

SOFE Program (4/7/15 draft)

Session SX1: Plenary-1

Monday, June 1 08:00-09:30, Salons J & K

Session Chair: Mark S Tillack, UC San Diego

8:00 SX1-1 Announcements and Opening Remarks I

M. Tillack¹, J. P. Allain²

¹UC San Diego, La Jolla, CA, United States

²University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, United States

8:10 SX1-2 (invited) Fusion Readiness: Engineering, Economical, Safety, Power extraction

G. Janeschitz, M. Glugla

ITER Organization, St Paul Lez Durance, France

8:50 SX1-3 (invited) Smaller & Sooner: Exploiting New Technologies for Fusion's Development

D. Whyte

MIT PSFC, Cambridge MA, United States

Session SO1: Experimental Devices I

Monday, June 1 10:00-12:00, Salon J

Session Chair: Felix Schauer, Max-Planck-Institute for Plasma Physics

10:00 SO1-1 (invited) The NSTX-U Program for Closing Gaps to Fusion Energy

J. E. Menard, NSTX-U Research Team

Princeton Plasma Physics Laboratory, Princeton, NJ, United States

10:20 SO1-2 (invited) The W7-X Programme - Demonstration of a Stellarator Option for Fusion Energy

R. C. Wolf

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

10:40 SO1-3 (invited) JET Program for Closing Gaps to Fusion Energy

X. Litaudon

Head of Department, EUROfusion, Abingdon, United Kingdom

11:00 SO1-4 (invited) ASDEX Upgrade Program for Closing Gaps to Fusion Energy

R. L. Neu^{1,2}, A. Herrmann¹, A. Kallenbach¹, J. -M. Noterdaeme¹, G. Pautasso¹, J. Schweinzer¹, J. Stober¹,
W. Suttrop¹, M. Reich¹, A. U. Team¹

¹Plasma Edge and Wall, Max-Planck-Institut fuer Plasmaphysik, Garching, Germany

²Plasma Material Interaction, Technische Universitaet Muenchen, Garching, Germany

11:20 SO1-5 (invited) West Program for Closing Gaps to Fusion Energy

J. Bucalossi

IRFM, CEA, St Paul lez Durance, France

11:40 SO1-6 (invited) Challenges and Efforts for Achieving Steady-State Plasma Operation on EAST

B. Wan

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

Session SO2: Diagnostics Engineering and Integration

Monday, June 1 10:00-12:00, Salon K

Session Chair: William M Burke, MIT Plasma Science and Fusion Center

10:00 SO2-1 (invited) Development of ITER Generic Diagnostic First Wall for a Wide Range of Diagnostic Configurations

G. D. Loesser¹, M. Smith¹, Y. Zhai¹, W. Wang¹, M. Duco¹, C. Hause¹, V. Udintsev², T. Giacomini², J. Guirao²

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

²Diagnostics, ITER Organization, Saint- Paul-L s-Durance, France

10:20 SO2-2 (invited) Engineering Challenges for Diagnostic Systems on ITER

R. Feder¹, D. Johnson¹, Y. Zhai¹, D. Loesser¹, V. Udintsev², T. Giacomini², J. Guirao²

¹USITER Diagnostic Engineering, Princeton Plasma Physics Lab, Princeton, New Jersey, United States

²*IO Diagnostics Division, ITER Organization, Saint-Paul-Léon-Durance, France*

10:40 SO2-3 (invited) The Engineering and Operation of AIMS, an In-Situ Accelerator-Based Diagnostic for Plasma Facing Components

Z. S. Hartwig, H. S. Barnard, B. N. Sorbom, L. A. Kesler, W. M. Burke, J. Doody, R. C. Lanza, P. W. Stahle, D. R. Terry, R. F. Vieira, D. G. Whyte, L. Zhou

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

11:00 SO2-4 (invited) Integration of Diagnostics on ITER

M. Walsh and the ITER Team

Diagnostics Division, ITER Organization, St Paul-Lez-Durance, France

11:20 SO2-5 (invited) Engineering the Alcator C-Mod MSE Diagnostic: Solutions to Reactor-Relevant Diagnostic Challenges

