

SOFE-2013 Program

Revised 10 June 2013

Tuesday Morning, June 11, 2013

Session TPL: Plenary I

Tuesday, June 11 08:30-10:30, Stanford E+W

Session Chair: Jean Paul Allain, Purdue University
Chair, IEEE Fusion Technology Committee

8:30 TPL-1 Welcome and Introduction

W. Meier¹, H. Neilson²

¹Lawrence Livermore National Laboratory, Livermore, CA, United States

²Princeton Plasma Physics Laboratory, Princeton, NJ, United States

9:00 TPL-2 (invited) ITER Engineering Integration Challenges

R. Haange

ITER Organization, St Paul lez Durance, France

9:45 TPL-3 (invited) The European Fusion Roadmap

F. Romanelli

EFDA-CSU, Culham Science Centre, Abingdon, OX14 3DB, UK, Abingdon, United Kingdom

Session TO1: Experimental Devices I

Tuesday, June 11 11:00-12:30, Stanford E

Session Chair: Alan Sykes, Tokamak Solutions UK

11:00 TO1-1 (invited) NSTX Accomplishments and NSTX Upgrade Research Plans in Support of Fusion Next-Steps

J. Menard¹, J. Bialek², J. Canik³, J. Chrzanowski¹, D. Gates¹, S. Gerhardt¹, W. Guttenfelder¹, S. Kaye¹, E. Kolemen¹, R. Maingi¹, M. Mardenfeld¹, D. Mueller¹, C. Neumeyer¹, M. Ono¹, E. Perry¹, S. Raftopoulos¹, R. Ramakrishnan¹, R. Raman⁴, Y. Ren¹, S. Sabbagh², V. Soukhanovskii⁵, T. Stevenson¹, R. Strykowski¹, P. Titus¹, K. Tresemer¹, H. Zhang¹, Y. Zhai¹, A. Zolfaghari¹

¹Princeton Plasma Physics Laboratory, Princeton, NJ, United States

²Columbia University, New York, NY, United States

³Oak Ridge National Laboratory, Oak Ridge, TN, United States

⁴University of Washington, Seattle, WA, United States

⁵Lawrence Livermore National Laboratory, Livermore, CA, United States

11:20 TO1-2 (invited) MAST Accomplishments/Plans in Support of Fusion Next-Steps

W. Morris for the MAST and MAST-U teams

EURATOM/CCFE Fusion Association, Abingdon, United Kingdom

11:40 TO1-3 MAST Upgrade - Progress and Engineering Challenges

J. Milnes for the MAST-U team

Central Engineering Department, EURATOM/CCFE Fusion Association, Culham, Oxfordshire, United Kingdom

11:55 TO1-4 (invited) EAST Accomplishments/Plans in Support of Fusion Next-Steps

Y. T. Song, J. G. Li, Y. X. Wan, P. Fu

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

12:15 TO1-5 Preparation of the Wendelstein 7-X Commissioning

H. -S. Bosch, R. Brakel, M. Gasparotto, R. Herrmann, D. Hartmann, D. Naujoks

Max-Planck-Institut für Plasmaphysik, Greifswald, Germany

Session TO2: Magnets I

Tuesday, June 11 11:00-12:30, Stanford W

Session Chair: Peter Titus, Princeton Plasma Physics Laboratory

11:00 TO2-1 (invited) Design and Manufacturing Studies for ITER in-Vessel Coils

M. Kalish¹, E. Daly², A. Loarte², A. Martin², C. Sborchia², A. Brooks¹, P. Heitzenroeder¹, C. - H. Choi², C. Neumeyer¹, P. Titus¹, Y. Zhai¹, Y. Wu³, J. Huan³, L. Feng³, Y. -T. Song³, Z. Wang³, R. Pillsbury⁴, J. Feng⁵, T. Bohm⁶, M. Sawan⁶, J. Jiang⁷, J. Hsiao⁸, M. Messineo¹, M. Gomez¹, C. Hause¹

¹PPPL, Princeton NJ, USA

²ITER Organization, St Paul-lez-Durance, France

³ASIPP, Hefei, China

⁴Sherbrooke Consulting, Arlington VA, USA

⁵MIT PFSC, Cambridge MA, USA

⁶UW Fusion Technology Institute, Madison WI, USA

⁷SWIP, Chengdu, China

⁸Vector Resources, Cambridge MA, USA

11:20 TO2-2 (invited) ITER Central Solenoid Design

D. A. Everitt

U.S. ITER Project Office, Oak Ridge National Laboratory, Oak Ridge, TN, United States

11:40 TO2-3 (invited) ITER Central Solenoid Module Fabrication

J. P. Smith¹, J. Blanchard¹, A. Gattuso¹, R. Haefelfinger¹, R. Junge¹, K. Schaubel¹, J. Spitzer¹, W. Reiersen²

¹General Atomics, San Diego, CA, United States

²Princeton Plasma Physics Laboratory, Princeton, NJ, United States

12:00 TO2-4 The Current Leads of the Wendelstein 7-X Superconducting Magnet System

T. Rummel¹, T. Moennich¹, K. -P. Buscher¹, F. Schauer¹, W. H. Fietz², R. Heller²

¹Max Planck Institute for Plasma Physics, Greifswald, Germany

²Karlsruhe Institute of Technology, Karlsruhe, Germany

12:15 TO2-5 (invited) NSTX-Upgrade Magnet Design and Fabrication

S. Raftopoulos, M. Anderson, J. Chrzanowski, L. Dudek, R. Hatcher, P. Heitzenroeder, S. Jurczynski, E. Kearns, M. Madenfeld, T. Meighan, C. Neumeyer, H. Schneider, P. Titus, T. Willard, H. Zhang, A. Zolfighari

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

Session TO3: MFE Fueling, Exhaust, and Vacuum Systems

Tuesday, June 11 11:00-12:45, Gold Suite

Session Chair: Irving Zatz, Princeton Plasma Physics Laboratory

11:00 TO3-1 (invited) A Review of Pellet Injection Technology and Applications

S. K. Combs

Fusion Energy Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States

11:20 TO3-2 (invited) Exhaust Pumping of DT Fusion Devices: Current State-of-the-Art and a Potential Roadmap to a Power Plant

C. Day

Dept. ITEP-VAC, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

11:40 TO3-3 (invited) Magnetic Fusion Applications and Experimental Results Using Cryogenic Pellet Injection

L. R. Baylor

ORNL, Oak Ridge, TN, United States

12:00 TO3-4 The THESEUS Facility - A Test Environment for the Torus Exhaust Vacuum Pumping System of a Fusion Power Plant

T. Giegerich, C. Day

Institute for Technical Physics, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

Paper TO3-5 Withdrawn

12:15 TO3-6 A Computational Study of Lithium Solid Propellants for Magnetic Confinement Fusion Fueling

T. E. Gebhart, A. L. Winfrey

Nuclear Engineering Program, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States

Tuesday Afternoon, June 11, 2013

Session TPO: Poster I

Poster Session

Tuesday, June 11 14:00-16:00, Stanford E+W

Session Chairs: Ninaad Desai, Princeton Plasma Physics Laboratory
Michael Kalish, Princeton Plasma Physics Laboratory

TPO-1 TBR and Shielding Analyses in Support of ST-FNSF Study

L. A. El-Guebaly¹, L. Mynsberge¹, A. Jaber¹, J. Menard², T. Brown²

¹*University of Wisconsin, Madison, WI, United States*

²*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

TPO-2 Progress in Developing the ST-FNSF Configuration

T. G. Brown¹, J. Menard¹, P. Titus¹, A. Zolfaghari¹, L. El-Guebaly², L. Mynsberge²

¹*Princeton University, Princeton, NJ, United States*

²*University of Wisconsin, Madison, WI, United States*

TPO-3 ST-FNSF Mission and Performance Dependence on Device Size

J. Menard¹, T. Brown¹, J. Canik², L. El-Guebaly³, S. Gerhardt¹, A. Jaber³, S. Kaye¹, E. Meier⁴,
L. Mynsberge³, C. Neumeyer¹, M. Ono¹, R. Raman⁵, S. Sabbagh⁶, V. Soukhanovskii⁴, P. Titus¹,
G. Voss⁷, R. Woolley¹, A. Zolfaghari¹

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⁵*University of Washington, Seattle, WA, United States*

⁶*Columbia University, New York, NY, United States*

⁷*Culham Centre for Fusion Energy, Abingdon, Oxfordshire, United Kingdom*

TPO-4 Design Description of the Coaxial Helicity Injection System on NSTX-U

R. Raman¹, T. R. Jarboe¹, B. A. Nelson¹, D. Mueller², S. C. Jardin², C. Neumeyer², M. Ono²,
J. E. Menard²

¹*Aeronautics and Astronautics, University of Washington, Seattle, United States*

²*Princeton Plasma Physics Laboratory, Princeton, United States*

TPO-5 Power and Particle Exhaust in an ST-FNSF

J. Canik¹, T. Gray¹, R. Maingi², J. Menard²

¹*ORNL, Oak Ridge, TN, United States*

²*PPPL, Princeton, NJ, United States*

Paper TPO-6 Withdrawn

TPO-7 Preliminary Consideration on a Copper-Coil Fusion Test Reactor

G. Zheng

Southwestern Institute of Physics, Chengdu, China

TPO-8 Progress in Developing the K-Demo Device Configuration

T. G. Brown¹, G. H. Neilson¹, C. Kessel¹, P. Titus¹, K. Kim², C. Kim², S. Oh², Y. S. Lee²,
J. H. Yeom², K. Im², G. -S. Lee², S. Baik²

¹*Princeton University, Princeton, NJ, United States*

²*National Fusion Research Institute, Gwahak-ro, Daejeon, Republic of Korea*

TPO-9 Balance of Plant Challenges for a Near-Term EU Demonstration Power Plant

M. Porton¹, H. Latham², E. Surrey¹, T. Todd¹, Z. Vizvary¹

¹*Culham Centre for Fusion Energy, Abingdon, United Kingdom*

²*Rolls Royce, Derby, United Kingdom*

TPO-10 Facilities for Quasi-Axisymmetric Stellarator Research

G. H. Neilson, D. A. Gates, A. Cohen, P. H. Heitzenroeder, M. D. Williams, M. C. Zarnstorff
Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-11 Concept Design of CFETR Tokamak Machine

Y. T. Song¹, S. T. Wu^{1,2}, J. G. Li^{1,2}, B. N. Wan¹, Y. X. Wan^{1,2}, P. Fu¹, M. Y. Ye², S. M. Liu¹,
X. Gao^{1,2}

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TPO-12 Economic Analysis of Super-Conductor and Copper Design of China Fusion Engineering Test Reactor

J. Jiang¹, Y. Wu^{1,2}, Y. Hou¹, D. Chen¹, W. Duan¹, H. Du¹, H. Wang¹, L. Sun¹, M. Ni^{1,2},
Q. Zeng^{1,2}

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²*University of Science and Technology of China, Hefei, Anhui, China*

TPO-13 Engineering Design and Steady State Thermomechanical Analysis of the IFMIF European Lithium Target System

D. Bernardi¹, P. Arena², G. Bongiovi², P. A. Di Maio², M. Frisoni³, G. Micciche¹, M. Serra¹

¹*ENEA C.R. Brasimone, Camugnano (BO), Italy*

²*Dipartimento di Energia, Ingegneria dell'Informazione e Modelli Matematici, Universita' di Palermo, Palermo, Italy*

