRIPOLI-4 version 9 Shielding for the fusion community: overview, relevant benchmarking for fusion and licencing policy**
Trama, J. C.; Brun, E.; Damian, F.; Diop, C.; Dumonteil, E.; Hugot, F. X.; Jouanne, C.; Lee, Y. K.; Malvagi, F.; Mazzolo, A.; Petit, O.; Visonneau, T.; Zoia, A.

08:30 – 10:30 **PARALLEL W3 (Topic K: Inertial Confinement) Room 5**

Chairs: Merrill, B. and Fukuyama, A.

O5C.1 **Fusion Technology Aspects of Laser Inertial Fusion Energy (LIFE)**
Meier, W.R.; Dunne, A.M.; Kramer, K.J.; Reyes, S. and the LIFE Team

O5C.2 **Physics and Technology for Engineering and Power Plant in Laser Fusion Energy Systems under Repetitive Operation**
Perlado, J. M.

O5C.3 **Closing the fusion fuel cycle: LIFE tritium recovery and processing**
Reyes, S.; Anklam, T.; Becnel, J.; Dunne, M.; Farmer, J; Bandhauer, T.; Kramer, K.; Martinez-Frias, J.; Miles, R.; Taylor, C. Shanahan, K.

O5C.4 **Development of fusion-fission hybrid reactor utilizing high power/rep-rate lasers**
Lee, B.; Kong, H. J.; Lee, Jae Y.; Park, Young C.; Kim, Y. G.

10:30 – 11:00 **Coffee Break**

11:00 – 13:00 **Poster Session P2 Ground Floor**

Chairs: Kuteev, B.V and García, A.

THURSDAY 19th SEPTEMBER

08:30 – 10:30 **PLENARY SESSION 2**
Auditorium

Chairs: Gasparoto, M. and Sagara, A.

I2.1 **China's Plan for Design and R&D Activities of Multi-Functional Fusion Test Reactor**
Wu,Y., FDS Team

I2.2 **Development of MW-range fusion neutron sources on the roadmap to DEMO**
Kuteev, B.V.

I2.3 A **Fusion Nuclear Science Facility for a Fast-Track Path to DEMO***
Garofalo, A.M.; Abdou, M.; Canik, J.M.; Chan, V.S.; Morley, N.B.; Sawan, M.E.; Taylor, T.S.; Wong, C.P.C. and Ying, A.

10:30 – 11.00 **Coffee Break**

11:00 – 13:00 **PARALLEL TH1 (Topic A: First-Wall Technology and High Heat Flux Components)**
Auditorium

Chairs: Khirwadkar, S. and Aktaa, J.

O6A.1 **Design, Fabrication and Testing of the ITER FW and Shielding Blanket**
Raffray, R.; Calcagno, B.; Chappuis, P.; Dellopoulos, G.; Eaton, R.; Fu, Zhang; Gervash, A.; Chen, Jiming; Kim, D. H.; Kim S. W.; Khomiakov, S.; Labusov, A.; Martin, A.; Merola, M.; Mitteau, R. ; Ulrickson, M.; Zacchia,F. and all contributors to the BIPT* effort

O6A.2 **R&D and procurement status on ITER divertor components in JAEA**
Suzuki, S.; Ezato, K.; Seki, Y.; Yokoyama, K.; Mohri, K.; Kakudate, S.

O6A.3 **Qualification of ITER EHF First Wall in Russia**
Gervash, A.; Eaton, R.; Glazunov, D.; Kuznetsov, V.; Mazul, I.; Mirgorodsky, V.; Mitteau, R.; Raffray, R.; Rulev, R.; Semichev, D.

O6A.4 **The WEST project: testing ITER divertor high heat flux component technology in a steady state tokamak environment**
Bucalossi, J.; Doceul, L.; Firdaouss, M.; Gargiulo, L.; Garin, P.; Grosman, A.; Lipa, M.; Missirlian, M.; Mollard, P.; Nardon, E.; Richou, M.; Sabot, R.; Salasca, S.; Samaille, F.; Tsitrone, E.; Van Houtte, D.

11:00 – 13:00 **PARALLEL TH2 (Topic H: Models and Experiment for FNT) Room 6**

Chairs: Lee, G.S. and Okano, K.

O6B.1 **IFMIF, a fusion relevant neutron source for material irradiation: current status**
Knaster, J.; Chel, S.; Fischer, U.; Groeschel, F.; Heidinger, R.; Ibarra, A.; Micciche, G.; Möslang, A.; Sugimoto, M.; Wakai, E.

O6B.2 **Technical analysis of an early fusion neutron source based on the enhancement of the IFMIF/EVEDA accelerator prototype**
Heidinger, R.; Ibarra, A., Barabaschi, P.; Cara, P.; Mosnier, A.; Mota, F.; Nitti, Francesco, S.

O6B.3 **FAFNIR: strategy and risk reduction in accelerator driven neutron sources for fusion data**
Surrey, E.; Porton, M. and FAFNIR collaboration members

O6B.4 **Feasibility Study of an Intense D-T Fusion Source. "The New Sorgentina"**
Pietropaolo, A.; Angelone, M.; Pillon, M.; Pizzuto, A.

11:00 – 13:00 **PARALLEL TH3 (Topic I: Repair & Maintenance) Room 5**

Chairs: Toshihiko, Y. and Maissonier, D.

O6C.1 **The European contribution to ITER Remote Maintenance**
Damiani, C.; Annino, C.; Bertora, F.; Ceccanti, F.; Di Mascio, T.; Dubus, G.; Esqué, S.; González, C.; Lewczanin, M; Locke, D.; Olajos, K; Ranz, R.; Shuff, R.; Puiu, A.; Van Hille, C.; Van Uffelen, M.; Chang-Hwan, C.; Palmer, Jim; Hamilton, D; Friconneau, J. P., Tesini, A.

O6C.2 **Verifying and validating ITER divertor Remote Handling on Divertor Test Platform**
Siuko, M.; Järvenpää, J.; Mäkinen, H.; Määttä, T.; Saarinen, H.; Esque, S.; Palmer, J.

O6C.3 **R&D status on Remote Maintenance Technology in JAEA**
Ueno, K.; Takeda, N.; Aburadani, A.; Maruyama, T.; Kakudate, S.

O6C.4 **Pre-conceptual Design Assessment of DEMO Remote Maintenance**
Loving, A.; Crofts, O.; Harmon, J.; Fischer, U.; Sanz, J.; Siuko, M.; Mittwollen, M. et.al.

14:30 – 16:00 **PARALLEL TH4 (Topic A: First-Wall Technology and High Heat Flux Components) Auditorium**

Chairs: Raffray, R. and Tran, M. Q.

O7A.1 **Manufacturing and joining technologies for helium cooled divertors**
Aktaa, J.; Basuki, W.; Weber, T.; Norajitra, P.; Krauss, W.; Konys, J.

O7A.2 **Current status of W/Cu divertor for EAST and related R & D for actively cooled HHF components**
Luo, G.N.; Yao, D.M; Li, G.

O7A.3 **Status and prospects of the EU development of the He-cooled divertor for DEMO power plant**
Norajitra, P.; Basuki, W.; Giniyatulin, R.; Koncar, B.; Mazul, I.; Richou, M.; Spatafora, L.

14:30 – 16:00 **PARALLEL TH5 (Topic D: Material Engineering for FNT) Room 6**

Chairs: Zinkle, S. and Tanigawa, H.

O7B.1 **Materials R&D for a timely DEMO: key Findings and Recommendations of the EU Roadmap Materials Assessment Group**
Stork, D. and the EU Roadmap Materials Assessment Group

O7B.2 **Current Status of the Technology Development for Fabrication of Indian Test Blanket Module (TBM) of ITER**
Jayakumar, T.; Ellappan, R. K.
O7B.3 **The Progresses in SiC/SiC Component Development Fusion/Fission Application**
Kohyama, A.; Kishimoto, H.

14:30 – 16:00 **PARALLEL TH6 (Topic I: Repair & Maintenance)**
Room 5

Chairs: Damiani, C. and Micciche, G.

O7C.1 **Automated in situ line of sight calibration of ASDEX Upgrade bolometers**
Penzel, F.; Meister, H.; Bernert, M.; Kannamüller, M.; Koll, J.; Trautmann, T.; Koch, A. W.

O7C.2 **Mobile robot for the inspecting in vacuum vessel of ITER**
Wu, H.

O7C.3 **In-Vessel Components Water Cooling Pipes: Design, Installation and Maintenance Strategy**
Martín, A.; Dell Orco, G.; Escourbiac, F.; Furmanek, A.; Gicquel, S.; Jokinen, T.; Macklin, B.; Merola, M.; Palmer, J.; Raffray, R.

16:00 – 16:30 **Coffee Break**

16:00 – 18:00 **Poster Session P3**
Ground Floor

Chairs: Konishi, S. and Sanmartí, M.

FRIDAY 20th SEPTEMBER

08:30 – 10:30 **PARALLEL F1 (Topic H: Models and Experiment for FNT)**
Auditorium

Chairs: Luo, G.N. and Knaster, J.

O8A.1 **Wendelstein 7-X: Status of Project Construction and Commissioning Planning**
Gasparotto, M.; Baylard, C.; Boscary, J.; Bosch, H. S.; Brakel, R.; Hartmann, D.; Grote, H.; Klinger, T.; Lorenz, A.; Nagel, M.; Naujoks, D.; Peacock, A.; Rummel, T.; Schauer, F.; Stadler, R.; Vilbrandt, R.; Wegener, L.

O8A.2 **Helical Reactor Design FFHR-d1 and c1 for Steady State DEMO**
Sagara, A.; Miyazawa, J.; Goto, T.; Tamura, H.; Tanaka, T.; Yanagi, Y. and FFHR Design Group

O8A.3 **Biomass-Fusion Hybrid and Energy Application for Future Energy Strategy**
Konishi, S.; Kasada, R.

O8A.4 **Overview of engineering design, manufacturing and assembly of JT-60SA machine**
Di Pietro, E.; Barabaschi, P.; Kamada, Y.; Ishida, S.

08:30 – 10:30 **PARALLEL F2 (Topic C: Fuel Cycle and Tritium Processing) Room 6**

Chairs: Reyes, S. and Day, C.