R. T. Mumgaard¹, S. D. Scott²

¹*MIT Plasma Science and Fusion Center, Cambridge, MA, United States*

²*PPPL, Princeton, NJ, United States*

11:40 SO2-6 Electromagnetic Analysis of ITER Diagnostic Port Plugs and Diagnostic Systems During Plasma Events

Y. Zhai¹, A. Brooks¹, R. Roccella², M. Smith¹, S. Pak³, J. Guirao², H. Zhang¹

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

²*ITER Organization, Cadarache, France*

³*National Fusion Research Institute, Yuseong-gu, Daejeon, South Korea*

Session SO3: Innovative Divertor Concepts

Monday, June 1 10:00-12:00, Room 616

Session Chair: Rajesh Maingi, PPPL

10:00 SO3-1 (invited) Developing Snowflake Divertor Physics Basis in the DIII-D, NSTX AND NSTX-U Tokamaks Aimed at the Divertor Power Exhaust Solution

V. A. Soukhanovskii

Fusion Energy Sciences Program, Lawrence Livermore National Laboratory, Livermore, CA, United States

10:20 SO3-2 (invited) Experimental Studies of the Snowflake Divertor in TCV

H. Reimerdes¹, G. P. Canal¹, G. Ciraolo², B. P. Duval¹, B. Labit¹, B. Lipschultz³, T. Lunt⁴, F. Nespoli¹, U. Sheikh¹, C. Theiler¹, C. Tsui⁵, K. H. A. Verhaegh³, W. A. J. Vijvers⁶

¹*CRPP, Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland*

²*IRFM, CEA, St. Paul-lez-Durance, France*

³*York Plasma Institute, University of York, York, UK*

⁴*Max Planck Institut für Plasmaphysik, Garching, Germany*

⁵*University of California San Diego (UCSD), San Diego, USA*

⁶*FOM Institute DIFFER, Nieuwegein, The Netherlands*

10:40 SO3-3 (invited) Design of LiMIT Type Test Module as a Limiter

D. N. Ruzic¹, W. Xu¹, P. R. Fflis¹, T. W. Morgan², M. Christenson¹, M. Szott¹, S. Brons², G. G. van Eden², M. A. Van Den Berg², K. Kalathiparambil¹

¹*University of Illinois, Urbana, IL, United States*

²*FOM Institute DIFFER, Nieuwegein, The Netherlands*

11:00 SO3-4 (invited) Prospects for Power and Particle Exhaust with High-Temperature Liquid Lithium Divertors

M. A. Jaworski

NSTX Experimental, Princeton Plasma Physics Laboratory, Princeton, NJ, United States

11:20 SO3-5 (invited) X- and Super-X Divertor Topologies

P. M. Valanju, B. Covele, M. T. Kotschenreuther, S. M. Mahajan

University of Texas at Austin, Institute for Fusion Studies, Austin, TX, United States

11:40 SO3-6 (invited) Innovative Divertor Concept Development on DIII-D and East

H. Guo^{1,2}

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

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

Session SO4: ITER Plasma-Facing Components

Monday, June 1 13:00-15:00, Salon J

Session Chair: Rene Raffray, ITER Organization

13:00 SO4-1 (invited) The Design of the First Wall Panel for ITER Tokamak

R. Mitteau¹, L. Bao¹, B. Calcagno¹, P. Chappuis¹, R. Eaton¹, S. Gicquel¹, M. Merola¹, R. Raffray¹, P. Stangeby²

¹Dir. TKM, ITER organisation, Saint Paul les Durances, France

²Institute for Aerospace Studies, Univ. of Toronto, Toronto, Canada

13:25 SO4-2 (invited) The ITER Divertor Plasma Facing Components

F. A. Escourbiac¹, V. Barabash¹, S. Carpentier², A. Durocher¹, A. Fedosov¹, L. Ferrand¹, S. Gicquel¹,

K. Hernandez¹, T. Hirai¹, V. Komarov¹, A. Martin¹, M. Merola¹, S. Panayotis¹

¹ITER Organization, 13067 Saint-Paul-Lez-Durance, France

²EIRL S. Carpentier-Chouchana, 13650 Meyrargues, France

13:50 SO4-3 (invited) European Experience on ITER Plasma Facing Components Fabrication