³*ENEA C.R. Bologna, Bologna, Italy*

TPO-14 Application of Accelerator Based Neutron Sources in Materials Research

E. Surrey, M. Porton

Technology & Future Projects, Culham Centre for Fusion Energy, Abingdon, United Kingdom

TPO-15 Optimization of the Snowflake Diverted Equilibria in CFETR

Z. Luo¹, B. Xiao^{1,2}, Y. Guo¹, M. Ye²

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²*School of Nuclear Science and Technology, University of Science and Technology of China, Hefei, China*

TPO-16 Scoping Studies for NBI Launch Geometry on DEMO

I. Jenkins, D. L. Keeling, E. Surrey

Technology and Future Projects, CCFE, Abingdon, OX14 3DB, United Kingdom

TPO-17 Design Integrated System for Power Plant Development

H. Neuberger, F. Franza, I. A. Maione, S. Kecskes, L. V. Boccaccini

Institute for Neutron Physics and Reactor Technology, Karlsruhe Institute of Technology, Karlsruhe, Germany

TPO-18 Plasma Performance Required for Fusion Power Control Considering Grid Operation in Demo-CREST

R. Hiwatari, K. Okano

Central Research Institute of Electric Power Industry, Komae, Tokyo, Japan

TPO-19 Optimization of Fusion-Fission Hybrid Reactor Fuel Composition

M. L. Perez-Gamboa^{1,2}, M. Nieto-Perez², S. Mahajan³, P. Valanju³

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²*CICATA Queretaro, IPN, Queretaro, Mexico*

³*Institute for Fusion Studies, University of Texas, Austin, TX, USA*

TPO-20 New Progress on Design and R&D of the Solid Breeder Test Blanket Module in China

K. M. Feng, G. S. Zhang, Z. Zhao, Y. J. Fewng, Z. X. Li, X. F. Ye, P. H. Wang, L. Zhang, B. Xiang, Q. J. Wang, Q. X. Chao, F. C. Zhao, F. Wang, Y. Liu

Fusion Reactor Design and Materials, Southwestern Institute of Physics, Chengdu, China

TPO-21 A Global Mechanical Analysis and Optimization of Vacuum Vessel and Attached Structure of KTX Device

S. Shi¹ (presented by J. Zheng), Y. Song¹, Q. Yang¹, Z. Wang¹, W. Liu², W. Ding², S. Wan², J. Zhang¹, H. Xu¹

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²*School of Physical Sciences, University of Science and Technology of China, Hefei, Anhui, China*

TPO-22 A Preliminary Concept Design Study of Blanket for Korean Demo Reactor (K-DEMO)

Y. S. Lee, S. H. Baek, K. Im, J. H. Yeom, H. C. Kim, K. Kim

Advanced Project Division, National Fusion Research Institute, Daejeon, South Korea

TPO-23 Design and Manufacture of the ITER Cryostat

B. R. Doshi

ITER Organization, Saint Paul Lez Durance, France

TPO-24 Benchmark Calculations for the Starter Fendl-3.0 General Purpose Neutron Library with Impact on ITER Analysis

M. E. Sawan¹, B. J. Walker²

¹*Engineering Physics, University of Wisconsin-Madison, Madison, WI, United States*

²*Medical Physics, University of Wisconsin-Madison, Madison, WI, United States*

TPO-25 Numerical Analysis Two-Phase Flow and Heat Transfer of Fuel Particles and Liquid Metal for Waste Transmutation Blanket

W. Wang

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

TPO-26 Performance of Beryllium Pebbles Using Rotating Electrode Process

Y. Feng¹, K. Feng¹, Y. Cheng¹, Y. Liu¹, J. Zhang²

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²*Baoji Haibao Special Metal Materials Co. Ltd., Baoji, China*

TPO-27 Numerical Analysis of Coupling MHD Rectangular Duct Flows

X. Zhang

SWIP, Chengdu, China

TPO-28 A Multi-Layer Breeding Blanket Concept for CFETR Based on PWR Water Condition

C. Liu, D. Yao, X. Gao, Z. Wang, S. Liu

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TPO-29 Assessment of Commercially Available Sensors for Application to Test Blanket Systems Instrumentation

P. Calderoni, M. Zmitko, I. Ricipito

ITER Department, Fusion for Energy, Barcelona, Spain

TPO-30 Analysis of LiPb Slug Flow Inside Channel with Thin Wall in the SLL Blanket

H. Wang

School of Energy and Power Engineering, Nanjing Institute of Technology, Nanjing, China

TPO-31 Flow Distribution Systems for Liquid Metal Cooled Blankets

C. Koehly¹, M. Tillack², S. Malang³

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TPO-32 Structural Analysis of the ITER Thermal Shield

C. H. Noh¹, K. Nam¹, W. Chung¹, D. K. Kang¹, K. O. Kang¹, H. J. Ahn¹, N. I. Her², C. Hamlyn-Harris²

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TPO-33 Functional Components Design and Analysis of a Korean HCCR TBM in ITER

D. W. Lee¹, H. G. Jin¹, K. I. Shin¹, E. H. Lee¹, S. -K. Kim¹, J. S. Yoon¹, M. -Y. Ahn², S. Cho²

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TPO-34 Characterization of Precipitates in CLAM Steel with Atom Probe Tomography

K. Li^{1,2}, G. Xu², S. Liu², Q. Huang^{2,1}

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TPO-35 Tensile and Impact Properties of CLAM Steel as ITER-China-TBM Candidate Structural Material after 1.25 dpa Neutron Irradiation

L. Peng^{1,2}, H. Ge^{1,2}, S. Jiang², J. Xin², C. Li², Q. Huang^{2,1}, Y. Wu^{2,1}

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TPO-36 Structural Analysis Work on ITER Vacuum Vessel

C. H. Jun¹, J. -M. Martinez¹, A. Alekseev¹, C. Sborchia¹, K. Ioki¹, C. Choi¹, B. Giraud¹, Y. Utin¹, E. Daly¹, X. Wang¹, R. Lebarbier¹, A. Bayon², J. Caixas², H. -J. Ahn³, H. -S. Kim³

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TPO-37 Applications of MCCAD for the Automatic Generation of MCNP 3D Models in Fusion Neutronics

F. Moro¹, U. Fischer², L. Lu², P. Pereslavitsev², S. Podda¹, R. Villari¹

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TPO-38 THE ITER EC-H&CD Upper Launcher: FEM Analyses of the Blanket Shield Module with Respect to Surface and Nuclear Heat Loads

A. Vaccaro¹, G. Aiello¹, G. Grossetti¹, A. Meier¹, T. A. Scherer¹, S. Schreck¹, P. SpÄh¹, D. StrauÄ¹, A. Serikov², B. Weinhorst²

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TPO-39 Considerations of Transient Electromagnetic Forces in Structural Behaviors for ITER Shield Blanket Components

A. Y. Ying¹, J. Kotulski², H. Zhang¹, M. Ulrickson²

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TPO-40 Structural Design Analysis Considering Contact Stress between KO HCCR TBM Sub-Modules for ITER

K. I. Shin¹, D. Y. Ku², D. W. Lee¹, H. G. Jin¹, E. H. Lee¹, S. -K. Kim¹, J. S. Yoon¹, M. -Y. Ahn², S. Cho²

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TPO-41 Analysis of Flow Distribution and Pressure Drop in a Regular Sector of the ITER Vacuum Vessel

L. Savoldi Richard¹, S. Corpino², J. Izquierdo³, R. Le Barbier⁴, G. Obiols-Rabasa², Y. Utin⁴, R. Zanino¹

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TPO-42 Thermal-Hydraulic Effects of the Nuclear Heat Load on a Regular Sector of the ITER Vacuum Vessel

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TPO-43 Further Experimental Validation of Continuum FEM Simulation for Ceramic Breeder Pebble Bed Units

J. Tucker, A. Ying, M. Abdou

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TPO-44 Influence of Magnetic Field on the Corrosion of Clam and 316L Steel in Flowing PbLi

Q. Huang^{1,2}, J. Liu^{1,2}, Z. Zhu¹, B. Qu¹, Y. Wu¹

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Paper TPO-45 Withdrawn

TPO-46 Error Evaluation in Hydrogen Isotope Permeability Measurement of Silicon-Carbide and the Required Degree of Vacuum

Y. Yamamoto¹, S. Takemoto¹, Y. Murakami¹, D. Yonetsu¹, K. Noborio², S. Konishi²

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TPO-47 Final Design and Start of Manufacture of the ITER Vacuum Vessel Ports

Y. Utin¹, A. Alekseev¹, C. Sborchia¹, C. Choi¹, V. Barabash¹, B. Giraud¹, C. Jun¹, K. Ioki¹, R. Le Barbier¹, B. Levesy¹, J. -M. Martinez¹, J. Sa¹, X. Wang¹, H. Ahn², H. Kim², C. Park², S. Fabritsiev³, E. Kuzmin³, E. Privalova³

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TPO-48 Impact of Pulsed Operation on Lifetime of Demo Blanket

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TPO-49 Parametric Analysis of EM Loads Acting on Demo Vertical Segments with Respect to Module's Dimension

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TPO-50 Resonance of the ITER Diagnostic Upper Port Plug with EM Loads During a Plasma Disruption

S. Pak¹, V. Udintsev², P. Maquet², M. S. Cheon¹, C. R. Seon¹, H. G. Lee¹

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TPO-51 Influence of Uninsulated Gaps Between Flow Channel Inserts in Ducts of DCLL Blankets

L. Bühler, C. Mistrangelo

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TPO-52 Influence of Variable Heat Source on Magneto Convective Flows in HCLL Blankets

C. Mistrangelo, L. Bühler

Karlsruhe Institute of Technology, Karlsruhe, Germany

TPO-53 Novel Use of Water Soluble Aquapour as Temporary Spacer During Coil Winding for the NSTX-U Centerstack

M. Mardenfeld, J. Chrzanowski, M. Anderson, E. Kearns, C. McFarlane, S. Raftopoulos, W. Reese, R. Tucker

Princeton Plasma Physics Laboratory, Princeton, United States

TPO-54 Mechanical Analysis for ITER Upper ELM Coil

S. Zhang, Y. Song, Z. Wang, S. Du, X. Ji

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TPO-55 Thermal and Hydraulic Analysis of ITER Upper VS Coil

H. Yang, Z. W. Wang, Y. T. Song

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

TPO-56 Conceptual Design and Analysis of CFETR Magnets

X. Liu, J. Zheng, Z. Luo, S. Du, S. Liu, Y. Song

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TPO-57 Finite Element Analysis of Springback in Roll-Bend Forming for CICC

X. Ni, Y. Song, Z. Wang

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China

TPO-58 Solder Development and Fabrication Techniques for Coolant Tube Bonding in Toroidal Field Conductors for the National Spherical Torus Experiment Center Stack Upgrade

S. Z. Jurczynski, M. L. Anderson, J. E. Benchoff, H. Schneider, D. M. Westover, W. W. White

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-59 Electromagnetic Loads Prediction and Structural Analysis of HL-2M Toroidal Field Coils

L. Cai, D. Liu, H. Zou, J. Liu, G. Li, X. Li

Southwestern Institute of Physics, Chengdu, China

TPO-60 Mechanical Design of the Central Solenoid Assembly for the JT-60SA Tokamak

K. Tsuchiya, K. Kizu, H. Murakami, N. Yoshizawa, Y. Koide, K. Yoshida

Naka, Japan Atomic Energy Agency, Naka, Ibaraki, Japan

TPO-61 The Tolerance Analysis for ITER Feeder CTB&SBB Components

S. Liu^{1,2}, X. Kong¹, Y. Chen¹, K. Lu², Y. Song², Y. Chen³, C. Gong³

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TPO-62 Concept Design of Hybrid Superconducting Magnet for CFETR Tokamak Reactor