O8B.1 **Estimate of Initial Tritium Inventory for the Fusion Nuclear Science Facility**
Wong, C.; Merrill, B.

O8B.2 **DT neutron irradiation experiment for tritium recovery on WCCB blanket**
Ochiai, K.; Kawamura, Y.; Hoshino, T.; Edao, Y.; Takakura, K.; Ohta, M.; Sato, S.; Konno, C.

O8B.3 **The KALPUTREX-Process -A new vacuum pumping process for exhaust gases in fusion power plants**
Giegerich, T.; Day, C.

O8B.4 **Technologies and Modelling Issues for Tritium Processing in the European Tests Blanket Systems and Perspectives for DEMO**
Ricapito, I.; Calderoni, P.; Poitevin, Y.; Aieloo, A.

08:30 – 10:30 **PARALLEL F3 (Topic J: Burning Plasma Control and Operation & Topic L: Fission-Fusion Synergy and Cross-Cutting Technologies) Room 5**

Chairs: Perlado, J. M. and Garofalo, A.

O8C.1 **Advanced Tokamak Regime. What technology is needed and what role is D-III research playing**
Kellman, A.

O8C.2 **Progress of integrated modeling for burning plasma control and operation**
Fukuyama, A.

O8C.3 **Preparation for the operation of ITER: EU study of the pulse control system**
Cavinato, M.; Ambrosino, R.; Gribov, Y.; Mattei, M.; Pironti, A.; Saibene, G.; Sartori, R.; Zabeo, L.

O8C.4 **Conceptual Design of a Fusion-Fission Hybrid Reactor for Spent Fuel Burning (FDS-SFB)**
Wang, M.; Jiang, J.; Jin, M.; Lv, Z.; Zeng, Q.; Wu, Y.

10:30 – 11:00 **Coffee Break**

11:00 – 13:00 **PLENARY SESSION 3**
Auditorium

Chairs: Ibarra, A. and Wu, Y.

I3.1 **Overview of EU demo design activities**
Federici, G.; Romanelli, F. the PPPT Team et al.

I3.2 **Overview and status of ITER Internal Components**
Merola, M.; Escourbiac, F.; Raffray, R.

I3.3 **The JET technology program in support of ITER**
Batistoni, P.; Likonen, J.; Bekris, N.; Brezinsek, S.; Horton, L.; Matthews, G.; Rube, M.l; Sips, G.; Syme, B.; Widdowson, A. and EFDA-JET Contributors

13:00 – 13:30 **Closing Session**
Auditorium

Fusion Road Map Panel

11:00 –13:00
Tuesday, 17 September 2013

Auditorium

Moderated by
Mohamed Abdou

Panel Members:
Gianfranco Federici, Yuanxi Wan, Gyung-Su Lee, Roberto Adinolfi, Pietro Barabaschi, Neil B. Morley, Kunihiko Okano, Boris Kuteev

Objectives of the Panel:
- Define the 5-10 dominant key questions that a credible roadmap to DEMO must address.
- Elaborate on the challenges embodied in these dominant key questions and suggested approaches to confronting them.

Panel Members:
Eight leaders from the major world fusion programs who have experience in fusion and technology R&D, fusion roadmapping, and FNT

Format:
- Panel session duration: 2 hours
- Introduction by Moderator, Prof. Mohamed Abdou
- Prepared remarks by panel members (50 minutes)
- Audience Q&A (70 minutes)

Fusion Road Map Panel

Mohamed Abdou (Panel Moderator) is a Distinguished Professor of Engineering and Applied Science at Univ. of California, Los Angeles (UCLA). He is also the Director of both the Energy and Fusion Centers at UCLA. He is the Founding President of The US Council of Energy Research and Education Leaders (CEREL). He pioneered many research areas of Fusion Nuclear Science and Technology (FNST).
He has published >350 scholarly journal papers on experiment, modeling, and analysis for neutronics, tritium transport, MHD thermofluids, thermomechanics and materials; as well as on creative designs of fusion nuclear components and power plants. He led many US and international studies on fusion issues and innovative solutions as well as on technical planning and development pathways. Prof. Abdou won many honors and recognition for his pioneering technical contributions and leadership.

Panel Members

Gianfranco Federici, current head of EFDA's Power Plant Physics and Technology Department, is responsible for the coordination of EU Design and R&D efforts aimed at the conceptual design of a DEMOnstration Power Reactor. He has more than 20 years of professional experience in fusion engineering and design, mainly in divertor design, plasma surface interactions, and breeding blanket design. In addition to his over 100 publications, he is a Fellow of the American Nuclear Society, and has contributed over the years to the NET Team, ITER EDA Team, and Fusion for Energy (F4E).

Yuanxi Wan graduated from Beijing University and has since been working at the Institute of Plasma Physics, at the Chinese Academy of Science, serving many years as director in charge of the EAST superconducting tokamak project design, construction, and experiments. He is also currently USTC Dean of Nuclear Science and Technology. For several years he was Vice- Chair/Chair of ITER's STAC. In 2009, he was elected as an academician to the prestigious Chinese Academy of Engineering. He is leading the national integration reactor design group for the design of Chinese Fusion Engineering Test Reactor (CFETR).

Fusion Road Map Panel

Gyung-Su Lee received his doctorate in Plasma Physics and Fusion from the University of Texas at Austin, USA. Over the past fifteen years he has been very active in the fusion engineering and technology community, directing the KSTAR project from 1996-2006, as well as serving as the Director General of ITER Korea and the President of Korea's National Fusion Research Institute (NFRI). He is currently the Chairman of the IAEA International Fusion Research Council, as well as a member of the ITER Council.

Roberto Adinolfi received his degree in Nuclear Engineering cum laude at Milan Polytechnic in 1976. He immediately joined ANSALDO, designing nuclear power plants in Italy and abroad, applying his knowledge in fluid systems design, plant control, and system integration. As of 2007 he has been acting as Chief Executive Officer of ANSALDO Nucleare. He is also Vice- President of the Italian Nuclear Association, member of the nuclear energy commission of the Italian National Standard Institute (UNI), and member of the Governing Board of the European Sustainable Nuclear Energy-Technology Platform.

Pietro Barabaschi is currently the Head of the Broader Fusion Development Department in F4E. Up to early 2006 he was deputy to the Project Leader and Head of the Design Integration Division of the ITER International Team at the Garching Joint Work Site. Soon after his university studies in electrical engineering, he joined the JET Project, Culham UK, where he worked in the Machine Development Department. In 1992 he joined the ITER Joint Central Team, San Diego Site, in the design integration division dealing with systems engineering and analysis.

Neil B. Morley, Adj. Professor at the Univ. of California, Los Angeles, has spent the past 20 years in fusion science and technology research & design, focusing his efforts on liquid metal breeding blankets, first wall, divertor component, and systems. He is currently Chairperson of the IEA-NTFR Liquid Breeder Blankets Subtask (2011-ongoing). In addition to publishing over 100 papers in scientific journals, over the years he has served on several US and international planning committees, including the US APEX Team (1998-2003), US ITER-TBM Team (2003-2009), and the ongoing US Roadmapping Panel (2009-).

Fusion Road Map Panel

Kunihiko Okano is currently Senior Researcher of the Central Research Institute of Electric Power Industry, while also acting as Project Professor at Keio University and Leader of Demo Design Activity in IFERC. He is a member of the Working Committee on Fusion Research in the Council for the Japanese government MEXT. He has served as Chair of Roadmap Committee of Fusion Energy Forum of Japan and Board Member of Directors of the Japan Society of Plasma Science and Fusion Research. His primary areas of research include tokamak and current-drive physics and conceptual design/strategy for future energy technology.

Boris Kuteev is Head of the Fusion reactor department at Kurchatov Centre's Institute for Tokamak Physics, where he designs demonstration fusion reactors and neutron sources in RF. He has over 30 years of related professional experience, mainly in pellet fueling/diagnostics, transport phenomena in tokamaks and helical systems, divertor and breeding blanket design, plasma surface interactions, fusion neutron sources and fusion-fission hybrids. From 1972, he has also been a professor, at the State Polytechnic Univ. of St. Petersburg, the NRC Kurchatov Institute and currently as Plasma Physics Chair of Moscow Engineering Physics Univ.

Industrial Workshop

Tuesday 17th September
Room 5

13:30- 14:20 **Opening**
Motojima, O., IO
Bindslev, H., F4E
Poncela, M.L., MINECO
Grau, A. Generalitat de Catalunya
Sánchez, J., CIEMAT

14:20-15:00 **Status of the ITER project, main on-going contracts and forthcoming opportunities (IO)**
Motojima, O.; Flament, F.

15:00-15:40 **Diagnostics and Assembly (IO)**
Walsh, M.

15:40-16:00 **ITER Nuclear Safety, Quality and Security (IO)**
Alejaldre, C.

16:00-16:30 **Coffee Break**

16:30-17:10 **Future developments: blanket technology and material engineering for FNT (IO/F4E)**
Raffray, R.; Knaster, J.
Q&A

17:10-17:30 **Overview of F4E activities, main on-going contracts and forthcoming opportunities (F4E)**
Filhol, J. M.

17:30-18:00 **HCD Systems & NBTF (F4E)**
Bonicelli, T.

18:00-18:30 **Plant Systems: Fuel Cycle and Cryoplant, WDS, ISS, WMS, REMS, (F4E)**
Teissier, A.
Q&A

18:30-19:15 **Round table: New collaborative approaches between industry and research centers**

Chair: Sanmartí, M. (IREC)

- CERN Anelli, G.
- FIIF (Fusion Industry Innovation Forum) Domínguez, M.
- F4E Saez, V.
- IO Guenter, J.

Poster Sessions

POSTER SESSION 1
Tuesday 17th September
16:00 – 18:00 Ground Floor
Chairs: Enoeda, M. and Moreno, C.

Topic A First-Wall Technology and High Heat Flux Components

P1-001 **The New Method of Creation of Plasma and its Fast Heating till Thermonuclear Temperatures**
Chikvashvili, I.

P1-003 **Fabrication of W/FMS joint mock-ups for first-wall using a hot isostatic pressing**
Jung, Y-I.; Park, J-Y.; C., B-K.; Lee, D. W.; Cho, S.