P. Lorenzetto, S. Banetta, B. Bellin, T. Cicero, P. Gavila, P. Marshall, B. Riccardi, F. Zacchia, G. Dellopoulos

Fusion for Energy, Barcelona, Spain

14:15 SO4-4 (invited) Integration of Plasma Facing Components at ITER

A. Martin, A. Arnould, J. Gonzalez, P. Martin, G. Martinez, C. Millot, F. Sabourin

ITER, St Paul lez Durance, France

14:40 SO4-5 (invited) Assembly and Remote Handling of ITER Plasma Facing Components

B. J. Macklin¹, L. Bao¹, P. Chappuis¹, S. Diez², F. Escourbiac¹, S. Gicquel¹, S. Humphreys³, M. Norman³,

R. Raffray¹, J. Wagrez², D. Wilson¹

¹ITER ORGANIZATION, St Paul lez Durance, France

²Assystem Engineering & Operation Services, Pertuis, France

³Jacobs Nucl@aire, Aix-en-Provence, France

Session SO5: Heating and Current Drive I

Monday, June 1 13:00-15:00, Salon K

Session Chair: John T. Scoville, General Atomics

13:00 SO5-1 (invited) Heating and Current Drive Systems for Eu Demo: Impact of Integration Studies

E. Surrey¹, Q. Tran², T. Franke³, J. Noterdaeme⁴, J. Jelonnek⁵, M. Kalsey¹, P. Sonato⁶, A. Simonin⁷

¹Strategy & Technology Division, Culham Centre for Fusion Energy, Abingdon, Oxon, United Kingdom

²EPFL, Lausanne, Switzerland

³Power Plant Physics & Technology, EUROfusion PMU, Garching, Germany

⁴IPP, Garching, Germany

⁵KIT, Karlsruhe, Germany

⁶Conorzio RFX, Padua, Italy

⁷IRFM, Cadarache, France

13:20 SO5-2 (invited) Status of Heating and Current Drive Systems Planned for ITER

M. J. Singh

ITER Organisation, Saint Paul Lez Durance, France

13:40 SO5-3 Development of Robust and Multi-Mode Control of Tearing in DIII-D

A. S. Welander¹, R. J. La Haye¹, D. A. Humphreys¹, E. Kolemen², F. Volpe³

¹General Atomics, P.O. Box 85608, San Diego, California, USA, San Diego, CA, United States

²Princeton University, Princeton, NJ, United States

³Columbia University, New York, New York

14:00 SO5-4 Physics and Engineering Issues Associated with Increasing Beam Energy on the DIII-D Neutral Beam System

B. J. Crowley¹, J. Rauch¹, S. K. Sharma², B. Choksi², J. T. Scoville¹

¹DIII-D National Fusion Facility, General Atomics, San Diego, CA, United States

²Institute for Plasma Research, Bhat, Gandhinagar, India

14:20 SO5-5 ECRH Assisted Plasma Experiments on Tokamaks Aditya and SST-1

B. K. Shukla, D. Bora, R. Jha, S. Pradhan

Institute for Plasma Research, Gandhinagar (Gujarat), India

14:40 SO5-6 High Power Long Pulse Tests of the IFP-CNR Dummy Load for the European ITER

Gyrotron

W. Bin¹, A. Bruschi¹, K. Takahashi², T. Aoki², F. Dell'Era¹, M. Hayashibara², R. Ikeda², D. Minelli¹, A. Nardone¹, Y. Oda², K. Sakamoto², A. Simonetto¹, N. Spinicchia¹, M. Terakado², N. Tsubota²

¹*Istituto di Fisica del Plasma - Consiglio Nazionale delle Ricerche, Milano, Italy*

²*Japan Atomic Energy Research Institute, Naka, Ibaraki, Japan*

Session SO6: Power Plants and Demo

Monday, June 1 13:00-15:00, Room 616

Session Chair: James P Blanchard, University of Wisconsin - Madison

13:00 SO6-1 (invited) Demo: the Decision Path to a Robust Concept

M. M. J. Shannon, G. Federici, M. Coleman, R. Wenninger

PPPT Department, EUROfusion Consortium, Boltzmannstr.2, Garching, 85748, Germany, Bavaria, Germany