J. X. Zheng¹, Y. T. Song^{1,2}, X. F. Liu¹, J. G. Li^{1,2}, Y. X. Wan^{1,2}, S. T. Wu^{1,2}, K. Lu¹

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TPO-63 Development of a Process to Build Polyimide Insulated Magnets for Operation at 350 C

I. J. Zatz, S. Z. Jurczynski

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-64 Experiences from the Installation of the Superconducting Bus Bar System of Wendelstein 7-X

K. Rummel¹, A. John², L. Hajduk³

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TPO-65 Electromagnetic and Structural Analyses of the ITER Central Solenoid Feeder Structures

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TPO-66 Thermal Analysis of the ITER TF Feeder Cryogenic Components

Z. W. Wang¹, Y. T. Song¹, S. H. Huang²

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TPO-67 Design and Analysis of the ITER TF Feeder Dry Box

G. Shen, Y. T. Song, Z. W. Wang

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TPO-68 Axisymmetric Simulations of the ITER Vertical Stability Coil

P. H. Titus, H. Zhang, M. Kalish

Mechanical Engineering Division, Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-69 A Preliminary Conceptual Design Study for Korean Fusion Demo Reactor Magnets

K. Kim¹, S. Oh¹, S. H. Baek¹, P. Titus², T. Brown², C. Kessel², Y. Zhai²

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²*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*

TPO-70 Preliminary Analysis of the Heat Load of CFETR Superconducting Magnet

J. Li¹, Y. Bi¹, P. Weng¹, Q. Wang², L. Qiu¹, X. Liu¹, Y. Ren¹, X. Gao¹

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TPO-71 Reduction of Eddy Currents Induced by Resonant Magnetic Perturbation Coils by Inserting High Permeability Materials

H. Jin, Y. Ding, B. Rao, B. Yi, N. Wang, M. Zheng, Q. Li, S. Xie, G. Zhuang, Y. Pan

Huazhong University of Science and Technology, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Wuhan, China

TPO-72 W7-X Trim Coils - Component Safety Aspects and Commissioning Strategy

K. Risse¹, S. Freundt¹, F. Fuellenbach¹, M. Koeppen¹, T. Rummel¹, R. Hatcher², S. Langisch², M. Mardenfeld², G. H. Neilson², X. Zhao²

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TPO-73 Manufacturing of the First Toroidal Field Coil for the JT-60SA Magnet System

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³*JT-60SA European Home Team, Garching, Munich, Germany*

TPO-74 Identifying the Cause of the NSTX TF Coil Bundle Failure

L. E. Dudek, J. H. Chrzanowski, P. Heitzenroeder, T. Meighan, S. Ramakrishnan,

M. D. Williams

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-76 THERMAL AND STRUCTURAL ANALYSIS OF THE ITER ELM COILS

A. W. Brooks, Y. Zhai

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TPO-77 Efficient Ignition of Fusion Using PW-Ps Laser Pulses for Ultrahigh Acceleration of Plasma Blocks

H. Hora¹, George H. Miley²

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²*University of Illinois, Urbana, IL, United States*

TPO-78 Problems and Solutions of Radiation Damage in Final Optics of Laser Fusion Systems

D. Garoz Gomez¹, R. Juarez^{1,2}, R. Gonzalez-Arrabal¹, J. Alvarez¹, J. Sanz^{1,2}, J. M. Perlado¹, A. Rivera¹

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²*Departamento de Ingenieria Energetica (UNED), Madrid, Spain*

ThPO-90 The Application of Mid-Range Control to Improve Thermal Disturbance Rejection for Cryogenic THD/DT Layering at the National Ignition Facility

M. S. Dayton, B. J. Haid

National Ignition Facility/Control Systems Engineering, Lawrence Livermore National Laboratory, Livermore, CA, United States

TPO-79 Petawatt Laser Driven Cluster Foils for an Intense Pulsed Neutron Source

G. H. Miley

NPL Associates, Inc., Champaign, IL, United States

WO2-6 Bulk Modulus for Solid Molecular Tritium: Ab Initio Approximation

C. L. Guerrero Contreras (presented by Nuria Moral), J. M. Perlado Martin

Instituto de Fusion Nuclear, Universidad Politecnica de Madrid, Madrid, Spain

TPO-80 Design Progress of Plasma and Outer Vessel Exhaust Gas System Based on LOCA Safety Analysis of W7-X Stellarator

D. D. I. Chauvin¹, D. D. Naujoks², B. D. I. Missal², T. D. I. Kobarg², F. Starke², L. D. I. Topilski³, E. D. Urbonavičius⁴

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TPO-81 Preliminary Results of Glow Discharge Cleaning Test on SWIP Test Bench

Y. Wang, M. Wang, M. Dan, X. Ren, Y. Pan, D. Wang, L. Shen, B. Li

Southwestern Institute of Physics, Chengdu, China

TPO-82 A State Machine Approach to ITER Vacuum Systems Operation and Controls

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²*TATA Consultancy Services, Maharashtra, India*

Paper TPO-83 Withdrawn

Paper TPO-84 Withdrawn

TPO-85 A R&D Program on Leak Localization Concepts for Actively Cooled Fusion Machines

A. Durocher¹, V. Bruno¹, M. Chantant¹, L. Gargiulo¹, J. -C. Hatchressian¹, M. Houry¹,
D. Mouyon¹, D. Anthoine²

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²*Bertin Technologies, Aix-en-Provence, France*

TPO-86 Upgrades to the Alcator C-Mod Gas System

R. Tesfaye, W. M. Burke, G. L. Dekow, T. L. Toland

Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States

TPO-87 Experimental Validation of a Molecular Flow Code with the ARIANNA Setup

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TPO-88 Re-Assessment of Tritium Self-Sufficiency for Fusion Reactor

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TPO-89 Development of a Flange Type Hydrogen Permeation Sensor for Liquid Breeders

E. H. Lee¹, B. G. Choi¹, S. -K. Kim¹, J. S. Yoon¹, D. W. Lee¹, S. Cho²

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TPO-90 Hydrogen Isotopes and Helium Diffusion Challenges on Future Nuclear Fusion Reactors

N. Moral, D. Garoz, O. Gonzalez-del Moral, J. Alvarez, J. M. Perlado

Instituto de Fusion Nuclear, Madrid, Spain

TPO-91 Liquid Lithium for the Purpose of Attenuating Tritium Inventory Levels in Fusion Energy Reactors

C. A. Gentile, R. D. Woolley, L. E. Zakharov

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Paper TPO-92 Withdrawn

TPO-93 Impact of Tritium Solubility in Liquid Pb-Li on Tritium Migration in HCLL and Well Blankets

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TPO-94 Operation Scenario of DT Fusion Plant Without External Initial Tritium

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²*Institute of Advanced Energy, Kyoto University, Kyoto, Japan*

TPO-95 Hydrogen Solubility and Electrical Resistivity Measurements of Hydrogenated Pb-Li

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TPO-97 Research of the Soft Start Circuit for the High Voltage Power Supply Based on Psm Technology

L. Xia, M. Zhang, S. Ma, K. Yu

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TPO-98 Hardwired Control System Changes for NSTX DC Power Feeds

S. Ramakrishnan, X. Zhao, C. Neumeyer, J. Lawson, R. Hatcher, R. Mozulay, E. Baker, W. Que
Engineering, Princeton Plasma Physics Laboratory, Princeton, NJ, United States

TPO-99 Power Supply Changes for NSTX Resistive Wall Mode Coils

S. Ramakrishnan, C. Neumeyer, R. Mozulay, J. Lawson, R. Hatcher, E. Baker, X. Zhao
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TPO-100 Initial Integration of “Regulated High Voltage Power Supply” (RHVPS) with LHCD System of SST-1

P. J. Patel¹, C. B. Sumod¹, D. P. Thakkar¹, L. N. Gupta¹, V. B. Patel¹, V. B. Vadher¹,
L. K. Bansal¹, K. Qureshi¹, U. K. Baruah¹, N. Rajanbabu², S. Dalkoti², C. G. Virani²,
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TPO-101 Development and Aging Tests of High Current Busbar Contacts for the ITER Coil Power Supply System

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TPO-102 ITER Electrical Distribution System

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TPO-103 A Pulse Step Modulator Cathode Power Supply for ECRH System on HL-2a Tokamak

X. Mao, L. Yao, Y. Wang, Y. Wang, Q. Li

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TPO-104 High-Voltage Power Supply for ECRH System on J-TEXT Tokamak

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Paper TPO-105 Withdrawn

Paper TPO-106 Withdrawn

TPO-107 Generation of High Power Pulse Series Based on Resistive Loads

O. G. Egorov

Atomic energy, TRINITI, Moscow, Troitsk, Russian Federation

TPO-108 Pulsed-Inductive-Plasma Thruster

F. J. Wessel, N. Bolte, V. Kiyashko, M. Morehouse, T. Roche, M. Slepchenkov

Experimental Physics, Tri Alpha Energy, Inc., Foothill Ranch, CA, United States

TPO-109 EBW technology applied on the ICRF Antenna Component

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TPO-110 The Design and R&D Work of EAST Tungsten Divertor

Z. Zhou, D. Yao

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TPO-111 ITER HTS-CL Superconducting Linker Preparation and Its Vacuum Soldering

Q. Ran

Institute of Plasma Physics, Chinese Academy of Sciences, Hefei 230031, China, Hefei, Anhui, China

TPO-112 DEVELOPMENT OF ITER INTERCOIL STRUCTURES ASSEMBLY TOOLS FOR TFC LINKAGE AND THEIR MOCK-UPS

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TPO-113 The Construction Progress of HL-2M Tokamak

Q. Li

Southwestern Institute of Physics, Chengdu, China

TPO-114 DEMO: Heating and Current Drive System Integration with Blanket System

G. Grossetti¹, J. Harman², M. Mittwollen³, E. Poli⁴, T. Scherer¹, P. Spaeh¹, D. Strauß¹,
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TPO-115 New Design of the Support Leg for the ITER Transfer Cask System

S. Li (presented by G. Li)

Department of Mechanical & Electrical Engineering, Anhui University of Architecture, Hefei Anhui, China

TPO-116 Structure Design and Test Research on the Electrical Properties of High Voltage Instrumentation Cables for the Fusion Reactor

Q. Gao¹, X. Huang¹, W. Xi¹, F. Rodriguez-Mateos²

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Paper TPO-117 Withdrawn

TPO-118 Early Design Verification of ITER Remote Handling Systems Using Digital Mock-Ups

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²*Intelligent Hydraulics and Automation, Tampere University of Technology, Tampere, Finland*

TPO-119 Design, Manufacturing and Testing of a Fast Disconnecting System for the European Target Assembly Concept of IFMIF

G. Micciché¹, P. Arena², D. Bernardi¹, G. Bongiovì², P. A. Di Maio², F. Tagliaferri³

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TPO-120 Qualification Process and Quality Control Planning for JT-60-SA Toroidal Field Coils Construction

V. Cocilovo¹, A. Cucchiario¹, G. M. Polli¹, P. Rossi¹, F. Terzi², G. Drago², S. Cuneo²,
M. Gabriele³, G. Spreccaceneri³

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³*Walter Tosto S.p.A., Chieti, Italy*