P1-004 **Design Strategy for the PFC in DEMO Reactor**
Igitkhanov, Y.; Bazylev, B.; Boccaccini, L.

P1-005 **Numerical study of the impact of hydrogen bombardment on the mechanical properties of tungsten**
Yu, X.; Gou, F.

P1-007 **Joining of HHF components applying electroplating technology**
Krauss, W.; Lorenz, J.; Konys, J.

P1-008 **Er2O3 coating: process optimization through film characterization**
Rayjada, P. A.; Vaghela, N. P.; Chauhan, N. L.; Sircar, A.; Rajendrakumar, E.; Manocha, L. M.; Raole, P. M.

P1-009 **Recent Advances of T-11m Lithium Program**
Lazarev, V.; Mirnov, S.; Djigailo, N.; Kostina, A.; Nesterenko, V.; Vertkov, A.; Lyublinski, I.

P1-010 **Helium-implanted CLAM steel and their annealing behavior investigated by positron-annihilation spectroscopy**
Cao, Q.; Ju, X.; Guo, L.; Wang, B.

P1-011 **Manufacturing of ITER pre-qualification Normal Heat Flux (NHF) First Wall (FW) 2 MW/m2 small-scale mock-ups and semi-prototype**
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P1-152 **ITER EC H&CD Upper Launcher: Design Options and Remote Handling Issues of the Waveguide Assembly**
Grossetti, G.; Aiello, G.; Chavan, R.; Geßner, R.; Goodmann, T.; Heemskerk, C.; Meier, A.; Ronden, D.; Scherer, T.; Schreck, S.; Späh, P.; Strauß, D.; Vaccaro, A.; Van Oosterhout, J.

P1-153 **Evaluation of a reconfigurable Modular robot system for inspection and maintenance tasks in nuclear fusion facility**
Pagala, P.; Ferre, M.; Aracil, R.

P1-154 **Progress in the design of the ITER Neutral Beam Cell Remote Handling System**
Van Uffelen, M.; Shuff, R.; Haist, B.; Damiani, C.; Choi, C-H; Tesini, A.

P1-155 **Design of a MGy radiation tolerant resolver-to-digital convertor IC for remotely operated maintenance in harsh environments**
Leroux, P.; Van Uffelen, M.; Damiani, C.; Hamilton, D.

Topic L Fission-Fusion Synergy and Cross-Cutting Technologies

P1-156 **MCNPX/ANSYS Fluent automatic coupling software**
Fabbri, M.; Colomer, C.; Alemán, A.; Salellas, J.

P1-157 **Conceptual Study of Fusion-Driven System for Nuclear Waste Transmutation**
Hong, B. G.

P1-158 **Rigorous 2-step shutdown dose rate calculation method based on mesh tally and its application to CLEAR-I**
Zheng, J.; Zou, J.; Yang, Q.; Zeng, Q. and the FDS Team

P1-159 **Integral neutron experiments for fusion -fission hybrid energy reactor**
Li, M.; Liu, R.; Zhu, T.

P1-160 **The Source Neutrons and Fuel Distribution Importance for Power Generation and Heat Transfer In Fusion-Fission Hybrids**
Wójcik, G.; Taczanowski, S.

POSTER SESSION 2
Wednesday 18th September
11:00 – 13:00 Ground floor
Chairs: Kuteev, B.V and García, A.

Topic A First-Wall Technology and High Heat Flux Components

P2-002 **Numerical Solutions for Liquid Metal MHD Flow in an L-Bend under a Uniform Magnetic Field**
Jing, Z.; Chen, L.; Ni, M-J

P2-003 **High heat flux testing of Normal Heat Flux First Wall (NHF FW) Mock-ups with calibrated defects**
Bellin, B.; Banetta, S.; Zacchia, F.; Davydov, V.; Kuznetsov, V.; Rulev, R.; Eaton, R.; Mitteau, R.; Raffray, R.

P2-004 **Study of laser-removal and structural changes of W:Al:C layer with Deuterium content**
Kubkowska, M.; Kowalska-Strzeciwilk, E.; Gasior, P.; Skrzeczanowski, W.; Fortuna-Zalesna, E.; Grzonka, J.

P2-005 **Stability of liquid metal thin film flow under varying heat load**
Jakobs, M.; Jaspers, R.; Kamp, L.; Lopes Cardozo, N.

P2-006 **Liquid Film First Wall Feasibility**
Okino, F.; Noborio, K.; Kasada, R.; Konishi, S.

P2-008 **Effect of induced damage on hydrogen isotope retention of F82H with impurity layer**
Shinoda, N.; Yamauchi, Y.; Nobuta, Y.; Hino, T.

P2-009 **Calorimetry and Electron Beam Control in Korea Heat Load Test Facility KoHLT-EB**
Kim, S-K.; Jin, H. G.; Shin, K. I.; Choi, B. G.; Lee, E. H.; Yoon, J.-S.; Lee, D. W.; Park, C. K.; Cho, S.

P2-010 **Underwater explosive welding of tungsten and reduced-activation ferritic steel F82H**
Mori, D.; Kasada, R.; Konishi, S.; Morizono, Y.; Hokamoto, K.

P2-011 **Progress in the design of Normal Heat Flux (NHF) First Wall panels**
Dellopoulos, G.; Jimenez, M.; Cicero, T.; Banetta, S.; Bellin, B.; Zacchia, F.; Calcagno, B.; Chappuis, P.; Gicquel, S.; Mitteau, R.; Raffray, R.

P2-012 **Characterization of HIP joints for ITER First Wall involving SS, Cu, CuCrZr and Be**
Ordas, N.; Galarza, N.; Moreno, E.; Nation, P.; Iturriza, I.; Garcia-Rosales, C.; Guilemany, J: M.; Iliescu, S.; Báscones, A.; Samaniego, F.

P2-014 **A solution for operation embrittlement of tungsten components: tungsten fibre-reinforced tungsten**
Riesch, J.; Buffière, J-I.; Höschen, T.; Di Michiel, M.; Scheel, M.; Wurster, S.; Linsmeier, C.; You, J-H.

P2-015 **Progress in Development and Application of Lithium Based Components for Tokamak**
Vertkov, A.; Lyublinski, I.; Zharkov, M.; Semenov, V.; Azizov, E.; Mirnov, S.; Lazarev, V.; Kostina, A.

P2-016 **High heat flux PLIF facility for the first wall component test**
Wang, Z.; Song, Y.; Huang, S.

P2-017 **Manufacture of 14 First Wall Mock-ups with calibrated defects**
Bobin, I.; Boireau, B.; Cottin, A.; Burat, O.; Lepers, F.; Banetta, S.; Zacchia, F.; Lorenzetto, P.

P2-018 **High Heat Flux Test of a Korea ITER TBM FW Mock-up**
Yoon, J. S.; Kim, S. K.; Lee, E. H.; Choi, B. G.; Shin, K. I.; Lee, D.W.; Cho, S.

P2-019 **Current Status of Structural Components Design of a Korean HCCR TBM in ITER**
Shin, K. I.; Lee, D. W.; Gon, J. H.; Lee, E. H.; Kim, S-K.; Yoon, J. S.; Ahn, M-Y.; Cho, S.

P2-020 **Comparison of hydrogen isotope retention for tungsten probes in LHD vacuum vessel during the experimental campaigns in 2011 and 2012**
Oya, Y.; Masuzaki, S.; Tokitani, M.; Kobayashi, M.; Taguchi, T.; Toda, K.; Uchimura, H.; Miura, R.; Yoshida, N.; Watanabe, H.; Yamauchi, Y.; Hino, T.; Miyamoto, M.; Hatano, Y.; Okuno, K.

P2-021 **Current Status of Plasma Facing Components for the WEST Project**
Missirlian, M.; Richou, M.; Firdaouss, M.; Hernandez, C.; Lipa, M.

P2-022 **Thermo-mechanical analysis of RMP coil system for EAST tokamak**
Wang, S.; Ji, X.; Song, Y.; Zhang, S.; Wang, Z.; Sun, Y.; Qi, M.; Liu, X.; Wang, S.; Yao, D.

P2-023 **Design of a monoblock type water cooled DEMO divertor using Eurofer as structural material**
Richou, M.; Li-Puma, A.

P2-024 **Mechanical properties of the advanced tungsten alloys**
Fukuda, M.; Saito, T.; Hasegawa, A.; Nogami, S.; Yabuuchi, K.; Muroga, T.

P2-025 **Experimental Try-out of IR Thermography Method for Final Acceptance Tests of the ITER Divertor Dome**
Tanchuk, V.; Grigoriev, S.; Makhankov, A.; Senik, K.; Yablokov, N.; Belenky, M.; Blinov, M.; Lebedev, M.; Fokin, B.

Topic B Blanket Technology

P2-026 **Interaction of tritium and helium with lithium -lead eutectic under reactor irradiation**
Tazhibayeva, I.; Kulsartov, T.; Kenzhin, E.; Zaurbekova, Z.; Ponkratov, Y.; Gordienko, Y.; Barsukov, N.; Tulubaev, E.

P2-027 **Development of Lithium meta-titanate Ceramics pebbles for Indian LLCB TBM**
Shrivastava, A.; Makwana, M.; Chaudhuri, P.; Rajendrakumar, E.

P2-028 **Measurements of the purge helium pressure drop across pebble beds packed with lithium orthosilicate and glass pebbles**
Abou-Sena, A.; Arbeiter, F.; Boccaccini, L.; Schlindwein, G.

P2-029 **A Neutron Poison Tritium Breeding Controller Applied to a HCPB Fusion Reactor Model**
Morgan, L.; Packer, L.

P2-030 **Optimised mass flow rate distribution analysis for cooling the ITER Blanket System**
Pérez, G.; Mitteau, R.; Furmanek, A.; Martin, A.; Raffray, R.; Merola, M.

P2-031 **Simple Thought Experiment to Examine Benchmark Performance for Fusion Nuclear Data**
Murata, I.; Ohta, M.; Miyamaru, H.

P2-032 **Mechanical Behaviors of FCI in Thermo-Magneto-Structure Coupling Field**
Li, M-J.; Yu, X-G.; Ni, M-J.; Zhang, N-M.