13:20 SO6-2 (invited) Activities Towards Establishment of the Technological Bases for DEMO in Japan

Y. Sakamoto

Japan Atomic Energy Agency, Rokkasho, Japan

13:40 SO6-3 (invited) Development of the K-Demo Divertor Concept

K. Im, J. S. Park, S. Kwon

DEMO Technology Division, National Fusion Research Institute, Daejeon, South Korea

14:00 SO6-4 Development and Validation of the System Analysis Program for Parameters Optimization and Economic Assessment of Fusion Reactor (syscode)

D. Chen, Y. Hou, W. Duan, J. Jiang, M. Ni, Y. Wu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China

14:20 SO6-5 Integral Study of IFE Power Plant Based on Direct Drive and Non-Protected Chamber (HiPER)

J. M. Perlado¹, R. Gonzalez-Arrabal¹, A. Rivera¹, E. del Rio¹, C. Guerrero¹, N. Gordillo¹, O. Y. Pena¹, C. Gonzalez¹, D. Cereceda¹, R. Juarez², M. Panizo¹, A. Prada¹, A. Rodriguez-Paramo¹, G. Valles¹, P. Diaz¹, F. Sordo¹, C. Sanchez², J. Sanz², M. Velarde¹

¹*Instituto Fusion Nuclear, Universidad Politecnica Madrid, Madrid, Spain*

²*Departamento Ingenieria-a Energica, ETSII, UNED, Madrid, Spain*

14:40 SO6-6 Development of the Pulsed Fission Fusion (puff) Deep Space Propulsion System

R. Adams¹, J. Cassibry², G. Statham¹, P. Giddens²

¹*NASA, MSFC, AL, United States*

²*UAH, Huntsville, AL, United States*

Session SO7: Magnets I

Monday, June 1 15:30-17:30, Salon J

Session Chair: Kevin Freudenberg, ORNL

15:30 SO7-1 (invited) R&D Effort for ITER Central Solenoid

N. N. Martovetsky¹, D. K. Irick², R. P. Reed³, W. T. Reiersen⁴, J. P. Smith⁵

¹*LLNL/ORNL, Oak Ridge, TN, United States*

²*Department of Mechanical, Aerospace and Biomedical Engineering, University of Tennessee Knoxville, Knoxville, TN, United States*

³*Cryogenic Materials Inc, Boulder, CO, United States*

⁴*PPPL/ORNL, Oak Ridge, TN, United States*

⁵*General Atomics, San Diego, CA, United States*

15:50 SO7-2 (invited) Status of the JT-60SA Magnet System

S. Davis¹, P. Barabaschi¹, A. Cucchiario², P. Decool³, E. Di Pietro¹, G. Disset⁴, L. Genini⁴, N. Hajnal¹, J. -L. Marechal³, Y. Koide⁵, G. Polli², P. Rossi², K. Tsuchiya⁵, V. Tomarchio¹, M. Verrecchia¹, M. Wanner¹, K. Yoshida⁵, L. Zani³, A. Torre³, H. Murakami⁵, K. Kizu⁵

¹*Fusion for Energy, Garching, Germany*

²*ENEA, Frascati, Italy*

³CEA-IRFM, St Paul lez Durance, France

⁴CEA-IRFU, Gif sur Yvette, France

⁵JAEA, Naka, Japan

16:10 SO7-3 (invited) NSTX-U Center Stack Fabrication

S. Raftopoulos, J. Chrzanowski, P. Titus, M. Mardenfeld, L. Dudek, P. Heitzenroeder, H. Schneider, G. Grow, M. Styer, M. Anderson, E. Perry, S. Jurczynski, E. Kearns, R. Carnevale
Engineering Department, Princeton Plasma Physics Laboratory, Princeton, NJ, United States

16:30 SO7-4 (invited) Status of Design and Manufacturing of the ITER Central Solenoid and Correction Coils

P. Libeyre¹, C. Cormany¹, N. Dolgetta¹, E. Gaxiola¹, C. Lyraud¹, W. Reiersen², D. Everitt², N. Martovetsky², P. Rosenblad², M. Cole², K. Freudenberg², J. Smith³, H. Li⁴, J. Wei⁵, L. Wang⁵, X. Yu⁵, X. Dong⁵, J. Xin⁵, C. Li⁵, W. Zheng⁵, C. Fang⁵