TPO-121 DEMO - Initiation of Remote Maintenance Requirements

M. Mittwollen¹, V. Madzharov¹, B. Lorenzo², G. Grossetti³

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TPO-122 Personnel and Equipment Safety Management for Multi Mega Watt Regulated High Voltage Power Supply (80kv, 130A) System

D. V. Modi, P. Patel, L. N. Gupta, C. B. Sumod, D. Thakkar, L. K. Bansal, U. K. Baruah, C. V. S. Rao

Safety section, Institute for Plasma Research, Gandhinagar, India

TPO-123 Comparison with Simulations Using the PHITS code and Activated Materials Analysis toward JT-60SA Radiation Safety Assessment

A. M. Sukegawa¹, K. Okuno²

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²*Hazama Technical Research Institute, Tsukuba-shi / Ibaraki, Japan*

TPO-124 Sensitivity Study on in-Vessel LOCA of a Korean TBS in ITER

H. G. Jin¹, D. W. Lee¹, S. K. Kim¹, J. S. Yoon¹, M. Y. Ahn², S. Cho²

¹*Korea Atomic Energy Research Institute, Deajon, South Korea*

²*National Fusion Research Institute, Deajon, South Korea*

Paper TPO-125 Withdrawn

TPO-126 Tritium Extraction System Pipe Break Environmental Impact by Atmospheric Modelling of Tritium Forms Transport

P. Castro (presented by Susana Reyes)¹, M. Velarde², J. Ardao³, J. M. Perlado², L. A. Sedano¹

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²*Instituto de Fusion Nuclear, DENIM, Madrid, Spain*

³*Environmental Service, AEMET, Madrid, Spain*

TPO-127 A Dynamic Simulation on the Demand of Human Resource for Construction of Korean Fusion Demo

H. Chang¹, D. -Y. Kang¹, H. Tho¹, W. -J. Choi¹, Y. -S. Lee², I. -C. Kim¹

¹*National Fusion Research Institute, Dae-jeon, South Korea*

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TPO-128 Configuration Space Control of In-Vessel Components for Wendelstein 7-X

J. Tretter, J. Boscary, B. Mendelevitch, A. Peacock, R. Stadler

Max-Planck-Institute for Plasma Physics, Garching, Germany

TPO-129 Do we need a Quality Management System in Fusion Research? - Experience from W7-X

R. Vilbrandt¹, H. -S. Bosch², J. -H. Feist¹

¹*Quality Management, Max Planck Institute for Plasma Physics, Greifswald, Germany, Greifswald, Germany*

²*Project Coordination, Max Planck Institute for Plasma Physics, Greifswald, Germany*

TPO-130 Design and Integration of the Ground Level Platform for W7-X

S. Renard¹, J. Krannich², C. Baylard¹, H. Lentz², R. Krampitz², D. Hartmann²

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²*Max-Planck-Institute for Plasma-Physic, EURATOM Association, Greifswald Institute, Greifswald, Germany*

Session TO4: Plasma Control, Divertors

Tuesday, June 11 16:30-18:00, Stanford E

Session Chair: Arnold Lumsdaine, Oak Ridge National Laboratory

16:30 TO4-1 (invited) Cutting Edge Concepts for Control and Data Acquisition for Wendelstein 7-X

A. H. Werner

CoDaC, Max-Planck Institute for Plasma Physics, Greifswald, Germany

16:50 TO4-2 (invited) Tungsten-Copper Divertor Development for EAST

G. -N. Luo¹, D. -M. Yao², J. -G. Li¹

¹*Tokamak Physics Division, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China*

²*Reactor Design Division, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China*

17:10 TO4-3 (invited) Latest Developments on Liquid Lithium at Illinois and Recent Experiments Around the World

D. N. Ruzic¹, W. Xu¹, P. Fflis¹, S. Jung¹, M. Christenson¹, D. Curreli¹, D. Andruczyk^{1,2}

¹*Nuclear, Plasma and Radiological Engineering, University of Illinois, Urbana, IL, United States*

²*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

Paper TO4-4 Withdrawn

17:30 TO4-5 Assessment of an ITER-like Water-Cooled Divertor for DEMO

E. Visca¹, F. Crescenzi¹, A. Moriani¹, A. Li Puma², M. Richou³, S. Roccella¹

¹*Nuclear Fusion/Special Technologies, Associazione Euratom-ENEA sulla Fusione, Frascati, RM, Italy*

²*DEN, Saclay, DM2S, SERMA, CEA, Gif-sur-Yvette, France*

³*IRFM, CEA, Saint Paul Lez Durance, France*

Session TO5: MFE Heating and Current Drive

Tuesday, June 11 16:30-17:55, Stanford W

Session Chair: Richard Callis, General Atomics

16:30 TO5-1 (invited) Recent Advances in the Gyrotron Development Activities Worldwide

M. Thumm

IHM, Karlsruhe Institute of Technology, Karlsruhe, Germany

16:50 TO5-2 (invited) ITER Heating and Current Drive Systems

M. A. Henderson, B. Beaumont, D. Boilson, P. Thmoas

CHD/HCD, ITER Organization, St Paul-lez-Durance, France

17:10 TO5-3 Development of a Large RF Ion Source for the ITER Neutral Beam Injector: Project Overview and First Results of ELISE

R. Nocentini, B. Heinemann, U. Fantz, P. Franzen, M. Froeschle, W. Kraus, C. Martens, R. Riedl, B. Ruf, L. Schiesko, C. Wimmer, D. Wuenderlich
ITER Technology and Diagnostics, Max-Planck-Institut für Plasmaphysik, Garching, Bavaria, Germany

17:25 TO5-4 Progress of Two RF Driver Based Negative Ion Source Experiment

M. Bandyopadhyay, A. Chakraborty, R. Pandey, S. Shah, G. Bansal, A. Gahlaut, D. Parmar, J. Soni, D. Sudhir, R. Yadav, H. Tyagi, K. Pandya, K. Parmar, H. Mistry, M. Vuppugalla
ITER-India, Institute for Plasma Research, Gandhinagar, Gandhinagar, Gujarat, India

17:40 TO5-5 Realization and Testing of Grid Prototypes for the ITER Neutral Beam Injectors

P. Agostinetti, G. Chitarin, D. Marcuzzi, A. Rizzolo
Consorzio RFX, Padova, Italy

Session TO6: Fabrication and Assembly I

Tuesday, June 11 16:30-18:00, Gold Suite

Session Chair: Hans-Stephan Bosch, Max Planck Institute for Plasma Physics

16:30 TO6-1 (invited) Design and Manufacture of the ITER Vacuum Vessel

C. Sborchia
Tokamak, ITER, St. Paul-lez-Durance, France

16:50 TO6-2 (invited) ITER Assembly, Maintenance, and Availability

K. Blackler, F. Sagot, R. Shaw, A. Tesini
Assembly & Operations Division, ITER Organization, St Paul Lez Durance, France

17:10 TO6-3 (invited) Design Progress of ITER Diagnostic First Wall

G. D. Loesser¹, V. S. Udintsev², J. -M. Drevon², R. Feder¹, D. Johnson¹, P. Maquet², S. Pak³, C. P. Pitcher², M. Smith¹, K. Tresemer¹, M. Walsh², Y. Zhai¹

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²*ITER Organization, Saint Paul Lez Durance, France*

³*National Fusion Research Institute, Daejeon, Korea, Daejeon,, Korea*

17:30 TO6-4 Manufacturing of ITER Vacuum Vessel In-Wall Shielding

H. A. Pathak¹, J. R. Raval¹, G. S. Phull¹, R. Laad¹, X. Wang², K. Ioki², P. V. S. Suresh³

¹*ITER-India, Institute for Plasma Research, Gandhinagar, Gujarat, India*

²*ITER Organization, Durance, France*

³*Avasarala Technologies Limited, Bangalore, India*

17:45 TO6-5 Preliminary Design of ITER Component Cooling Water System and Heat Rejection System

A. Kumar¹, D. Gupta¹, N. Patel¹, G. Gohil¹, H. Patel¹, J. Dangi¹, L. Sharma¹, M. Jadhav¹, L. Teodoros², B. Gopalapillai², S. Ployhar², G. Dell'orco²

¹*Cooling Water System, ITER India, Institute For Plasma Research, Gandhinagar, Gujarat, India*

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Wednesday Morning, June 12, 2013

Session WPL: Plenary II

Wednesday, June 12 08:30-10:00, Stanford E+W

Session Chair: Yuanxi Wan, University of Science and Technology of China

8:30 WPL-1 (invited) National Ignition Facility - Status and Future Plans

M. Dunne

Lawrence Livermore National Laboratory, Livermore, CA, United States

9:15 WPL-2 (invited) Korean Fusion Roadmap: K-Demo Design and R&D Plan

G. -S. Lee¹, K. Kim¹, Y. S. Hwang², J. H. Han², H. Neilson³, T. Brown³, P. Titus³, C. Kessel³,
H. C. Kim¹, K. H. Im¹

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³*Princeton Plasma Physics laboratory, Princeton, U.S.A.*

Session WO1: Experimental Devices, Fusion Development I

Wednesday, June 12 10:30-12:25, Stanford E

Session Chair: William Morris, Culham Centre for Fusion Energy

10:30 WO1-1 (invited) EU DEMO Design and R&D Studies

G. Federici

EFDA, Garching, Germany

10:50 WO1-2 (invited) Readiness / Risks for Fusion Next-Steps

T. S. Taylor

General Atomics, San Diego, CA, United States

11:10 WO1-3 (invited) KSTAR Accomplishments and Plans in Support of Fusion Next-Steps

Y. -K. Oh¹, W. C. Kim¹, S. W. Yoon¹, S. G. Lee¹, J. Y. Kim¹, H. L. Yang¹, K. R. Park¹,
Y. S. Bae¹, H. K. Kim¹, J. G. Kwak¹, J. M. Kwon¹, H. Park², W. H. Choe³, K. S. Chung⁴,
Y. S. Hwang⁵, Y. S. Na⁵, S. R. In⁶, M. Walker⁷, J. Park⁸, J. W. Ahn⁹, S. Sabbagh¹⁰, S. Ide¹¹,
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³*KAIST, Daejeon, Korea*

⁴*Hanyang University, Seoul, Korea*

⁵*Seoul National University, Seoul, Korea*

⁶*KAERI, Dajeon, Korea*

⁷*General Atomics, CA, USA*

⁸*PPPL, NJ, USA*

⁹*ORNL, TN, USA*

¹⁰*Columbia University, NY, USA*

¹¹*JAEA, Ibaraki-ken, Japan*

¹²*NIFS, Gifu, Japan*

11:30 WO1-4 (invited) Opportunities for Fusion Materials Science and Technology Research Now and During the ITER Era

B. D. Wirth^{1,2}, R. J. Kurtz³, L. L. Snead²

¹*Nuclear Engineering, University of Tennessee, Knoxville, TN, United States*

²*Oak Ridge National Laboratory, Oak Ridge, TN, United States*

³*Pacific Northwest National Laboratory, Richland, WA, United States*

11:50 WO1-5 (invited) DIII-D Accomplishments and Plans in Support of Fusion Next-Steps

R. J. Buttery

General Atomics, San Diego, CA, United States

12:10 WO1-6 The West Project: a Major Upgrade of Tore Supra for Preparing ITER Operation in a Tungsten Environment