P2-033 **Electrical Connectors for Blanket Modules in ITER**
Poddubnyy, I.; Danilov, I.; Calcagno, B.; Chappuis, P.; Khomiakov, S.; Kolganov, V.; Raffray, R.; Roccella, R.; Sadakov, S.; Ulrickson, M.

P2-034 **Dynamic Analysis of the ITER Blanket Attachment System**
Khomiakov, S.; Kolganov, V.; Poddubnyy, I.; Sadakov, S.; Vlasov, D.

P2-035 **Ultrasonic Doppler Experimental Research of Gas Bubble Rising in Liquid Metal under a Strong Magnetic Field**
Wang, Z. H.; Wang, S. D.; Meng, X.; Ni, M. J.

P2-036 **MHD analysis of Lead lithium flow in a duct consisting of circular and square cross-sections under high magnetic field**
Swain, P. K.; Tiwari, V.; Sahu, S.; Polepalle, S.; Bhattacharyay, R.; Patel, A.; Platacis, E.; Shisko, A.

P2-037 **Trapping of deuterium dissolved in fluidized Li by Y**
Fukada, S.; Hiromoto, T.; Shigeharu, S.; Sugie, K.; Edao, Y.

P2-038 **Liquid Metal MHD studies with non-magnetic and ferro-magnetic structural material**
Patel, A.

P2-039 **Progress in Engineering Design of Indian LLCB TBM Set for testing in ITER**
Chaudhuri, P.; Ranjithkumar, S.; Sharma, D.; Danani, C.; Swami, H. L.; Bhattacharay, R.; Rajendra, K. E.; Vyas, K. N.

P2-040 **In-situ impedance measurement of corrosion interface in liquid metals**
Kondo, M.; Suzuki, N.; Nakajima, Y.; Muroga, T.; Tanaka, T.

P2-041 **Structural Design and Thermal-Hydraulic Analysis of Liquid Lead-Lithium Tritium Breeder Blanket for China Fusion Engineering Testing Reactor**
Li, M.; Ni, M.; Lian, C.; Wang, W.; Jiang, J.; Zeng, Q.; Wu, Y.

P2-042 **Influence of surface condition on deuterium release from Li2TiO3 pebble**
Tsuchiya, A.; Hino, T.; Yamauchi, Y.; Nobuta, Y.; Akiba, M.; Enoeda, M.

P2-043 **MHD LiPb Flow and analysis of thermal stress of structure and First Wall in DLL Blanket**
Wang, H.; Tang, C.

P2-045 **Measurement of Hydrogen Isotope Concentration in Erbium Oxide Coatings**
Sato, R.; Chikada, T.; Matsuzaki, H.; Suzuki, A.; Terai, T.; Sugiyama, K.; Maier, H.

P2-046 **Neutronic assessment of a dual-coolant blanket design for DEMO**
Palermo, I.; Veredas, G.; Gómez-Ros, J. M.; Sanz, J.

P2-047 **Behaviour of the Pb-Li Eutectic Alloy Impurities by ICP-MS**
Conde, E.; Barrado, A.I; Pascual, L.; Fernández, M.; Gómez de Salazar, J.M.; Barrena, M.I; Quiñones, J.

P2-048 **Testing of Porous SiC With Dense Coating Under Relevant Conditions for Flow Channel Insert Application**
Bereciartu, A.; Ordas, N.; Garcia-Rosales, C.; Moroño, A.; Malo, M.; Hodgson, E.; Peñalva, I.; Alberro, G.; Abellà, J.; Colominas, S.; Sedano, L.

P2-050 **Interaction of titanium beryllide with steam at high temperatures**
Munakata, K.; Hara, K.; Akimoto, Y.; Takeda, H.; Wada, K.; Kim, J-H.; Nakamich, M.

P2-051 **Determination of the protective atmosphere during the Pb-Li alloy fusion. Part I. Furnace atmosphere and temperature.**
Pascual, L.; Barrena, M. I.; Gómez de Salazar, J.M.; Soria, A.; Fernández, M.; Conde, E.; Quiñones, J.

P2-052 **Definition of the key parameter for production of eutectic Pb-Li alloys. Part II. Mass balance and temperature.**
Pascual, L.; Barrena, M. I.; Gómez de Salazar, J. M.; Soria, A.; Fernández, M.; Conde, E.; Quiñones, J.

P2-053 **Effect of post-weld heat treatment on irradiation hardening of the weld metal of low activation vanadium alloys**
Kometani, N.; Nagasaka, T.; Hishinuma, Y.; Muroga, T.; Yoshiie, T.; Kubo, S.; Miyazawa, T.

P2-054 **Loop heat pipes for energy conversion in fusion reactors**
Dobran, F.

P2-055 **First Wall Assembly Technologies of 1/3 Scale China Test Blanket Module**
Huang, B.; Li, C.; Zhong, B.; Wu, Q.; Huang, Q.

P2-056 **Neutronics analysis of the shielding performance of HCCB TBM**
Li, Z.; Feng, K.; Zhao, F.; Wang, Q.

P2-057 **Design Progress and Performance evaluation of a Korean HCCR TBM in ITER**
Lee, D. W.; Jin, H. G.; Shin, K. I.; Lee, E. H.; Kim, S. K.; Yoon, J. S.; Ahn, M-Y.; Cho, S.

P2-058 **Numerical Analysis of the Heat Transfer Coefficient for Blanket Shield Block by Simplified 3D Model**
Jung, H-C.; Kim, D-H.; Kim, S-W.; Ha, M-S.; Heo, Y-G.; Ahn, H-J.; Lee, H-G.; Jung, K-J.

P2-059 **Manufacturing and Testing of Full Scale Prototype for ITER Blanket Shield Block**
Kim, S.-W.; Kim, D-H.; Jung, H-C.; Lee, S-K.; Park, H-K.; Kang, S-C.; Lee, D-H.; Zhang, F.; Kim, B-Y.; Ahn, H-J.; Lee, H. G.; Jung, K-J.

Topic C Fuel Cycle and Tritium Processing

P2-060 **Numerical modelling of a tapered Holweck vacuum pump via linear kinetic theory**
Naris, S.; Tantos, C.; Valougeorgis, D.; André, J.; Millet, F.; Perin, J. P.

P2-061 **Design and development of hydrogen isotope sensor in liquid Pb-Li**
Sircar, A.; Sharma, S. K.; Patel, R. B.; Rayjada, P. A.

P2-062 **Design and R&D Activities of TriPla-CA Consortium in support of ITER Tritium Plant development**
Cristescu, I.; Ana, G.; Michling, R.; Petrutiu, C.; Pinna, T.; Stefanescu, A.; Welte, S.

P2-064 **DINS method for diagnosing fuel retention in plasma facing components**
Perelli, E.; Gorini, G.; Tardocchi, M.; Pietropaolo, A.

P2-066 **Design Concept of the ITER SDS Getter Bed**
Yun, S-H.; Kang, H-G.; Chang, M.; Cho, S.; Lee, H. G.; Jung, K. J.; Chung, H.; Sohn, S-H.; Song, K-M.; Camp, P.; Willms, S.; Glugla, M.

P2-067 **Direct Measurement of Tritium Production Rate in LiPb with removed parasitic activities: preliminary experiments.**
Pohorecki, W.; Kuc, T.; Ostachowicz, B.

P2-068 **R&D on Hydrogen in the Liquid Lithium Loop for TechnoFusion**
González-Del Moral, O.; Moral Fernández, N.; Álvarez Ruiz, J.; García, A.; Casal, N.; Abánades, A.; Ibarra, A.; Perlado, J. M.

P2-069 **Separation of fuel and Impurity particles using divertor simulator TPD-Sheet IV**
Maekawa, T.; Tanaka, S.; Iijima, T.; Hagiwara, S.; Tonegawa, A.; Sato, K.; Kawamura, K.

Topic D Material Engineering for FNT

P2-070 **TEM Characterization of He Effects in First-Wall Structural Materials Under Fusion Relevant Conditions**
Kurtz, R.; Yao, B.; Edwards, D.

P2-071 **Depth-dependent nanoindentation hardness of reduced-activation ferritic steels after MeV Fe-ion irradiation**
Kasada, R.; Konishi, S.; Ando, M.; Hamaguchi, D.; Tanigawa, H.

P2-072 **Diffusion Bonding of 9Cr ODS Ferritic/martensitic Steel with the Phase Transformation**
Noh, S.; Kimura, A.; Choi, B.; Kang, S-H; Han, C-H.; Kim, K-B.; Kim, T. K.

P2-073 **Fatigue Property Change of Pure Tungsten Due to Heat Treatment**
Nogami, S.; Iwata, T.; Fukuda, M.; Kurishita, H.; Hasegawa, A.; Yabuuchi, K.

P2-074 **Selection of technology manufacturing ITER blanket modules flexible attachment from Ti-6Al-4V alloy**
Rodchenkov, B.; Strebkov, Y.; Evseev, M.; Shushlebin, V.; Sinelnikov, L.

P2-075 **Numerical study of the flow conditioner for the IFMIF liquid lithium target**
Gordeev, S.; Heinzel, V.; Stieglitz, R.

P2-076 **Neutronic analysis for the IFMIF EVEDA Reference Test Cell and Test Facility**
Kondo, K.; Arbeiter, F.; Fischer, U.; Große, D.; Heinzel, V.; Klix, A.; Lu, L.; Mittwollen, M.; Serikov, A.; Tian, K.; Weber, V.

P2-077 **Microstructural studies and surface analysis of laser irradiated in-situ Co–TiC composites.**
Kowalska-Strzeciwilk, E.; Strzeciwilk, D.; Kubkowska, M.; Skrzeczanowski, W.; Figacz, W.

P2-078 **Stress envelope of silicon carbide composites at elevated temperatures**
Nozawa, T.; Ozawa, K.; Tanigawa, H.

P2-079 **Fabrication and Characterization of Reference 9Cr and 12Cr-ODS Low Activation Ferritic/Martensitic Steels**
Muroga, T.; Nagasaka, T.; Li, Y.; Abe, H.; Ukai, S.; Kimura, A.; Okuda, T.