¹DIP/TKM/Magnet, ITER Organization, Saint Paul lez Durance, France

²U.S. ITER Project Office, Oak Ridge, TN, USA

³General Atomics, Poway, CA, USA

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

⁵ASIPP, Hefei, China

16:50 SO7-5 (invited) Manufacturing of the ITER Central Solenoid Modules

J. J. Spitzer, A. B. Stephens, K. M. Schaubel, J. P. Smith, N. S. Norausky, K. K. Khumthong, A. Gattuso
General Atomics, Poway, United States

17:10 SO7-6 Design and Test of ITER 10 kA HTSCL Prototype

T. Zhou¹, K. Lu¹, K. Ding¹, Q. Ran¹, Y. Song¹, P. Bauer², A. Devred²

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

²Magnets, ITER Organization, Cadarache, France

Session SO8: Project Management and Systems Engineering

Monday, June 1 15:30-17:30, Salon K

Session Chair: Harry Bailey, Oak Ridge National Laboratory

15:30 SO8-1 (invited) Mission Accomplished! The Role of Systems Engineering & Integration in the International Space Station Program

M. L. Uhran

Oak Ridge National Laboratory, Oak Ridge, TN, USA

15:50 SO8-2 (invited) Building the Spallation Neutron Source - a Lesson in Integration

I. S. Anderson

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

16:10 SO8-3 (invited) Lessons Learned from Implementation of System Maturity Evaluation: a Global and Integrated Approach to Design Maturity

C. Baylard, I. Kuehn, S. Orlandi, S. Chiocchio, D. Lioce, M. Olcese

ITER, Saint Paul Lez Durance, France

16:30 SO8-4 (invited) Configuration Management

I. Kuehn, C. Baylard, S. Chiocchio, J. J. Cordier, M. Kotamaki, L. Patisson, J. Reich

ITER, St. Paul lez Durance, France

16:50 SO8-5 Concurrent Construction on Evolving Design: ITER-India Experience and Lessons for Future

S. P. Deshpande, I. Bndyopadhyay, U. K. Baruah, A. K. Bhardwaj, A. K. Chakraborty, A. Kumar, V. Kumar, A. Mukherjee, S. B. Padasalagi, H. A. Pathak, S. L. Rao, B. Sarkar

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

17:10 SO8-6 Lessons Learned During the Procurement of the ITER Steady State Electrical Network Components by the US Domestic Agency

C. Neumeier¹, J. Dellas¹, J. Hourtoule², S. Nair³, A. Das⁴

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

²ITER Organization, St. Paul lez Durance, France

³Institute for Plasma Research, Gandhinagar, Gujarat, India

⁴AECOM, Princeton, NJ, USA

Session SO9: Fabrication and Materials

Monday, June 1 15:30-17:30, Room 616

Session Chair: Irving J Zatz, Princeton Plasma Physics Laboratory

15:30 SO9-1 Integral Tolerance Assessment on TF Coil Cases on the Basis of Manufacturing Input

J. Reich, J. -J. Cordier, A. Foussat, F. -J. Fuentes

PSE/PEI, ITER Organization, St. Paul Lez Durance, France

15:50 SO9-2 Mechanical Arrangement for Assembly of Iws Blocks to Iiter Vacuum Vessel

G. S. Phull¹, H. Pathak¹, J. Raval²

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

²*VV Ports and Thermal Shield Section, ITER Organization, Cadarache, France*

16:10 SO9-3 Fabrication of Vacuum Vessel with Detachable Top Lid Configuration for Indian Test Facility (INTF)

J. Joshi¹, A. Yadav¹, D. K. Singh¹, H. Patel¹, M. Girish², M. Khan², C. Rotti¹, M. Bandyopadhyay¹, A. Chakraborty¹

¹*Diagnostic Neutral Beam, ITER-India, Institute For Plasma Research, Gandhinagar, Gujarat, India, Gujarat, India*