D. M. van Houtte, J. Bucalossi, A. Becoulet, P. Garin, A. Grosman, M. Houry, F. Samaille, E. Tsitrone

DSM/IRFM, CEA, St Paul lez Durance, France

Session WO2: IFE Drivers and Targets

Wednesday, June 12 10:30-12:35, Stanford W

Session Chair: Susana Reyes, Lawrence Livermore National Laboratory

10:30 WO2-1 (invited) Target Fabrication for NIF and Inertial Fusion Energy

A. Nikroo

Inertial Fusion Technology, General Atomics, San Diego, CA, United States

10:50 WO2-2 (invited) Progress Toward Hydro-Equivalent Conventional Ignition and Shock Ignition for Direct Drive ICF

R. Betti

Laboratory for Laser Energetics, University of Rochester, Rochester, NY, United States

11:10 WO2-3 (invited) Magnetically Driven Implosions (MDIs) for Inertial Fusion Energy with Pulsed Power

T. J. Awe¹, M. E. Cuneo¹, M. R. Gomez¹, M. C. Herrmann¹, B. A. Kast¹, M. G. Mazarakis¹, R. D. McBride¹, J. L. McKenney¹, A. C. Owen¹, D. C. Rovang¹, A. B. Sefkow¹, D. B. Sinars¹, S. A. Slutz¹, W. A. Stygar¹, R. A. Vesey¹, P. D. Gard²

¹*Sandia National Laboratories, Albuquerque, NM, United States*

²*Paul Gard Design & Development, Albuquerque, NM, United States*

11:30 WO2-4 (invited) Commercialization Of Laser Inertial Fusion Energy (LIFE) - A Systems Approach

T. M. Anklam, M. Dunne, W. Meier, R. Weinbrecht, D. Hardy, P. Weber, A. Banerjee

Lawrence Livermore National Laboratory, Livermore, CA, United States

11:50 WO2-5 Status and Challenges for Mass-Producing Inertial Fusion Energy Targets Using an Automated Electromechanical Microfluidic Process

D. R. Harding¹, T. B. Jones², W. Wang³, Z. Bei⁴

¹*Chemical Engineering, University of Rochester, Laboratory for Laser Energetics, Rochester, NY, United States*

²*Electrical and Computer Engineering, University of Rochester, Laboratory for Laser Energetics, Rochester, NY, United States*

³*Material Sciences Program, University of Rochester, Rochester, NY, United States*

⁴*Material Sciences Program, University of Rochester, Rochester, NY, United States*

Paper WO2-6 Moved to Poster Session TPO

12:05 WO2-7 Accelerated Evaporative Drying of RF Foam for Target Fabrication

S. -J. Scott, D. Harding

Laboratory for Laser Energetics, University of Rochester, Rochester, NY, United States

Session WO3: Integration and Management

Wednesday, June 12 10:30-12:15, Gold Suite

Session Chair: G. Douglas Loesser, Princeton Plasma Physics Laboratory

10:30 WO3-1 (invited) Numerical Modeling in the Construction of Wendelstein 7-X

V. Bykov, J. Fellingner, F. Schauer, M. Koeppen, K. Egorov, A. Carls, P. van Eeten, A. Dudek, S. Freundt, T. Andreeva, X. Peng

Engineering Subdivision, Max Planck Institute for Plasma Physics, Greifswald, Germany

10:50 WO3-2 (invited) Approaches to Numerical Modeling in the Development Process of Complex Structures for Fusion Devices

O. Neubauer, A. Panin, B. Giesen

IEK-4, Forschungszentrum Juelich GmbH, Juelich, Germany

11:10 WO3-3 The Application of Systems Engineering Principles to the EU Demo Design and R&D Studies

J. D. Harman

PPPT, EFDA, Munich, Germany

11:30 WO3-4 Diagnostic Integration Issues in the Tore Supra Upgrade Project WEST

S. Salasca, F. Samaille, X. Courtois, O. Meyer, F. Micolon, M. -H. Aumeunier, J. -P. Chenevois, D. Raulin

CEA Institute for Magnetic Fusion Research, Saint Paul les Durance, France

11:45 WO3-5 Management of the ITER Configuration Towards Construction Phase

I. I. Kuehn, J. -J. Cordier, S. S. Chiochio, M. M. Kotamaki, J. J. Reich

Central Integration & Engineering office, ITER, St Paul Lez Durance, France

12:00 WO3-6 The Development of a Methodology to Allocate Reliability, Availability, Maintainability and Inspectability Requirements to DEMO

R. J. Brown, M. Porton

The Culham Centre for Fusion Energy, Oxfordshire, United Kingdom

Wednesday Afternoon, June 12, 2013

NIF Tour and Banquet

Thursday Morning, June 13, 2013

Session ThPL: Plenary III

Thursday, June 13 08:30-10:45, Stanford E+W

Session Chair: Yeong-Kook Oh, National Fusion Research Institute

8:30 ThPL-1 (invited) Lesson Learned from the Design of ITER Internal Components

M. Ulrickson

Fusion Technology, Sandia National Laboratories, Albuquerque, NM, United States

9:15 ThPL-2 (invited) Lessons Learned in the Licensing Process of the First Nuclear Installation in Fusion, ITER

C. Alejaldre, J. Elbez-Uzan, L. Rodriguez

Safety Quality and Security, ITER, St. Paul-lez-Durance, FRANCE

10:00 ThPL-3 (invited) Wendelstein 7-X Construction and Future Research Directions

T. Klinger

Max-Planck Institute for Plasma Physics, Greifswald, Germany

Session ThO1: Experimental Devices, Fusion Development II

Thursday, June 13 11:15-12:30, Stanford E

Session Chair: Yuntao Song, Institute of Plasma Physics, Chinese Academy of Sciences

11:15 ThO1-1 (invited) IFMIF: Steps Toward Realization

J. Knaster (presented by M. Pérez)¹, R. Heidinger², M. Sugimoto³

¹*IFMIF, Rokkasho, Japan*

²*F4E, Garching, Germany*

³*JAEA, Rokkasho, Japan*

11:35 ThO1-2 R&D Activities of Multi-Functional Fusion Test Reactor

Y. Wu^{1,2}, J. Jiang¹, M. Wang¹, M. Ni¹, M. Jin¹, G. Song¹, Y. Liao¹, Q. Zeng¹, C. Liu¹, H. Chen^{1,2},
Q. Huang^{1,2}, Z. Zhu¹, C. Li¹

¹*Institute of Nuclear Energy Safety Technology (INEST), Chinese Academy of Sciences, Hefei, China*

²*University of Sciences and Technology of China, Hefei, China*

11:50 ThO1-3 (invited) Acoustically Driven Magnetized Target Fusion

M. G. Laberge

General Fusion, Burnaby, Canada

12:10 ThO1-4 The Spherical Tokamak Path to Fusion Power, Revisited

A. Sykes¹, M. Gryaznevich¹, D. Kingham¹, Z. Melhem², A. Costley¹, G. Smith¹, S. Ball²,
S. Chappell²

¹*Tokamak Solutions UK, Abingdon, United Kingdom*

²*Oxford Instruments, Abingdon, United Kingdom*

Session ThO2: PMI, First Wall, and Divertors I

Thursday, June 13 11:15-12:30, Stanford W

Session Chair: Dennis Youchison, Sandia National Laboratories

11:15 ThO2-1 (invited) Wendelstein 7-X High Heat Flux Components

A. T. Peacock, J. Boscary, H. Greuner, P. Junghanns, B. Mendelevitch, M. Smirnow, R. Stadler, H. Tittes, J. Tretter

IPP Garching Germany, Garching, Germany

11:35 ThO2-2 (invited) Wendelstein 7-X High Heat-Flux Divertor Scraper Element

A. Lumsdaine¹, J. Boscary², J. Harris¹, D. McGinnis¹, J. Lore¹, A. Peacock², J. Tretter²

¹*Fusion Energy Division, Oak Ridge National Laboratory, Oak Ridge, TN, United States*

²*Max Planck Institute for Plasma Physics, Garching, Germany*

11:55 ThO2-3 (invited) Tungsten Experiences in ASDEX Upgrade and JET

R. Neu

ITER Physics, EFDA Central Support Unit, Garching, Germany

12:15 ThO2-4 Design of the C-Mod Advanced Outer Divertor

S. Harrison¹, R. Vieira²

¹*MIT PSFC / PPPL, Cambridge, MA, United States*

²*MIT PSFC, Cambridge, MA, United States*

Session ThO3: MFE Magnets and Power Supplies

Thursday, June 13 11:15-12:25, Gold Suite

Session Chair: Bradley Nelson, Oak Ridge National Laboratory

11:15 ThO3-1 (invited) ITER Power Supply Innovations and Advancements

C. L. Neumeyer¹, I. Benfatto², J. Hourtoule², J. Tao², A. Mankani², F. Milani², S. Nair², I. Suh², H. Tan², J. S. Oh³, M. Wang⁴, A. Roshal⁵

¹*Princeton University Plasma Physics Laboratory, Princeton, NJ, United States*

²*ITER Organization, St. Paul Lez Durance, France*

³*National Fusion Research Institute, Daejeon, Korea*

⁴*China International Nuclear Fusion Energy Program Execution Center, Beijing, China*

⁵*Federal State Unitary Enterprise Efremov Scientific Research Institute of Electrophysical Apparatus, St. Petersburg, Russia*

11:35 ThO3-2 Radial Cooling of a Spherical Torus (ST) TF Centerpost

R. D. Woolley

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

11:50 ThO3-3 Critical Revision of the RFX-mod AC/DC Conversion System Design and Possible Improvements

A. Ferro, J. J. Framarin, L. Novello, A. Zamengo, L. Zanotto, E. Gaio

Consorzio RFX - EURATOM-ENEA Association, Padova, Italy

12:05 ThO3-4 NSTX-U Digital Coil Protection System Software Design

K. Erickson, G. Tchilinguirian, R. Hatcher

ITD, Princeton University Plasma Physics Lab, Princeton, NJ, United States

Thursday Afternoon, June 13, 2013

Session ThPO: Poster II

Poster Session

Thursday, June 13 14:00-16:00, Stanford E+W

Session Chair: Michael Mardenfeld, Princeton Plasma Physics Laboratory
Tiana Dodson

ThPO-1 NSTX-U Vacuum Vessel Design Modification

N. D. Atnafu, M. Denault, M. Smith, L. Dudek, S. Gerhardt, G. Labik, T. Stevenson, P. Titus, W. Blanchard

Engineering, Princeton Plasma Physics Lab (PPPL), Princeton, NJ, United States

ThPO-2 The Investigation Programme of Plasma Discharge On HL-2A Tokamak

X. Song, X. Song

Center for Fusion Science, Southwestern Institute of Physics (SWIP), Chengdu, Sichuan, China

ThPO-3 Physics of CFETR

B. Wan^{1,2}, S. Ding¹, G. Li¹, B. Xiao^{1,2}, J. Qian¹

¹*Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, China*

²*School of Nuclear Science and Technology, University of Science and Technology of China, HeFei, China*

ThPO-4 Investigation of Field Null for HL-2M Tokamak Start Up

J. Liu

103 Division, Southwestern Institute of Physics, Chengdu, China

ThPO-5 The ST25 Tokamak for Rapid Technological Development

A. Sykes, M. Gryaznevich, D. Kingham, N. Sykes, G. Hammond, P. Apte
Tokamak Solutions UK, Abingdon, United Kingdom

Paper ThPO-6 Withdrawn

Paper TPO-7 Withdrawn

ThPO-8 Equilibrium Features of Bean-Shaped Spherical Tokamak Plasmas with an Ergodic Limiter

C. Ribeiro¹, V. I. Vargas¹, J. H. Velazquez², E. Chaves³, K. Tritz⁴

¹*Plasma Laboratory for Fusion Energy and Applications, Instituto Tecnológico de Costa Rica, Cartago, Cartago, Costa Rica*