P2-080 **Effect of potential factors in manufacturing process on mechanical properties of F82H plate**
Sakasegawa, H.; Tanigawa, H.; Tanigawa, H.; Hirose, T.

P2-081 **Blanket material and technology developments toward DEMO under the Broader Approach framework**
Nishitani, T.; Yamanishi, T.; Tanigawa, H.; Nakamichi, M.; Nozawa, T.; Hoshino, T.

P2-082 **Effect of Laser Beam Position on Mechanical Properties of F82H/SUS316L Butt-Joint Welded By Fiber Laser**
Serizawa, H.; Mori, D.; Ogiwara, H.; Mori, H.

P2-083 **Overview of the Ceramic Breeder Materials Development**
Chen, X.; Peng, S.; Xiao, C.; Gao, X.

P2-084 **Influence of Cr Content On the Diffusive Transport Parameters and Trapping of Hydrogen in Fe Alloys**
Peñalva, I.; Alberro, G.; Legarda, F.; Ortiz, C. J.; Vila, R.

P2-085 **Annealing behavior of heavily neutron-irradiated beta-SiC on swelling and thermal diffusivity**
Akiyoshi, M.; Yano, T.; Tachi, Y.

P2-086 **First principles modelling of the initial steps of the ODS particle formation process in the alpha-Fe lattice.**
Mastrikov, Y.; Vladimirov, P.; Borodin, V.; Gopejenko, A.; Zhukovskii, Y.; Kotomin, E.; Möslang, A.

P2-087 **Observation of the Li target in the EVEDA Li Test Loop**
Kondo, H.; Kanemura, T.; Furukawa, T.; Hirakawa, Y.; Groeschel, F.; Wakai, E.

Topic E Vacuum Vessel

P2-088 **Gas Exchange Processes on Stainless Steel Vessel Wall due to Interaction with Oxygen Contaminated Hydrogen Plasma.**
Begrambekov, L.; Grunin, A.; Ermakov, V.; Kaplevsky, A.; Sadovsky, Y.; Shigin, P.; Vergasov, S.

P2-089 **Ultrasonic Examination Feasibility Study for ITER Vacuum Vessel from Korea Domestic Agency**
Lee, Y. J.; Kim, B. C.; Hong, K. H.; Kim, H. S.; Park, C. K.; Kim, G. H.; Ahn, H. J.; Jung, Y. H.; Sa, J. W.; Choi, C. H.

P2-090 **Thermocouple fixation and High Heat Flux Test on the ITER Neutral Beam Duct Liner mock-up**
Park, C. K.; Kim, H. S.; Kim, G. H.; Lee, Y. J.; Kim, B. C.; Ahn, H. J.; Kim, S. K; Lee, D. W.; Urbani, M.

P2-091 **Multi-Scenario Evaluation, Specification and Comparison of Electromagnetic Loads on ITER Vacuum Vessel**
Rozov, V.; Martinez, J-M.; Portafaix, C.; Sannazzaro, G.

P2-092 **Design and fabrication of the ITER thermal shield**
Her, N.; Hamlyn-Harris, C.; Le Barbier, R.; Utin, Y.; Choi, C-H.; Sborchia, C.; Chung, W.; Nam, K.; Noh, C. H.; Kang, D. K.; Kang, K-O.

P2-093 **Thermal-hydraulic analysis of ITER Vacuum Vessel Field Joints**
Savoldi, L.; Bonifetto, R.; Corpino, S.; Izquierdo, J.; Le Barbier, R.; Utin, Y.; Zanino, R.

P2-094 **Status of the ITER Vacuum Vessel Construction**
Choi, C. H.; Alekseev, A.; Sborchia, C.; Ioki, K.; Giraud, B.; Utin, Yu.; Sa, J.W.; Wang, X.; Barabash, V.; Vertongen, P.; Jucker, P.; Bayon, A.; Pathak, H.; Raval, J.; Ahn, H.J.; Kim, B.C. ; Kuzmin, E.; Savrukhin, P.

P2-095 **Mechanical Testing of the ITER Vacuum Vessel Support Structure - Coating Screening Tests and High Load Multi-Axial Mock Up Tests**
Zauner, C.; Reindl, M.; Le Barbier, R.; Choi, C. H.; Ahn, H-J.

P2-096 **Structural Analysis of the ITER Vacuum Vessel regarding 2012 ITER Project-Level Loads**
Martinez, J-M.; Choi, C-H.; Ioki, K.; Jun, C. H.; Portafaix, C.; Sborchia, C.; Cambazar, M.; Corti, P.; Pinori, K.; Sfarni, S.; Tailhardat, O.; Borrelly,S.; Albin, V.; Pelletier, N.

P2-097 **F4E strategy for the electromagnetic analysis of ITER components**
Testoni, P.; Cau, F.; Portone, A.; Albanese, R.; Guirao, J.

P2-098 **Structural Response of ITER Vacuum Vessel to Combustion Pressure Loads**
Kuznetsov, M.; Xiao, J.; Jordan, T.

P2-099 **Thermo-structural optimization of the ITER ICRH Four Port Junction and Straps against in-vessel design criteria**
Lafuente, A.; Fursdon, M.; Shannon, M.

Topic F Nuclear System Design

P2-101 **ITER Components Cooling: Satisfying the Distinct Needs of Systems and Components**
Ployhar, S.; Gopalapillai, B.; Teodoros, L.; Dell Orco, G.; Kumar, A.; Gupta, D.; Patel, N.; Jadhav, M.

P2-103 **Nuclear Analysis and Shielding Optimisation in Support of the ITER In-Vessel Viewing System Design**
Turner, A.; Ghani, Z.; Hurst, G.; Lo Bue, A.; Mangham, S.; Pampin, R.; Puiu, A.; Zheng, S.

P2-104 **RF coupler tests of the prototype RFQ linac for the IFMIF/EVEDA project**
Maebara, S.; Palmieri, A.; Mereu, P.; Ichikawa, M.; Takahashi, H.; Comunian, M.; Suzuki, H.; Pisent, A.; Sugimoto, M.

P2-105 **The simulation of seismic analysis for ITER fourth PF (Poloidal Field Coil) feeder**
Liu, S.; Chen, W.; Song, Y.; Ni, X.; Wang, Z.; Chen, Y.; Gong, C.

P2-106 **Neutronic Analyses for the ITER electron cyclotron-heating upper launcher**
Weinhorst, B.; Serikov, A.; Fischer, U.; Spaeh, P.; Strauss, D.

P2-107 **Improved Algorithms and Advanced Features for the CAD to MC conversion tool McCad**
Lu, L.; Pereslavtsev, P.; Fischer, U.

P2-108 **Neutronic analyses of the HCPB DEMO reactor using a consistent integral approach**
Pereslavtsev, P.; Fischer, U.; Lu, L.

P2-109 **Shut-Down Dose Rate Analysis for ITER Diagnostic Equatorial and Upper Ports**
Serikov, A.; Bertalot, L.; Fischer, U.; Pitcher, C. S.; Suarez, A.; Udintsev, V. S.; Weinhorst, B.

P2-110 **An Exploratory Study on the Engineered Safety Features of a Fusion DEMO Plant**
Kim, H. J.; Chung, B-D.; Hwang, Y.

P2-112 **Effect of the Impurity on the Activation Analysis for the Korean HCCR TBM**
Lee, C-W.; Ahn, M-Y.; Park, Y-H.; Lee, Y-O.; Lee, D. W.; Cho, S.; Kim, H. I.; Kim, J. W.

Topic G Safety Issues and Waste Management

P2-113 **MFM-Based Diagnostic Technology for ITER DFLL-TBM System**
Run, Y.; Liqin, H.; Muyi, N.; Rongxiang, H.; Dagui, W.

P2-114 **Evaluation of the neutron activation of JET in-vessel components following D-T irradiation**
Vuolo, M.; Bonifetto, R.; Dulla, S.; Heinola, K.; Lengar, I.; Ravetto, P.; Savoldi Richard, L.; Villari, R.; Widdowson, A.; Zanino, R. and JET EFDA Contributors*

P2-115 **Tritium and Heat Management in ITER Test Blanket Systems Port Cell for Maintenance Operations**
Giancarli, L.; Cortes, P.; Iseli, M.; Le Petit, L.; Levesy, B.; Livingston, D.; Nevière, J-C.; Pascal, R.; Ricapito, I.; Shu, W.; Wyse, S.

P2-116 **Little Tritium Extraction System Pipe Break Environmental Impact by Atmospheric Modelling of Elemental Tritium Gas and HTO Transport**
Castro, M. P.; Velarde, M.; Ardao, J.; Perlado, J. M.; Sedano, L. A.

P2-118 **Visualized Nuclear and Radiation Safety Simulation Program and Its Application to Fusion and Fission**
He, T.; Shang, L.; Zhou, S.; Zhao, J.; Zhang, S.; Li, T.; Yang, Z.; Cheng, X.; Yang, Q.; Dang, T.; Zou, J.; Zeng, Q.; Long, P.; Hu, L.; Wu, Y. and the FDS Team

P2-119 **Safety managements of the IFMIF/EVEDA accelerator building**
Takahashi, H.; Maebara, S.; Kojima, T.; Narita, T.; Tsutsumi, K.; Sakaki, H.

P2-120 **Sensitivity study for a TES pipe rupture accident inside port cell**
Jin, H. G.; Ahn, M-Y.; Cho, S.; Lee, D. W.; Lee, E. H.; Kim, S. K.; Yoon, J. S.

P2-121 **Study on Safety Requirements of Korean Fusion DEMO Plant using Integrated Safety Assessment Methodology**
Oh, K.; Kang, M.-S; Heo, G.; Kim, H-C.

P2-122 **ITER Safety Studies: The effect of two simultaneous perturbations during a Loss of Plasma Control Transient**
Rivas, J. C.; Dies, J.

P2-123 **Neutron shielding and activation of the MASTU device and surrounds**
Taylor, D.; Lilley, S.; Turner, A.; Davis, A.

Topic H Models and Experiment for FNT

P2-125 **Characterization of MHD mixed-convection flows in a vertical rectangular duct with volumetric heating**
Vetcha, N.; Smolentsev, S.; Abdou, M.