²*Vacuum Techniques Pvt. Ltd, Peenya Industrial Area, Bengaluru-560058 (India), Karnataka, India*

16:30 SO9-4 Innovation and Implementation of Welding Processes for ITER Cryostat

V. N. Joshi¹, M. R. Patel¹, R. Prajapati¹, A. Bhardwaj¹, G. Gupta¹, A. Bhattachary¹, J. Bhavsar¹, A. Palaliya¹, M. Jindal¹, M. Pandey¹, S. Jha¹, G. Jogi¹, H. Desai², J. Jose², J. Dutt², V. More¹

¹*Cryostat & VVPSS, ITER-India, Institute for Plasma Research, Dept. of Atomic Energy, Gandhinagar, Gujarat, India*

²*Heavy Engineering, Larsen & Toubro Limited, Hazira, Surat, India*

16:50 SO9-5 Chemical Compatibility of Eurofer Steel with Sodium-Potassium NaK-78 Eutectic Alloy

A. AbouSena¹, F. Arbeiter¹, S. Baumgaertner², T. Boettcher¹, A. Heinzel³, H. Piecha⁴, K. Zinn¹

¹*Institute for Neutron Physics and Reactor Technology (INR), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

²*Institute for Applied Materials - Applied Materials Physics (IAM-AWP), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

³*Institute for Pulsed Power and Microwave Technology (IHM), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

⁴*Institute for Nuclear and Energy Technologies (IKET), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany*

17:10 SO9-6 Wetting of Lithium and Tin on Nanostructured Surfaces for First Wall Components

M. Szott, K. Kalathiparambil, P. R. Fiflis, I. Shchelkanov, D. N. Ruzic

University of Illinois, Urbana, IL, United States

Session SX2: Plenary-2

Tuesday, June 2 08:00-09:30, Salons J & K

Session Chair: Wayne R Meier, LLNL

8:00 SX2-1 Announcements and Opening Remarks II

M. Tillack¹, J. P. Allain²

¹*UC San Diego, La Jolla, CA, United States*

²*University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, United States*

8:10 SX2-2 (invited) Preliminary Design, R&D Planning and Roadmap for K-Demo

G. -S. Lee¹, Y. S. Hwang², J. H. Han², H. C. Kim¹, K. H. Im¹, K. Kim¹

¹*National Fusion Research Institute, Daejeon, South Korea*

²*Seoul National University, Seoul, South Korea*

8:50 SX2-3 (invited) Chinese Program on CFETR

J. Li, Y. Wan

ASIPP, Hefei, Anhui, China

Session SO10: Experimental Devices II

Tuesday, June 2 10:00-12:00, Salon J

Session Chair: Jonathan Menard, Princeton Plasma Physics Laboratory

10:00 SO10-1 (invited) Design and Subsystems Tests for the TPM-1U Tokamak

M. Nieto-Perez, G. Ramos, D. Hernandez-Arriaga, F. Ceballos-Soto, M. Lindero-Hernandez, D. M. Ventura-Ovalle
CICATA Queretaro, Instituto Politecnico Nacional, Queretaro, Mexico

10:20 SO10-2 (invited) KSTAR Program for Closing Gaps to Fusion Energy

Y. S. Bae¹, S. W. Yoon¹, J. Y. Kim¹, J. G. Kwak¹, H. Park^{1,2}, H. L. Yang¹, W. Namkung³, E. M. Choi², Y. S. Na⁴,
S. H. Jeong⁵, R. Prater⁶, D. Humphreys⁶, R. Ellis⁷, J. Hosea⁷, D. Mueller⁷, S. A. Sabbagh⁸, J. M. Park⁹,
K. Sakamoto¹⁰, M. Hanada¹⁰, R. Parker¹¹, P. Bonoli¹¹, T. Hoang¹²