²*Instituto Nacional de Ciencias Nucleares, Universidad Nacional Autónoma de México, México City, México, México*

³*Instituto Nacional de Investigaciones Nucleares, Salazar, México, México*

⁴*Johns Hopkins University, Baltimore, Maryland, United States of America*

ThPO-9 Engineering Issues to the Stellarator of Costa Rica 1 (SCR-1)

V. I. Vargas, J. Mora, J. Asenjo, E. Zamora, C. Ribeiro, C. Otarola, J. Carvajal-Godinez, C. Piedras

Plasma Laboratory for Fusion Energy and Applications, Costa Rica Institute of Technology, Cartago, Costa Rica

Paper ThPO-10 Withdrawn

ThPO-11 Fluctuation Mitigation and Azimuthal Velocity Profile Regulation by Extremum Seeking in HELCAT

E. Schuster¹, Z. Ilhan¹, H. Wang¹, J. Barry¹, M. Gilmore², A. Ware³

¹*Lehigh University, Bethlehem, PA, United States*

²*University of New Mexico, Albuquerque, NM, United States*

³*University of Montana, Missoula, MT, United States*

ThPO-12 Plasma Centre-Post for Spherical Tokamaks

C. Ribeiro

Instituto Tecnológico de Costa Rica, Cartago, Cartago, Costa Rica

ThPO-13 A Method of Increasing the Rate of Nuclear Fusion Inside an IEC Device

J. E. Lopez

Webster University, Missouri, St. Louis, MO, United States

ThPO-14 Proto-CIRCUS Tilted-Coil Tokamak-Stellarator Hybrid: Construction and Field Line Mapping

A. W. Clark

Columbia University, New York, NY, United States

ThPO-15 Assessment of Copper Based Materials for the Water-Cooled Divertor Concept of the Demo European Fusion Reactor

L. Commin¹, S. Antusch², W. Goldacker³, M. Rieth¹

¹*IAM-AWP, KIT, Karlsruhe, Germany*

²*IAM-WPT, KIT, Karlsruhe, Germany*

³*ITEP, KIT, Karlsruhe, Germany*

ThPO-16 Energy and Particle Impact on W Surface for the Case of Repetitive ELMSs and RE Electrons in Demo Plasmas

Y. L. Igitkhanov, B. N. Bazylev

IHM, Karlsruhe Institute of Technology, Karlsruhe, Germany

ThPO-17 Development Activities for the Target Elements of the Wendelstein 7-X Divertor

J. Boscary, A. Peacock, M. Smirnow, H. Tittes

Max Planck Institute for Plasmaphysics, Garching, Germany

ThPO-18 Thermal Management Using a Hypervapotron; Part III: Summary of Controlling Parameters

R. D. Boyd

Mechanical Engineering, Prairie View A&M University, Prairie View, TX, United States

Paper ThPO-19 Withdrawn

ThPO-20 Investigation into Irradiation Effects in ODS-Alloys Using Ion Implantation and Micromechanical Testing

E. M. Grieveson, S. G. Roberts

Department of Materials, University of Oxford, Oxford, United Kingdom

ThPO-22 PSI Studies at DIII-D

C. Wong¹, D. Rudakov², J. N. Brooks³, D. Buchenauer⁴, C. Chrobak¹, R. Doerner², D. Elder⁵, A. Hassanein³, E. Hollmann², C. Lasnier⁶, T. Leonard¹, R. Maingi⁷, A. McLean⁶, P. Stangeby⁵, D. Wall¹, W. R. Wampler⁸, J. Watkins⁴

¹*General Atomics, San Diego, CA, United States*

²*University California San Diego, San Diego, CA, United States*

³*Purdue University, West Lafayette, IN, United States*

⁴*Sandia National Laboratories, Livermore, CA, United States*

⁵*University of Toronto Institute for Aerospace Studies, Toronto, Canada*

⁶*Livermore National Laboratory, Livermore, CA, United States*

⁷*Princeton Plasma Physics Laboratories, Princeton, NJ, United States*

⁸*Sandia National Laboratories, Albuquerque, NM, United States*

ThPO-23 Thermo-Mechanical Investigation of the New Solid Tungsten Divertor Tile for Special-Purposes at ASDEX Upgrade

N. Jaksic, A. Herrmann, H. Greuner

Max-Planck-Institute for Plasma Physics, 85748 Garching, Germany

ThPO-24 Nanostructured Tungsten Films for Exposure to High-Flux Deuterium Plasmas

M. Passoni¹, D. Dellasega¹, A. Pezzoli¹, M. H. J. 't Hoen², R. Caniello³, E. Vassallo³,

P. A. Zeijlmans van Emmichoven²

¹*Politecnico di Milano and Istituto di Fisica del Plasma, Consiglio Nazionale delle Ricerche, EURATOM-ENEA-CNR Association, Milan, Italy*

²*Dutch Institute for Fundamental Energy Research, Association EURATOM-FOM, Partner in the Trilateral Euregio Cluster, Nieuwegein, Netherlands*

³*Istituto di Fisica del Plasma, CNR, EURATOM-ENEA-CNR Association - Milano (Italy), Milan, Italy*

Paper ThPO-25 Withdrawn

ThPO-26 Dynamic Analysis of the Plasma Facing Components and Their Supports under Electromagnetic Loading for EAST

W. Xu, X. Liu, M. Lu, Y. Song, Z. Wang

Institute of Plasma Physics, Chinese Academy of Science, Hefei, China

ThPO-27 Design Confirmation for the ITER Enhanced Heat Flux First Wall

D. A. Glazunov¹, V. M. Davydov¹, A. A. Gervash¹, D. V. Lyanzberg¹, I. V. Mazul¹,

R. V. Rulev¹, R. Eaton², R. Mitteau², R. Raffray²

¹*Efremov Institute, Saint-Petersburg, Russian Federation*

²*ITER IO Organization, Saint-Paul-l'Église-Durance, France*

Department of Materials, University of Oxford, Oxford, United Kingdom

Paper ThPO-28 Withdrawn

ThPO-29 Grain Size Effects in Nanostructured Tungsten Materials for Magnetic Fusion Applications

S. R. Gonderman¹, O. El-Atwani^{1,2}, G. De Temmerman³, T. Morgan³, K. Bystrov³, M. Efe², J. P. Allain^{1,2}

¹*Nuclear Engineering, Purdue University, West Lafayette, IN, United States*

²*Materials Engineering, Purdue University, West Lafayette, IN, United States*

³*Dutch Institute for Fundamental Energy Research, Nieuwegein, Netherlands*

ThPO-30 Wetting Properties of Liquid Lithium on Select Fusion Relevant Surfaces

P. R. Fiflis, W. Xu, M. Christenson, D. Andruczyk, D. Curreli, D. N. Ruzic

Nuclear, Plasma, and Radiological Engineering, University of Illinois, Urbana-Champaign, IL, United States

ThPO-31 Development and Validation of Reliable CFD Model for the Design of Next Generation PFCs

N. Vetcha (presented by A. Kohli), A. Ying, M. Abdou

Mechanical and Aerospace Engineering, University of California Los Angeles, Los Angeles, CA, United States

ThPO-32 Impact of High Transient Plasma Loads on Beryllium Damage

I. B. Kupriyanov¹, E. V. Basaleev¹, G. N. Nikolaev¹, L. A. Kurbatova¹, V. L. Podkovyrov², A. D. Muzichenko², A. M. Zhitlukhin², L. N. Khimchenko³

¹*A.A. Bochvar Research Institute of Inorganic Materials, Moscow, Russian Federation*

²*TRINITI, Moscow region, Russian Federation*

³*Project Centre of ITER, Moscow, Russian Federation*

ThPO-33 Fault Analysis of Plasma Facing Component Mounts Using Multiphysics Simulation

D. L. Youchison, J. D. Kotulski, M. A. Ulrickson

Fusion Technology, Sandia National Laboratories, Albuquerque, NM, United States

ThPO-34 Upward Facing Lithium Flash Evaporator for NSTX-U

A. L. Roquemore¹, D. Andruczyk², R. Majeski¹, D. K. Mansfield¹, C. H. Skinner¹

¹*Princeton Plasma Physics Laboratory, Princeton NJ, United States*

²*University of Illinois, Urbana Ill, United States*

ThPO-35 Results of the Qualification Test for ITER Blanket First Wall Small-Scale Mockups in Korea

S. -K. Kim¹, H. G. Jin¹, K. I. Shin¹, B. G. Choi¹, E. H. Lee¹, J. -S. Yoon¹, D. W. Lee¹, D. -H. Kim²

¹*Korea Atomic Energy Research Institute, Daejeon, South Korea*

²*National Fusion Research Institute, Daejeon, South Korea*

ThPO-36 Evaluation of Thermal Conductivity of Unidirectional SiC Composite Enhanced with Carbon Fibers

S. Kim¹, H. Gwon¹, R. Kasada¹, S. Konishi¹, Y. Lee¹, T. Hinoki¹, H. Yoon²

¹*Institute of Advanced Energy, Kyoto University, Kyoto, Japan*

²*Department of Mechanical Eng., Dong-eui University, Busan, Korea*

ThPO-37 Optimization of Functionally Graded Materials for Plasma Facing Components by Finite Element Methods

D. S. Krishnan, S. Kanpara, S. S. Khirwadkar, Y. Patil

Divertors & First Wall Division, Institute for Plasma Research, Gandhinagar, Gujarat, India

ThPO-38 Anisotropic Heat Transfer Characteristics of Composite Material Enhanced with High Thermal Conductivity Fiber

H. Gwon, S. Kim, R. Kasada, S. Konishi

Institute of Advanced Energy, Kyoto University, Kyoto, Japan, Kyoto, Japan

ThPO-39 He-Cooled Divertor: Study on Low-Temperature Design Using Ta Alloy as Thimble Material

P. Norajitra¹, W. Basuki¹, B. Koncar², L. Spatafora¹

¹*Institute for Applied Materials/Materials Processing Technology (IAM-WPT), Karlsruhe Institute of Technology (KIT), Karlsruhe, BW, Germany*

²*Josef Stefan Institute, Ljubljana, Slovenia*

Paper ThPO-40 Withdrawn

Paper ThPO-41 Withdrawn

ThPO-42 Chemical Behavior and Physical Diffusion of Lithium Coatings on Bulk Tungsten under Medium to High Fluence Deuterium and Helium Ion Irradiation

A. L. Neff¹, J. P. Allain¹, O. El-Atwani¹, G. De Temmerman²

¹*Purdue University, West Lafayette, Indiana, United States*

²*Dutch Institute for Fundamental Energy Research, Nieuwegein, Utrecht, Netherlands*

Paper ThPO-43 Withdrawn

ThPO-44 Physics and Engineering Design of the Divertor Scraper Element for the W7-X Stellarator

J. D. Lore¹, J. H. Harris¹, A. Lumsdaine¹, D. McGinnis¹, T. Andreeva², S. Bozhenkov²,

J. Geiger², H. Hoelbe², J. Boscary³, A. Peacock³, J. Tipton⁴

¹*ORNL, Oak Ridge, TN, United States*

²*IPP, Greifswald, Germany*

³*IPP, Garching, Germany*

⁴*U. Evansville, Evansville, IN, United States*

ThPO-45 Numerical Analysis and Optimization of Divertor Cooling System

A. E. Khodak, M. A. Jaworski

PPPL, Princeton, NJ, United States

ThPO-46 Modeling Technique to Predict Fields, Currents and Loads for C-Mod's Advanced Outer Divertor During a Disruption with a 2ma Plasma Current and 9t Toroidal Field

J. W. Doody, B. Lipschultz, W. Beck, L. Zhou

PSFC, MIT, Cambridge, MA, United States

ThPO-47 Modification of NSTX-U Row 1 Outboard and Inboard Divertor Tiles for the Protection of the PF-1C Coils

K. Tresemer, S. Gerhardt, A. Brooks, A. Jariwala, R. Raman

Engineering, Princeton Plasma Physics Laboratory, Princeton, New Jersey, United States

ThPO-48 Parameterization of Kinetic Monte Carlo Simulations of Single Dislocation Motion in Tungsten

D. Cereceda^{1,2}, J. Marian², J. M. Perlado¹

¹*INSTITUTO DE FUSION NUCLEAR, MADRID, Spain*

²*LAWRENCE LIVERMORE NATIONAL LABORATORY, LIVERMORE, CA, USA*

ThPO-49 Evaluation of Material Erosion from Plasma-Facing Surfaces in Hard Disruptions via Simulated Ablation Due to Heat Flux in Electrothermal Discharges

J. R. Echols, A. L. Winfrey

Nuclear Engineering Program, Virginia Polytechnic Institute and State University, Blacksburg, VA, United States

ThPO-51 First Results from the Liquid Lithium Film Experiment (LiLiFEx).