P2-126 **Experimental Validation of the ITER Blanket Attachments**
Kolganov, V.; Danilov, I.; Kalinin, G.; Khomiakov, S.; Poddubnyy, I.; Parshutin, E.; Raffray, R.; Sadakov, S.; Chappuis, P.; Vlasov, D.; Zhmakin, A.

P2-127 **Safety analyses in support of neutron detector calibration operations**
Stankunas, G.; Syme, B.; Popovichev, S.; Conroy, S.; Batistoni, P. and JET EFDA Contributors

P2-128 **Development of Compact D-D Neutron Generator**
Das, B.; Shyam, A.; Das, R.; Rao, A.; Durga P.

P2-129 **Parametrization of radiative properties of ICF mono- and multi-component plasmas**
Espinosa, G.; Rodríguez, R.; Gil, J. M.; Florido, R.; Rubiano, J.; Mendoza, M. A.; Martel, P.; Mínguez, E.

P2-130 **Benchmarking of SuperMC2.0 with Fusion-Driven Subcritical System**
Zheng, H.; Sun, G.; Song, J.; Hao, L.; Chen, Z.; Li, G.; Wu, M.

P2-131 **Support of Repeated Structure For Automatic Neutronics Modeling**
Gan, Q.; Wang, G.; Yu, S.; Wang, D.; Long, P.; Xiong, J.; Wu, Y. and FDS Team

P2-133 **Benchmark Experiment on Titanium with DT Neutron at JAEA/FNS**
Ohta, M.; Takakura, K.; Ochiai, K.; Sato, S.; Konno, C.

P2-134 **Effect of impurities on vacancy migration energy in Fe-based alloys**
Hashimoto, N.; Tanimoto, J.; Ohnuki, S.

P2-135 **Conceptual design of a helium heater for high temperature applications**
Jin, X. Z.; Chen, Y.; Ghidersa, B-E.

P2-136 **Study of the sensitivity of a Cerenkov Fibre Optics Sensor (C-FOS) in the IFMIF Test Cell**
Rapisarda, D.; Gómez-Ros, J. M.; Mota, F.; García, A.; Gouat, P.; Leysen, W.; Mas, A.; Mollá, J.; Ibarra, A.

P2-137 **Design prospect of remountable high-temperature superconducting magnet**
Hashizume, H.; Ito, S.

P2-138 **Molecular dynamics simulations to evaluate the nano-mechanism responsible for irradiation hardening in alpha-iron**
Okita, T.; Fujita, S.; Itakura, M.

P2-139 **Verification of the displacement damage processes by STM observation at atomistic spatial resolution**
Hirabayashi, J.; Sato, M.; Okita, T.

Topic I Repair and Maintenance

P2-140 **Development of a brazing connector for DEMO in-vessel components**
Fernández, I.; Rosa, E. V.; Palermo, I.

P2-141 **Maintenance Duration Estimate for a Fusion Power Plant based on the EFDA DEMO 2012 design concept**
Crofts, O.; Harman, J.

P2-142 **Concept for a Vertical Maintenance Remote Handling System for Multi Module Blanket Segments in DEMO**
Coleman, M.; Sykes, N.; Loving, A.; Harman, J.

P2-143 **Progress in the design, R&D and procurement preparation of the ITER Divertor Remote Handling System**
Esque, S.; Van Hille, C.; Damiani, C.; Ranz, R.; Palmer, J.; Hamilton, D.

P2-144 **DEMO Active Maintenance Facility Progress 2012**
Thomas, J.; Loving, A.; Crofts, O.; Morgan, R.; Harman, J.

P2-145 **ITER divertor Thomson scattering system: in-vessel movements and remote handling kinematics**
Kochergin, M.; Mukhin, E.; Safronov, A.; Razdobarin, A.; Semenov, V.; Tolstyakov, S.; Kurskiev, G.; Masyukevich, S.; Bukreev, I.; Chernakov, P.; Litvinov, A.; Koval, A.; Vecherkovsky, A.; Egorov, P.; Walsh, M.; Andrew, P.

P2-146 **Design of the remote handling equipment for the refurbishment of the European target assembly design for IFMIF**
Miccichè, G.; Lorenzelli, L.; Bernardi, D.; Frascati, F.; Becchi, F.

P2-147 **Hardware availability calculations and results of the IFMIF accelerator facility**
Bargalló, E.; Arroyo, J. M.; Abal, J.; Beauvais, P-Y.; Gobin, R.; Orsini, F.; Weber, M.; Podadera, I.; Grespan, F.; Fagotti, E.; Dies, J.; Tapia, C.; De Blas, A.; Molla, J.; Ibarra, A.

P2-148 **RAMI status in the IFMIF Test Facilities at the end of the engineering design phase**
Abal, J.; Dies, J.; Arroyo, J. M.; Bargalló, E.; García, A.; Casal, N.; Mas, A.; Tapia, C.; De Blas, A.; Molla, J.; Ibarra, A.

P2-149 **Availability simulation software adaptation to the IFMIF accelerator facility RAMI analysis**
Bargalló, E.; Sureda, P. J.; Arroyo, J. M.; Abal, J.; De Blas, A.; Dies, J.; Tapia, C.; Molla, J.; Ibarra, A.

P2-150 **Improving the performance of DTP2 bilateral teleoperation control system with haptic augmentation**
Viinikainen, M.; Tuominen, J.; Mattila, J.

P2-151 **Design of Structural Components for the helical DEMO reactor FFHR-d1**
Tamura, H.; Goto, T.; Tanaka, T.; Masuzaki, S.; Yanagi, N.; Miyazawa, J.; Sagara, A.

P2-152 **A R&D program on Leak localization concepts for actively cooled fusion machines**
Durocher, A.; Bruno, V.; Chantant, M.; Gargiulo, L.; Hatchressian, J-C.; Houry, M.; Mouyon, D.; Anthoine, D.

P2-153 **RAMI analysis in IFMIF remote handling operations**
Abal, J.; Dies, J.; Baeza, E.; Arroyo, J. M.; Bargalló, E.; García, A.; Tapia, C.; De Blas, A.; Molla, J.; Ibarra, A.

P2-154 **Test of the Piezoceramic Motor Technology in ITER Relevant High Magnetic Fields**
Monti, C.; Besi, U.; Mugnaini, G.; Neri, C.; Rossi, P.; Dubus, G.; Damiani, C.

Topic J Burning Plasma Control and Operation

P2-155 **Plasma current sustainement after iron core saturation in the STOR-M tokamak**
Mitarai, O.; Ding, Y.; Hubeny, M.; Lue, Y.; Onchi, T.; McColl, D.; Xiao, C.; Hirose, A.

P2-157 **Consequences of plasma disruption mitigation by massive gas injection on the ITER torus cryopumping system**
Scannapiego, M.; Day, C.; Hauer, V.

P2-158 **Numerical simulation of ELMy H-mode in EAST using SOLPS**
Du, H.; Sang, C.; Wang, L.; Sun, J.; Wang, D.

P2-159 **Conceptual design of dc power system for superconducting magnet of helical DEMO reactor FFHR-d1**
Chikarasihi, H.; Goto, T.; Sagara, A.; FFHR Design Group

P2-160 **Upgrade of the IR thermography diagnostic for the WEST project**
Courtois, X.; Aumeunier, M-H.; Joanny, M.; Balorin, C.; Jouve, M.; Micolon, F.; Salasca, S.

P2-161 **Neutronic Analysis for design of ITER IR thermography**
Ishikawa, M.; Shimada, T.; Takeuchi, M.; Sugie, T.

P2-162 **Matrix Converter Design for Feedback Stabilization of Vertical Position Instability on QUEST**
Nakamura, K.; Fujita, H.; Liu, X.; Xue, E.; Mitarai, O.; Hasegawa, M.; Tokunaga, K.; Zushi, H.; Hanada, K.; Fujisawa, A.; Matsuoka, K.; Idei, H.; Nagashima, Y.; Kawasaki, S.; Nakashima, H.; Higashijima, A.

P2-163 **Projection of foreseeable integrated plasma performance to DEMO**
Sakamoto, Y.; Nakamura, M.; Tobita, K.; Asakura, N.; Hoshino, K.; Utoh, H.; Someya, Y.

POSTER SESSION 3
Thursday 19th September
16:00- 18:00 Ground floor
Chairs: Konishi, S. and Sanmartí, M.

Topic A First-Wall Technology and High Heat Flux Components

P3-001 **Hydrogen Retention in Plasma Facing Materials: The Influence of Material Microestructure**
Panizo, M.; Gordillo, N.; Munnik, F.; Saravanan, K.; Tejado, E.; Pastor, J. Y.; Perlado, J. M.; Gonzalez, R.

P3-002 **Study of experimental simulations for the closed divertor using divertor simulator TPD-Sheet IV**
Kobayashi, H.; Tanaka, S.; Iijima, T.; Tonegawa, A.; Kawamura, K.; Sato, K.

P3-003 **Deflection of a liquid metal jet in a tokamak environment**
Pelekasis, N.; Gomes, R.

P3-005 **Operational impact on the JET ITER-like wall in-vessel components**
Riccardo, V.; Arnoux, G.; Collins, S.; Lomas, P.; Matthews, G.; Pace, N.; Thompson, V.

P3-007 **The Remote Handling Compatibility Analysis of the ITER Generic Upper Port Plug structure**
Ronden, D.; Elzendoorn, B.; Goodman, T.; Grossetti, G.; Heemskerk, C.; Van Oosterhout, J.; Spaeh, P.; Schreck, S.; Strauss, D.

P3-008 **Preliminary results on tungsten tile test in KSTAR**
Hong, S-H.; Bang, E-N.; Litnovsky, A.; Hellwig, M.; Seo, D-C.; Lho, T.

P3-009 **Measurement and calculations of long-lived radionuclide activity forming in the fast neutron field in ITER vacuum vessel composites**
Pohorecki, W.; Jodlowski, P.; Pytel, K.; Prokopowicz, R.

P3-010 **Comparison between FEM and High Heat Flux Thermal Fatigue Testing results of ITER Divertor Plasma Facing mock-ups**
Crescenzi, F.; Roccella, S.; Visca, E.