¹*National Fusion Research Institute, Daejeon, South Korea*

²*UNIST, Ulsan, South Korea*

³*POSTECH, Pohang, South Korea*

⁴*Seoul National University, Seoul, South Korea*

⁵*Korea Atomic Energy Research Institute, Daejeon, South Korea*

⁶*General Atomics, San Diego, CA, USA*

⁷*Princeton Plasma Physics Laboratory, Princeton, NJ, USA*

⁸*Columbia University, New York, NY, USA*

⁹*Oak Ridge National Laboratory, Oak Ridge, TN, USA*

¹⁰*Japan Atomic Energy Agency, Ibaraki-ken, Japan*

¹¹*Massachusetts Institute of Technology, Cambridge, MA, USA*

¹²*Institute for Magnetic Fusion Research, CEA, Cadarache, France*

10:40 SO10-3 (invited) Alcator C-Mod and ADX: Research on the High-Field Pathway to Fusion Energy

B. LaBombard

MIT Plasma Science and Fusion Center, Cambridge, MA, United States

11:00 SO10-4 (invited) DIII-D Program for Closing Gaps to Fusion Energy

C. M. Greenfield

General Atomics, San Diego, CA, United States

11:20 SO10-5 Status and Prospect of East Engineering Systems for Advanced Operation Scenarios

Y. Song, B. Wan, P. Fu, J. Li, Y. Wan, B. Xiao, Y. Zhao, C. Hu, G. Gao, L. Hu, X. Gong, L. Xu, Y. Huang, X. Gao,
Y. Sun, F. Liu, K. Lu, X. Wang, J. Hu, J. Shan, Q. Yang, J. Zheng, Z. Chen

Institute of plasma physics, Chinese academy of sciences, Hefei, Anhui, China

11:40 SO10-6 (invited) Numerical Modelling at the Transition from W7-X Construction to Operation

V. Bykov, J. Fellingner, F. Schauer, A. Carls, M. KÄppen, P. van Eeten, T. Andreeva, H. -S. Bosch

Max-Planck-Institut für Plasmaphysik, Greifswald, Germany

Session SO11: Instrumentation and Control

Tuesday, June 2 10:00-12:00, Salon K

Session Chair: David R Terry, MIT Plasma Science and Fusion Center

10:00 SO11-1 (invited) Development Environment for Tokamak Plasma Control

M. L. Walker¹, D. A. Humphreys¹, B. Sammuli¹, A. S. Welander¹, A. Winter², J. Snipes², P. de Vries²,
G. Ambrosino³, G. De Tommasi³, M. Mattei⁴, G. Neu⁵, W. Treutter⁵, G. Raupp⁵, C. Rapson⁵

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

²*ITER Organization, Cedex, France*

³*CREATE/Universita di Napoli Federico II, Naples, Italy*

⁴*CREATE/Seconda Universita di Napoli, Napoli, Italy*

⁵*Max Planck Institute for Plasmaphysik, Garching, Germany*

10:20 SO11-2 Data Archiving Software Implementation in ITERâ€™s CODAC Core System

R. Castro¹, L. Abadie², Y. Makushok³, P. Makijarvi², J. Vega¹, M. Ruiz⁴, D. Sanz⁴, S. Simrock², J. Faig⁵, G. Roman-Perez³

¹*CIEMAT National Fusion Laboratory, Madrid, Spain*

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

³*SGENIA, Madrid, Spain*

⁴*Instrumentation and Applied Acoustic Research Group, Technical University of Madrid, Madrid, Spain*

⁵*Control Systems, INDRA Sistemas, S.A., Madrid, Spain*

10:40 SO11-3 NSTX-U Digital Coil Protection System Integration with Existing Plasma Control System

K. G. Erickson, S. P. Gerhardt, J. E. Lawson, H. Schneider, P. Sichta, T. Stevenson, G. J. Tchilinguirian
Plasma Physics Lab, Princeton University, Princeton, NJ, United States

11:00 SO11-4 (invited) Status of TIP, LFSR, WAVS Diagnostic Designs for ITER

T. N. Carlstrom

General Atomics, San Diego, CA, United States

11:20 SO11-5 (invited) Development of a Hot Source for in-Situ Calibration of the ITER Electron Cyclotron Emission Diagnostic

W. L. Rowan¹, M. E. Austin¹, J. H. Beno², R. F. Ellis³, R. E. Feder⁴, S. Houshmandyar¹, A. E. Hubbard⁵,
D. W. Johnson⁴, A. Ouroua², P. E. Phillips¹, C. Roman⁴, G. Taylor⁴