J. Gurrola-Gonzalez, C. Sandoval-Rios, M. Nieto-Perez, R. Avalos-Zuniga

CICATA Queretaro, IPN, Queretaro, Mexico

ThPO-52 Experimental Test of Cryogenic Target as Online Lithium Evacuator in Tokamak T-11M

S. V. Mirnov¹, N. T. Djigailo¹, V. B. Lazarev¹, V. M. Nestserenko¹, I. E. Lyublinski²,
A. V. Vertkov²

¹*TRINITI, Moscow, Russian Federation*

²*JSC Red Star, Moscow, Russian Federation*

ThPO-53 Elasto Plastic Analyses of Thermal Stress Induced by High Heat Loading on Tungsten Materials

K. Tokunaga¹, T. Ukita², H. Kurishita³, K. Araki¹, T. Fujiwara¹, Y. Miyamoto¹, M. Hasegawa¹,
K. Nakamura³

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³*Institute for Materials Research, Tohoku University, Oarai, Ibaraki 311-1313, Japan*

ThPO-54 Development of Materials for the First Wall of a Nuclear Fusion Reactor

D. Garoz Gomez¹, I. Fernandez-Martinez^{2,3}, R. Gonzalez-Arrabal¹, A. Rivera¹, N. Gordillo^{1,4},
M. Panizo¹, G. Valles¹, F. Briones³, J. M. Perlado¹

¹*Instituto de Fusion Nuclear (UPM), Madrid, Spain*

²*Instituto de Energia Solar (UPM), Madrid, Spain*

³*Instituto de Microelectronica de Madrid (CSIC), Tres Cantos, Spain*

⁴*CEI Campus Moncloa (UPM-UCM), Madrid, Spain*

ThPO-55 Hardening Parameters for Modelling CuCrZr and OFHC Copper under Cyclic Loadings

M. Dalla Palma

Consorzio RFX, Padova, Italy

ThPO-56 Filament Power Supplies (AC-AC Converters) and Their Design for Long Pulse Neutral Beam Injector of SST-1

D. P. Thakkar, P. J. Patel, V. B. Patel, V. Vadher, C. B. Sumod, L. Gupta, L. K. Bansal, K. Qureshi, U. K. Baruah

NBI group, Institute for Plasma Research, Gandhinagar, India

ThPO-57 The ITER ECH&CD Upper Launcher: Steps Towards Final Structural Design of the First Confinement System

P. Spaeh¹, G. Aiello¹, R. Gessner¹, T. Goodman², G. Grossetti¹, M. Henderson³, A. Meier¹, D. Ronden⁴, G. Saibene⁵, T. Scherer¹, S. Schreck¹, A. Serikov⁶, D. Strauß¹, A. Vaccaro¹, B. Weinhorst⁶

¹*Institute for applied materials, KIT, Karlsruhe, Germany*

²*Centre de recherches en physique des plasmas, EPFL, Lausanne, Switzerland*

³*ITER-IO, Cadarache, France*

⁴*Dutch institute for fundamental energy research, FOM, Nieuwegein, Netherlands*

⁵*F4E, Barcelona, Spain*

⁶*Institute for neutron physics and reactor technology, KIT, Karlsruhe, Germany*

ThPO-58 Effect of Magnetic Field on Voltage Holding in the MITICA Electrostatic Accelerator

N. Pilan, G. Chitarin, A. De Lorenzi, G. Serianni

Consorzio RFX, Padova, Italy

ThPO-59 Simulational Studies of the Wire-Array Z-Pinch Implosions

N. Ding, D. Xiao, J. Wu, Y. Zhang, Z. Dai, J. Huang, C. Ning, S. Sun, C. Xue, X. Shu

Institute of Applied Physics and Computational Mathematics (IAPCM), Beijing, China

ThPO-60 Theoretical and Experimental Investigations on the Interaction of Wire-Array Z-Pinch with Low Density Foam

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ThPO-61 Study of Protection Strategies Against Breakdown Effects in the SPIDER Experiment

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ThPO-62 An Alternative Design Concept for the DNB Calorimeter Motion Mechanism

I. Ahmed¹, R. Gnagadharan¹, M. Bandyopadhyay¹, C. Rotti¹, R. Prasad¹, H. Patel¹, S. Pillai¹, J. Joshi¹, R. Yadav¹, A. Yadav¹, V. Muvvala¹, A. Chakraborty¹, J. Chareyre², J. Graceffa², D. Shah², L. Svensson², B. Schunke², R. Hemsworth², D. Boilson²

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ThPO-63 Attachment of Ferrite Material Used in an Active Matching Network for LHCD on Alcator C-Mod

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ThPO-64 Optimization of Beam Optics and Strategies for Focusing the Multi-Beamlet Accelerator of the MITICA Injector

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ThPO-65 Operation of a Double Stub Tuner for Alcator C-Mod Lower Hybrid Current Drive System

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ThPO-66 Radio Frequency Additional Heating Systems Issues for the Tore-Supra West Project

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ThPO-67 The ITER Neutral Beam Vacuum Vessel Design

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ThPO-68 Upgrades and Performance of the Electron Cyclotron Heating System on DIII-D

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ThPO-69 Molybdenum Armour Layer on Copper Plates: Manufacturing Technologies and Tests of Prototypes

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ThPO-70 A New High-Efficiency Stepper Motor Driver for Old Technology Stepper Motors

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ThPO-71 Beam Transport and Interactions with Beam-Line Components in MITICA Injector

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ThPO-72 Two-Stage Heating Mechanism for Plasma Fusion at 10 MK

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ThPO-73 Multiphysics Modeling of Components for the ITER ECH Waveguide

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ThPO-74 Electrical Fault Protection System for Fusion Devices

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ThPO-75 A Study of Mode Conversion and Output Beam Profile in Long Distance Corrugated Waveguide Transmission Line

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Paper ThPO-76 Withdrawn

ThPO-77 Design Status of ITER IC H&CD Plant System Control

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ThPO-78 3.7 GHz 500kW CW Klystron Operation at Full Power for SST1 LHCD System

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ThPO-79 Control of the Magnetic Field Configuration in the MITICA Neutral Beam Injector

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ThPO-80 Design of Beam Dump for Spider Facility

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ThPO-81 Development of Steady-State Mirrors for the KSTAR ECH Launchers

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ThPO-82 Dynamic RF Power Control for DIII-D ICH/Fast Wave Operation

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ThPO-83 ITER Ion and Electron Cyclotron Transmission Line: Design Status and Design Validation Tests

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ThPO-84 Negative Hydrogen Ion Density and Extraction Current Measurements in RF Based Negative Ion Source, ROBIN, at IPR

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ThPO-85 Commissioning of 42GHz/500kW ECRH System on Tokamak SST-1

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ThPO-86 A Method to Produce Lithium Pellets for Fueling and ELM Pacing in NSTX-U

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ThPO-87 Characteristics of Rail Gun Plasma as a Small-scale ELM Simulator

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ThPO-88 Optimization of Capillary Source Geometry for Maximum Pellet Exit Velocity in Electrothermal Plasma Launchers

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ThPO-89 A Computational Study of Fusion Fuel Pellet Volume and Geometry Effects on Release Pressure and Velocity

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Paper ThPO-90 Moved to Session TPO

ThPO-91 VME Based Data Acquisition and Control System for Gyrotron Based ECRH System on SST-1

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ThPO-92 Polarization-Resolved Laser Induced Breakdown Spectroscopy for in-Situ Compositional Analysis of Deposited Layers of Fusion Devices

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ThPO-93 The Preliminary Design of Global Interlock System in J-Text

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ThPO-94 Eddy Current and Potential Gap Voltage at Electrical Contacts of ITER Diagnostic First Walls and Shield Modules During Plasma Disruption

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ThPO-95 Design and R&D for MITICA Thermal Sensors

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ThPO-96 Signal Conditioning & Data Acquisition System for Neutral Beam Calorimeter for NBI SST-1

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ThPO-97 Assembly and Installation of ITER in-Vessel Electrical Looms

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ThPO-98 A Remote Control System for Tokamak Based on Web Service

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Paper ThPO-99 Withdrawn

ThPO-100 The Charge Exchange Recombination Spectroscopy Diagnostic on HL-2A Tokamak

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ThPO-101 Design and Test of a Thermal Measurement System Prototype for Spider Experiment

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ThPO-102 The Digital Control System for the TCV Tokamak

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ThPO-104 ITER Disruption Mitigation System Development and Port Plug Integration

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ThPO-105 Level Monitoring Technology of Liquid Metal Alloy for DFLL-TBM

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ThPO-106 A New Method and Experiment for Real-Time Three-Dimensional Displacement Measurement of EAST Magnets Based on Computer Vision

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ThPO-107 First Consideration of Diagnostic System for Chinese Fusion Engineering Testing Reactor (CFETR)

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ThPO-108 Optical Layout and Alignment Methods for Visible Tomography and Emission Spectroscopy Diagnostics in Spider

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ThPO-109 Mechanical Design of the ITER Low Field Side Reflectometer Diagnostic System

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ThPO-110 A Magnet Current Monitor for Gyrotron Magnet Power Supplies

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ThPO-111 Upgrade of the Materials Analysis Particle Probe (MAPP) Plasma-Facing Component Diagnostic

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ThPO-112 Effect of the Measurement vs. the Counting Errors in Neutron Tomography Analysis

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ThPO-113 Digital Coil Protection System I/O and Data Subsystem for NSTX-U

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ThPO-114 Reconfigurable Timing Unit for NSTX-U

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ThPO-116 Electromagnetic Behavior on ITER Radial Soft X-Ray Camera

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ThPO-117 Divertor Erosion Monitoring in ITER Using 2-Wavelength Speckle

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Paper ThPO-118 Withdrawn

ThPO-119 Hardware Requirements for Digital Nuclear Radiation Spectroscopy

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ThPO-120 Status of the Design Refinement and the Characterisation of the in Vessel Viewing System for ITER

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ThPO-121 Analysis of Loop Voltage Difference for Vertical Control on KSTAR

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ThPO-122 Design and Preliminary Measurements of a Diagnostic Calorimeter for BATMAN