P3-011 **Development of a Plasma Driven Permeation Experiment for TPE**
Buchenauer, D.; Kolasinski, R.; Shimada, M.; Donovan, D.; Youchison, D.; Merrill, B.

P3-012 **Quality Evaluation of Hip Joints Using Ultrasonic Technique**
Galarza, N.; De Miguel, D.; Ordas, N.; Rubio, B.; Iturriza, I.; Moreno, E.; Gorrotxategi, A.; Nation, P.; Guilemany, J. M.; Samaniego, F.

P3-013 **Modeling First Wall Mechanical Fracture due to Thermal Shocks Using X-FEM**
Garoz Gómez, D.; Rivera, A.; González-Arrabal, R.; Álvarez, J.; Perlado, J. M.

P3-016 **First wall design for compact tokamak – neutron source.**
Shpanskiy, Y.; Kilischenko, A.; Kuteev, B.; Petrov, V.

P3-017 **Tracer Techniques in the Assessment of Erosion and Property Modification of Plasma-Facing Components**
Rubel, M.; Petersson, P.; Möller, S.; Garcia-Carrasco, A.; Ivanova, D.; Brezinsek, S.; Coenen, J.; Kreter, A.; Philipps, V.; Wauters, T.

P3-020 **Defect Evolution In Tungsten Under Helium Irradiation: A Comparison With Experimental Results.**
Valles, G.; Martín-Bragado, I.; González-Arrabal, R.; Gordillo, N.; Caturla, M. J.; Perlado, J. M.; Rivera, A.

P3-021 **Impact of repeated high heat loading on surface modification of tungsten materials**
Tokunaga, K.; Ukita, T.; Araki, K.; Fujiwara, T.; Miyamoto, Y.; Hasegawa, M.; Nakamura, K.; Kurishita, H.

P3-023 **Effect of transient heating loads on beryllium**
Kupriyanov, I.; Porezanov, N; Nikolaev, G.; Kurbatova, L.; Podkovyrov, V.; Muzichenko, A.; Zhitlukhin, A.; Khimchenko, L.; Gervash, A.

P3-024 **Development of Materials for the First Wall of a Nuclear Fusion Reactor**
Garoz, D.; Fernández-Martínez, I.; González-Arrabal, R.; Rivera, A.; Gordillo, N.; Panizo-Laiz, M.; Vallés, G.; Briones, F.; Perlado, J. M.

P3-025 **Status of the IDTF high-heat-flux test facility**
Kuznetcov, V.; Gorbenko, A.; Davydov, V.; Kokoulin, A.; Komarov, A.; Mazul, I.; Mudygin, B.; Ovchinnikov, I.; Stepanov, N.; Rulev, R.; Volodin, A.

P3-026 **Computational Methodology For Study Nuclear Fusion Materials And Systems**
Garoz, D.; Guerrero, C.; del Río, E.; Cereceda, D.; Prada, A.; Rivera, A.; Fraile, A.; Valles, G.; Moral, N.; Álvarez, J.; Juárez, R.; Sánchez, C.; Sanz, J.; Páramo, A.; Sordo, F.; Perlado, J. M.

Topic B Blanket Technology

P3-027 **Numerical study of the MHD flow characteristics in a three-surface-multi-layered channel with different inlet conditions**
Aoyagi, M.; Ito, S.; Hashizume, H.

P3-028 **Fabrication and characteristics of SiC-coated graphite pebbles for HCCR TBM**
Lee, Y.; Yun, Y-H.; Park, Y-H.; Ahn, M-Y.; Cho, S.

P3-029 **Evaluation of the Response Time of H-Concentration Probes for Tritium Sensors**
Abella, J.; Colominas, S.; Llivina, L.

P3-030 **Development of a Hydrogen Permeation Sensor for Future Tritium Applications**
Colominas, S.; Abella, J.; Llivina, L.

P3-031 **Current Status of Accident Analysis for Korean HCCR TBS**
Ahn, M-Y.; Jin, H. G.; Cho, S.; Lee, D. W.; Ku, D. Y.; Park, Y-H.; Kim, C-S.

P3-032 **Analysis of Electromagnetic Loads on EU-DEMO Inboard and Outboard Blanket Vertical Segments**
Maione, I. A.; Vaccaro, A.

P3-033 **On the numerical assessment of the thermo-mechanical performances of the DEMO Helium-Cooled Pebble Bed breeding blanket module**
Di Maio, P. A.; Arena, P.; Boccaccini, L. V.; Bongiovì, G.; Carloni, D.; Giammusso, R.; Kecskes, S.

P3-034 **Study on effect of moderating materials on Tritium Production Rate in IN-LLCB TBM**
Gathibandhe, M.; Goverdhan, P.; Vyas, K.; Danani, C.

P3-035 **Neutronics of LiPb blanket and design and evaluation of integral experiment with D-D neutrons**
Kwon, S.; Sato, S.; Kasada, R.; Konishi, S.

P3-036 **Influence of chemisorption products of carbon dioxide on radiolysis of tritium breeding ceramic**
Zarins, A.; Kizane, G.; Knitter, R.; Supe, A.

P3-037 **Gas Absorption and Discharge Behaviors of Lithium-lead**
Sakabe, T.; Kunugi, T.; Yokomine, T.; Kawara, Z.; Ueki, Y.

P3-038 **Numerical Simulation of Buoyancy Effects of MHD Flow for ITER SLL-TBM**
Meng, Z.; Zhou, T.; Zhang, H.; Chen, H. and FDS Team

P3-039 **Heat load test with the HCCR TBM first wall mock-up and the GAMMA-FR code validation**
Lee, E. H.; Jin, H. G.; Kim, S-K.; Yoon, J. S.; Lee, D. W.; Cho, S.

P3-040 **First-principles study of hydrogen adsorption and permeation in the reconstructed cubic erbium oxide surfaces**
Mao, W.; Chikada, T.; Shimura, K.; Suzuki, A.; Terai, T.

P3-041 **Visualization Experiment of Complex Flow Field in a Sphere-packed Pipe by Detailed PIV measurement**
Ebara, S.; Nematollahi, M. R.; Hashizume, H.

P3-042 **Rational of Helium Cooled Pebble Bed Blanket and R&D Activities**
Carloni, D.; Boccaccini, L. V.; Franza, F.; Kecskes, S.

P3-043 **Engineering analyses of ITER divertor Thomson scattering**
Nemov, A.; Modestov, V.; Borovkov, A.; Kochergin, M.; Mukhin, E.; Litvinov, A.; Koval, A.; Andrew, P.

P3-044 **Ceramic breeder for fusion nuclear reactors: thermo-mechanical tests on pebble beds**
Aquaro, D.; Lo Frano, R.; Baudanza, V.

P3-045 **Effect of Electromagnetic Coupling on MHD Flow in the Manifold of Fusion Liquid Metal Blanket**
Chen, H.; Zhou, T.; Zhang, H.; Meng, Z.; Wu, Y. and FDS Team

P3-046 **Progress on a coupled Systems Code-CFD MHD solver for fusion blanket design**
Wolfendale, M.

P3-047 **Design and Setup of a Testing Device to investigate a reduced sized attachment system mock up for the ITER EU HCPB-TBM under different mechanical loading conditions**
Zeile, C.; Maione, I. A.

P3-048 **Construction of PREMUX and preliminary experimental results, as preparation for the Helium Cooled Pebble Bed Breeder Unit mock-up testing**
Hernandez, F.; Kolb, M.; Annabattula, R.; Schlindwein, G.; Von der Weth, A.

P3-049 **Evaluation of hydrogen isotope absorption/diffusion coefficient of CVD-SiC in high temperature**
Yamamoto, Y.; Karasawa, T.; Takemoto, S.; Noborio, K.; Konishi, S.

P3-050 **Tritium management issues and anti-permeation strategies for different DEMO breeder blanket options**
Demange, D.; Boccaccini, L.; Franza, F.; Santucci, A.; Tosti, S.; Wagner, R.

P3-051 **Experimental study of instabilities in a quasi-2D MHD duct flow with near-wall jets**
Young, J.; Smolentsev, S.; Abdou, M.

P3-052 **Characterizing Pressure Equalization in MHD Flow in a Rectangular Duct with an Insulating Flow Channel Insert**
Sutevski, D.; Smolentsev, S.; Abdou, M.

P3-053 **Design and Construction of a Multipurpose Laboratory Scale Apparatus to Investigate Hydrogen Isotopes Behaviour In Pb15.7li and Permeation Technology**
Aiello, A.; Utili, M.; Storai, S.; Desideri, F.; Bettocchi, N.

P3-054 **Burnup analysis and fissile fuel breeding with a Uranium-Plutonium cycle in the molten salt blanket in a FFHR**
Zhao, J.; Yang, Y.; Xiao, S.; Zhou, Z.

P3-055 **Development of the breeding blanket and shield model for the fusion power reactors system SYCOMORE**
Li Puma, A.; Jaboulay, J. C.

P3-056 **Parametrical analysis of HCLL and HCPB TBM tritium transfer model with TMAP7**
Moreno, C.; Herrera, C.; Martínez, P. M.; Ibarra, A.

P3-057 **Development of an HCLL TBM Configuration And Ancillary Systems Dynamic Transfer Model with ECOSIMPRO®**
Serna, J.; Rueda, A.; Moreno, C.; Martínez, P. M.; Ricapito, I.; Calderoni, P.

P3-058 **Modelling a supercritical CO2 power cycle for nuclear fusion reactors using RELAP5-3D®**
Batet, L.; Alvarez Fernandez, J. M.; Mas de les Valls, E.; Perez, M.; Reventos, F.; Sedano, L. A.

P3-059 **Hydrogen solubility in liquid lithium-sodium alloy**
Yagi, J.; Tanaka, T.; Muroga, T.; Sagara, A.

P3-061 **Analysis of the thermo-mechanical behaviour of the DEMO Water-Cooled Lithium Lead breeding blanket module**
Chiovaro, P.; Di Maio, P. A.; Aiello, A.; Arena, P.; Bongiovì, G.; Giammmusso, R.; Li Puma, A.