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R. Riedl³, A. Rizzolo¹, B. Ruf³, L. Schiesko³, M. Valente¹, P. Veltri¹, V. Cervaro¹, D. Fasolo¹,
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ThPO-124 Development of Talbot-Lau Phase-Contrast Method for High Energy Density Diagnostics

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ThPO-125 Optimal Closed-Loop Control of the Azimuthal Velocity Profile by ExB Actuation in HELCAT

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ThPO-126 Digital Coil Protection System for the National Spherical Torus Experiment Upgrade

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ThPO-127 A Fast RF Power Diagnostics for the DIII-D Fast Wave Current Drive System Using Commercial FPGA-Based Systems

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ThPO-128 Neutronics Instrumentation for the European ITER TBM

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ThPO-129 Latest Advancements in the DIII-D Plasma Control System

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ThPO-130 Designing, Constructing and Using Plasma Control System Algorithms on DIII-D

A. W. Hyatt¹, D. A. Humphreys¹, N. W. Eidietis¹, J. R. Ferron¹, J. M. Hanson², R. D. Johnson¹,

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Paper ThPO-131 Withdrawn

ThPO-132 Shape Reconstruction of RF-Driven Divertor Plasma on QUEST

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ThPO-133 Diagnostic Neutral Beam Injector for Wendelstein W7-X

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ThPO-134 Assessment and Optimization of the Interspace Dose Rate of the Diagnostics Equatorial Port Plug #3 in ITER with ATTILA

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Session ThO4: PMI, First Wall, and Divertors II

Thursday, June 13 16:30-17:35, Stanford E

Session Chair: Mark Tillack, University of California at San Diego

16:30 ThO4-1 (invited) In-Situ TEM Irradiation-Driven Damage on Nanostructured Tungsten Materials as Potential Future Burning Plasma Device PFC Surface Coatings

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16:50 ThO4-2 Heat Transfer Design of an Innovative Divertor Component

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17:05 ThO4-3 Heat Transfer Simulation of C-Mod Advanced Outer Divertor

L. Zhou¹, R. Vieira¹, S. Harrison^{1,2}, D. Karnes^{1,2}, B. Lipschultz¹

¹*Plasma Science and Fusion Center, Massachusetts Institute of Technology, Cambridge, MA, United States*

²*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

17:20 ThO4-4 Deuterium Retention in Tungsten at Fuego Nuevo II

G. Ramos¹, J. J. E. Herrera-Velazquez², F. Castillo²

¹*Centro de Investigacion en Ciencia Aplicada y Tecnologia Avanzada Unidad Queretaro, Insitituto Politecnico Nacional, 76090 Queretaro, Mexico*

²*Instituto de Ciencias Nucleares, Universidad Nacional Autonoma de Mexico, 04310 D.F., Mexico*

Session ThO5: Safety & Environmental Engineering

Thursday, June 13 16:30-18:00, Stanford W

Session Chair: Charles Kessel, Princeton Plasma Physics Laboratory

16:30 ThO5-1 (invited) Developing the Safety Basis for Laser Inertial Fusion Energy

S. Reyes

LLNL, Livermore, CA, United States

16:50 ThO5-2 (invited) Korean Activities on Fusion Safety

G. Heo¹, H. J. Kim², H. C. Kim², S. H. Chang³, J. K. Kim⁴, Y. S. Kim⁵, M. Kwon²

¹*Nuclear Engineering, Kyung Hee University, Yongin, South Korea*

²*National Fusion Research Institute of Korea, Daejeon, South Korea*

³*KAIST, Daejeon, South Korea*

⁴*Hanyang University, Seoul, South Korea*

⁵*Chung-Ang University, Seoul, South Korea*

Paper ThO5-3 Withdrawn

17:10 ThO5-4 Feasibility Study of Validating Activation Corrosion Products Calculations in Cooling Water Loops at Jet

L. Di Pace¹, P. Batistoni², N. Bekris², A. Whitehead³

¹*EURATOM/ENEA Fusion Association, Frascati, Italy*

²*EFDA - JET Abingdon Culham Science Centre, Culham, Abingdon, United Kingdom*

³*Culham Centre for Fusion Energy (CCFE), Culham, Abingdon, United Kingdom*

17:25 ThO5-5 Failure Rate Adjustment Factors for High Technology Components

L. C. Cadwallader

Fusion Safety Program, Idaho National Laboratory, Idaho Falls, ID, United States

Session ThO6: Fabrication and Assembly II

Thursday, June 13 16:30-17:20, Gold Suite

Session Chair: Carlo Sborchia, ITER Organization

16:30 ThO6-1 (invited) W7-X Precision Metrology

T. Braeuer

Max Planck Institute for Plasma Physics, EURATOM Association, Greifswald, Germany

Paper ThO6-2 Withdrawn

16:50 ThO6-3 Concurrent Engineering and Mechanical Integration in the Experimental Hall of Wendelstein 7-X: Issue, Solutions, Lessons Learned

C. Baylard¹, D. Hartmann², S. Renard¹, M. Banduch², D. Beiersdorf², T. Kobarg², T. Suhrow², A. Holtz², N. Ose²

¹*Institute for Magnetic Fusion Research (IRFM), Commissariat a l'energie atomique et aux energies alternative (CEA), St Paul lez Durance, France*

²*Teilinstitut Greifswald, Max-Planck-Institut fuer Plasmaphysik, Greifswald, Germany*

Friday Morning, June 14, 2013

Session FO1: Experimental Devices, Fusion Development III

Friday, June 14 08:30-10:10, Stanford E

Session Chair: William Spears, Fusion for Energy

8:30 FO1-1 (invited) LHD Accomplishments/Plans in Support of Fusion Next-Steps

S. Imagawa, Y. Takeiri, T. Mutoh, T. Mito, H. Chikaraishi, S. Hamaguchi, H. Igami, K. Ikeda, A. Iwamoto, H. Kasahara, M. Kasaki, S. Kubo, K. Nagaoka, H. Nakano, M. Osakabe, K. Saito, T. Seki, T. Shimozuma, H. Takahashi, K. Takahata, H. Tamura, K. Tsumori, S. Yamada, N. Yanagi, Y. Yoshimura, H. Yamada, O. Kaneko, A. Komori

Department of Helical Plasma Research, National Institute for Fusion Science, Toki, GIFU, Japan

8:50 FO1-2 (invited) Alcator C-Mod Accomplishments & Plans in Support of Fusion Next-Steps

D. G. Whyte, C-Mod team

MIT, Cambridge MA, United States

9:10 FO1-3 (invited) Real Time Control of Plasma Performance on ASDEX Upgrade and Its Implications for ITER

W. Treutterer, L. Giannone, A. Kallenbach, C. Rapson, G. Raupp, M. Reich

Max-Planck Institute for Plasma Physics, Garching, Germany, Garching, Germany

9:30 FO1-4 Systems Analysis Exploration of Operating Points for the Korean Demo Program

C. E. Kessel¹, J. H. Yeom², K. Kim², T. G. Brown¹, P. Titus¹, G. H. Neilson¹

¹*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

²*National Fusion Research Institute, Daejeon, Korea*

9:45 FO1-5 Power Production and Environmental Aspects of a Fusion-Hybrid Reactor

T. Kammash, M. Orians

Nuclear Engineering, University of Michigan, Ann Arbor, MI, United States

Session FO2: Chambers, Blankets, and Shields

Friday, June 14 08:30-10:10, Stanford W

Session Chair: David Harding, University of Rochester

8:30 FO2-1 (invited) ITER Blanket Engineering Challenges and Solutions

R. Raffray¹, B. Calcagno¹, P. Chappuis¹, G. Dellopoulos², Z. Fu¹, C. Jiming³, D. -H. Kim⁴, S. Khomiakov⁵, A. Labusov⁶, A. Martin¹, M. Merola¹, R. Mitteau¹, M. Ulrickson⁷

¹*ITER Organization, Vinon-sur-Verdon, France*

²*F4E (Fusion for Energy), Barcelona, Spain*

³*SWIP, CN ITER Domestic Agency, Chengdu, China*

⁴*NFRI, ITER Korea, Daejeon, Korea*

⁵*NIKIET, Moscow, RF*

⁶*NIIIEFA Efremov, St Petersburg, RF*

⁷*Sandia National Laboratory, Albuquerque, USA*

8:50 FO2-2 (invited) Relevance of TBM Programme to Demo Power and Tritium Extraction

L. V. Boccaccini, U. Fischer

Institute for Neutron Physics and Reactor Technology (INR), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

9:10 FO2-3 In-Service Inspection and Instrumentation for ITER Vacuum Vessel

K. Ioki¹, H. J. Ahn², C. H. Choi¹, B. Giraud¹, C. Hamlyn-Harris¹, R. Le Barbier¹, R. Pearce¹, F. Sartori³, C. Sborchia¹, P. Teissier¹

¹*Tokamak Directorate, ITER Organization, St Paul-lez-Durance, France*

²*NFRI, Daejeon, Korea*

³*F4E, Barcelona, Spain*

9:25 FO2-4 Transient Electromagnetic Analysis of Selected Blanket Modules of the ITER Blanket System Due to Plasma Disruption

J. D. Kotulski, R. S. Coats, M. A. Ulrickson

Sandia National Laboratories, Albuquerque, NM, United States

9:40 FO2-5 Development and Progress in SiC Composite Integration Technology for Fusion Energy

Y. Katoh¹, L. L. Snead¹, C. H. Henager², T. Hinoki³, M. Ferraris⁴

¹*Oak Ridge National Laboratory, Oak Ridge, TN, United States*

²*Pacific Northwest National Laboratory, Richland, WA, United States*

³*Kyoto University, Kyoto, Japan*

⁴*Politecnico di Torino, Torino, Italy*

Session FO3: Tritium

Friday, June 14 08:30-10:10, Gold Suite

Session Chair: Thomas Awe, Sandia National Laboratories

8:30 FO3-1 (invited) Evaluation of Tritium Capture Systems

W. T. Shmayda

Laboratory for Laser Energetics, University of Rochester, Rochester, New York, United States

Paper FO3-2 Withdrawn

8:50 FO3-3 Preliminary Considerations of D-T Fuel Recycling and Tritium Safety System for CFETR

H. Wang, S. Peng, X. Wang

Institute of Nuclear Physics and Chemistry, China Academy of Engineering Physics, Mianyang, Sichuan, China

9:05 FO3-4 Tritium Permeation Issues for Helium-Cooled Breeding Blankets

F. Franza¹, L. V. Boccaccini¹, A. Ciampichetti², D. Demange³, M. Zucchetti⁴

¹*Institute of Neutron Physics and Reactor Technology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, D-76344, Germany*

²*ENEA C.R. Brasimone, Boulogne, I-40032, Italy*

³*Institute for Technical Physics, Tritium Laboratory Karlsruhe, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, D-76344, Germany*

⁴*Department of Energetics, Politecnico di Torino, Turin, I-10129, Italy*

Session FPL: Plenary IV

Friday, June 14 10:40-12:55, Stanford E+W

Session Chair: Hutch Neilson, Princeton Plasma Physics Laboratory

10:40 FPL-1 (invited) Inertial Fusion Energy with Direct Drive and KrF Lasers

M. Karasik

Plasma Physics Division, Naval Research Laboratory, Washington, DC, United States

11:25 FPL-2 (invited) Design and Strategy for CFETR

Y. X. Wan

University of Science and Technology of China, Hefei, China, Hefei, China

12:10 FPL-3 (invited) JT-60SA Construction and Research Directions

W. Spears

Broader Fusion Development Department, Fusion for Energy, Garching, Germany