Topic C Fuel Cycle and Tritium Processing

P3-062 **Alternative Analysis for Fuel Storage and Delivery in the ITER Tritium Plant**
Chang, M. H.; Yun, S-H.; Kang, H-G.; Cho, S.; Song, K-M.; Kim, D.; Chung, H.; Camp, P.; Willms, S.; Glugla, M.

P3-063 **Tritium Transport Modelling of Libretto-4 & 5 Transients**
Martínez, P.; Moreno, C.; Magielsen, L.; Ibarra, A.

P3-064 **Hydrogen extraction characteristics of high-temperature proton conductor ceramics for hydrogen isotopes purification and recovery**
Xia, T.; He, C.; Yang, H.; Zhao, W.; Yang, L.; Liu, Z.

P3-065 **Towards a physics-integrated view of the fusion fuel cycle**
Day, C.; Hauer, V.; Igitkhanov, J.; Kalupin, D.; Valovic, M.; Varoutis, S.

P3-066 **Research activities related to water detritiation at ICIT Rm. Valcea**
Zamfirache, M.; Bornea, A.; Stefanescu, I.; Varlam, C.; Bidica, N.

P3-067 **Tritium Removal Facility for processing of a large range tritiated water waste**
Bornea, A.; Zamfirache, M.; Stefanescu, I.; Stefan, L.

P3-068 **High gain and frequency ultra-stable integrators for long pulse applications**
Ziemba, T. M.; Miller, K. E.; Slobodov; I.; Prager, J.; Carscadden, J.

P3-069 **Research and Development of Online Tritium Monitoring Ionization Chamber**
Guangda,L.; Cheng, Q.; Deli, L.; Hongquan, T.; Changan, C.

P3-072 **Evaluation of tritium transport in nuclear fusion materials under irradiation at LIBRETTO-4**
Moral, N.; Martínez, P.; Sedano, L.; Álvarez, J.; Perlado, J. M.

P3-073 **Modelling of ITER divertor pumping system during various operational scenarios via kinetic theory**
Valougeorgis, D.; Misdanitis, S.

Topic D Material Engineering for FNT

P3-074 **Evaluation of applicability of a laser-based distance meter to measurement of Li jet thickness for the IFMIF/EVEDA project**
Kanemura, T.; Kondo, H.; Hoashi, E.; Yoshihashi-Suzuki, S.; Yamaoka, N.; Horiike, H.; Furukawa, T.; Hirakawa, Y.; Ida, M.; Wakai, E.

P3-075 **Mechanical Properties of Similar and Dissimilar Weldments of RAFM Steel and AISI 316L(N) Stainless Steel Prepared by Electron Beam Welding Process**
Albert, S.; Das, C. R.; Sam, S.; Mastanaiah, P.; Patil, M.; Bhaduri, A. K.; Jayakumar, T.; Murthy, C.V,S.; Ellappan, R. K.

P3-076 **Non-linear Failure Analysis of HCPB Blanket for DEMO Taking into Account High Dose Irradiation**
Aktaa, J.; Kecskés, S.; Pereslavtsev, P.; Fischer, U.; Boccaccini, L.

P3-077 **Study on Li diffusivity in lithium metatitanate with excess lithium (Li2+2xTiO3+y) at high temperature**
Mukai, K.; Omoto, K.; Yashima, M.; Sasaki, K.; Terai, T.; Suzuki, A.; Hoshino, T.

P3-078 **Compatibility of F82H exposed to liquid Pb-Li flow**
Kanai, A.; Park, C.; Noborio, K.; Kasada, R.; Konishi, S.; Hirose, T.; Nozawa, T.; Tanigawa, H.

P3-079 **Evaluation of multi-layered hardness in ion-irradiated stainless steel by nano-indentation technique**
Oka, H.; Sato, Y.; Hashimoto, N.; Ohnuki, S.

P3-080 **Manufacturing and oxidation behaviour of bulk self-passivating tungsten-based alloys**
García-Rosales, C.; López-Ruiz, P.; Álvarez-Martín, S.; Ordás, N.; Iturriza, I.; Koch, F.; Brinkmann, J.; Lindig, S.; Walter, M.

P3-081 **Swelling of SiC materials and its helium effects for expected operating conditions based on some blanket design using SiC materials**
Ozawa, K.; Nozawa, T.; Uto, H.; Someya, Y.; Tanigawa, H.; Tobita, K.

P3-082 **IFMIF-Test Facilities: Functional Analysis and Improvement of Hot Cells**
Mittwollen, M.; Eilert, D.; Kubaschewski, M.; Madzharov, V.; Arbeiter, F.; Tian, K.; Heinzel, V.

P3-084 **MYRRHA a Flexible And Fast Spectrum Irradiation Facility for Fusion Reactor Materials Testing**
Janssens, J.; Massaut, V.; Baeten, P.; Fernandez, R.

P3-085 **The development at a pilot plant scale and characterization of a reduced activation ferritic-martensitic steel for fusion applications, Asturfer®**
Morán De Vega, A.; Artímez, J. M.; Belzunce, J.

P3-086 **Diffusion bonding for 9Cr-ODS and JLF-1 Reduced Activation Ferritic/Martensitic Steels**
Fu, H.; Nagasaka, T.; Muroga, T.; Kimura, A.

P3-087 **Optical absorption defects created in SiO2 by O, Si and He ion irradiation**
Martin, P.; Jimenez-Rey, D.; Vila, R.; Sanchez, F.

P3-088 **CFD analysis on the effect of the flow straightener of IFMIF/EVEDA Lithium Test Loop**
Fujishiro, K.; Ida, M.; Tsuji, Y.; Wakai, E.; Groeschel, F.; Nishitani, T.

P3-089 **Joining Techniques for Reduced Activation 12Cr Steel for Laser Inertial Fusion Energy**
Hunt, R.; El-Dasher, B.; Choi, B.

P3-090 **Assessment of the beam-target interaction of IFMIF: a state of the art**
Knaster, J.; Groeschel, F.

P3-091 **Microstructure and deuterium permeation of alumina coatings on CLF-1 via MOCVD**
Li, S.; He, D.; Liu, X.; Zhang, C.; Yu, Q.; Wang, S.; Lei, Y.; Jiang, L.

Topic F Nuclear System Design

P3-092 **Investigation of the requirement for an energy storage system for DEMO and FPP**
Meszaros, B.; Kovari, M.; Jenkins, I.; Rendell, D.; Sanmartí, M.; Cruz, M.; Díaz, F.

P3-093 **Nuclear Analysis of the IFMIF European Lithium Target Assembly System**
Frisoni, M.; Bernardi, D.; Micciche, G.; Serra, M.

P3-094 **Benchmarking of MCNPX Results with Measured Tritium Production Rate and Neutron Flux at the Mock-Up of EU TBM (HCPB concept)**
Tore, C.; Ortego, P.

P3-095 **Start-Up and Shutdown Thermomechanical Transient Analyses of the IFMIF European Lithium Target System**
Bernardi, D.; Arena, P.; Bongiovì, G.; Di Maio, P. A.; Frisoni, M.; Miccichè, G.; Serra, M.

P3-097 **Challenges and Progress in the Design of ITER Tokamak Cooling Water System Inside Cryostat**
Dell'Orco, G.; Berruyer, F.; Gopalapilla, B.; Li, F.; Kuehn, I.; Mazzei, M.; Ployhar, S.; Reich, J.; Risnoveanu, A.; Somboli, F.; Teodoros, L.; Chang, K-P.

P3-098 **Detailed 3-D Nuclear Analysis of ITER Blanket Modules for Final Design Review**
Bohm, T.; Sawan, M.; Marriott, E.; Wilson, P.; Ulrickson, M.; Bullock, J.

P3-100 **Analysis of radiation environment at divertor in helical DEMO reactor FFHR-d1**
Tanaka, T.; Sagara, A.; Masuzaki, S.; Tokitani, M.; Muroga, T.; Miyazawa, J.; Goto, T.; Tamura, H.

P3-101 **Novel Hybrid Monte Carlo/Deterministic Technique for Shutdown Dose Rate Analysis**
Ibrahim, A.; Peplow, D.; Grove, R.; Wilson, P.

P3-102 **Primary Design of EAST RMP Coils**
Ji, X.; Wang, S.; Song, Y.

P3-103 **Nuclear Analysis of the Diagnostics Equatorial Port Plug #3 In ITER with Attila Code and Impact on Interspace Dose Rates**
Youssef, M.; Feder, R.

P3-104 **Design and Configuration Management Platform for Fusion Components**
Benoît, F.; Allegretti, L.; Bucalossi, J.; Doceul, L.; Faïsse, F.; Firdaouss, M.; Geynet, M.; Magaud, P.; Missirlian, M.; Van Houtte, D.; Aumeunier, M-H.; Robert, J.

Topic G Safety Issues and Waste Management

P3-105 **IFMIF Accelerator Facility Safety Analysis Based on FMECA Methodology**
Díaz-Arocas, P.; Mora, J. C.; Pérez, D.; Ogando, F.; Verschueren, D.

P3-106 **Free License codes to simulate the diffusion of contaminants in case of radiological release**
Gaudio, P.; Gelfusa, M.; Lupelli, I.; Malizia, A.; Antonelli, L.; Carestia, M. C.; Conetta, F.; Peluso, E.; Barlascini, O.; Fiorini, E.; Latini, G.; Soave, P. M.; Richetta, M.

P3-107 **Dust tracking techniques applied at STARDUST facility: first results**
Malizia, A.; Camplani, M.; Gelfusa, M.; Lupelli, I.; Richetta, M.; Antonelli, L.; Conetta, F.; Scarpellini, D.; Carestia, M.; Peluso, E.; Bellecci, C.; Salgado, L. and Gaudio, P.

P3-108 **Neutronics analysis and dose reduction for the ITER Neutral Beam Cell**
Lilley, S.; Delmas, E.; Lis, M.; Eade, T.; Loughlin, M.

P3-109 **Numerical Study of Air Jet Flow Field During a Loss of Vacuum Accident inside STARDUST facility**
Lupelli, I.; Gaudio, P.; Gelfusa, M.; Malizia, A.; Belluzzo, I.; Richetta, M.

P3-110 **Study of safety features and accident scenarios in a fusion DEMO reactor**
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