¹*Institute for Fusion Studies, The University of Texas at Austin, Austin, TX, United States*

²*Center for Electromechanics, The University of Texas at Austin, Austin, TX, United States*

³*The University of Maryland, College Park, MD, United States*

⁴*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

⁵*PSFC, Massachusetts Institute of Technology, Cambridge, MA, United States*

11:40 SO11-6 Talbot-Lau X-Ray Density Diagnostic for High Energy Density Plasmas

M. P. Valdivia, D. Stutman, M. Finkenthal

Physics and Astronomy, Johns Hopkins University, Baltimore, United States

Session SO12: Fusion Safety

Tuesday, June 2 10:00-12:00, Room 616

Session Chair: satoshi konishi, institute of advanced energy, kyoto university

10:00 SO12-1 Safety and Licensing of Nuclear Facilities for Fusion

N. P. Taylor

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

10:20 SO12-2 Methodology for Accident Analyses of Fusion Breeder Blankets

D. Panayotov¹, A. Grief², B. J. Merrill³, P. W. Humrickhouse³, M. Trow², M. Dillistone², J. T. Murgatroyd²,
S. Owen², Y. Poitevin¹, K. Peers², A. Lyons², A. Heaton², R. Scott²

¹*Fusion for Energy, Barcelona, Spain*

²*Amec Foster Wheeler, Knutsford, United Kingdom*

³*Idaho National Laboratory, Idaho Falls, ID, United States*

10:40 SO12-3 Effect of Temperature on Lead Lithium-Water Reaction

D. Zhou

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China

11:00 SO12-4 Progress in Thermohydraulic Analysis of Accident Scenarios of a Water-Cooled Fusion Demo Reactor

M. Nakamura¹, K. Watanabe², T. Araki², K. Tobita¹, Y. Someya¹, H. Tanigawa¹, H. Utoh¹, Y. Sakamoto¹,
T. Kunugi³, T. Yokomine³, S. Asano², K. Asano², W. Gulden⁴

¹*Japan Atomic Energy Agency, Rokkasho, Aomori, Japan*

²*Toshiba Corporation, Yokohama, Kanagawa, Japan*

³*Kyoto University, Kyoto, Kyoto, Japan*

⁴*Fusion for Energy, Garching, Germany, Japan*

11:20 SO12-5 Development of Virtual Reality-Based Simulation System for Nuclear and Radiation Safety and Its Application

T. He, L. Q. Hu, P. C. Long, J. Song, L. M. Shang, S. H. Zhou, Q. Yang, J. B. Zhao, S. Zhang, Z. H. Yang,
X. Cheng, T. Li, S. P. Yu, L. J. Hao, Y. C. Wu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, China Academy of Science, Hefei, Anhui, China

11:40 SO12-6 Development of a Particle Resuspension Model for a Rarified Gas Flow

Z. Xu¹, T. Jordan¹, W. Breitung²

¹*Institute for Nuclear and Energy Technologies, Karlsruhe Institute of Technology, Karlsruhe, Germany*

²*simaps GmbH, Jockgrim, Germany*

Session SP1: Chambers, Blankets and Shields

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Patrick Lorenzetto, Fusion for Energy

SP1-1 Design Optimization Using Kriging Metamodel for the ITER Thermal Shield Support

C. H. Noh^{1,2}, J. M. Lim², B. C. Lee²

¹National Fusion Research Institute, Daejeon, South Korea

²Korea Advanced Institute of Science and Technology, Daejeon, South Korea

SP1-2 Experimental Study of the Impact of Design Modifications on MHD Pressure Losses in a HCLL Blanket Mock-Up

L. Buehler, C. Mistrangelo

Karlsruhe Institute of Technology, Karlsruhe, Germany

SP1-3 Considerations about 2D and 3D Validation Cases for MHD Flow Analysis

C. Mistrangelo¹, L. Buehler¹, S. Smolentsev²

¹Karlsruhe Institute of Technology, Karlsruhe, Germany

²University of California Los Angeles, Los Angeles, USA

SP1-4 Experimental Test-Section for the Analysis of 3D MHD Phenomena in Pipes

C. Koehly, L. Buehler, C. Mistrangelo, H. -J. Brinkmann

Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

SP1-5 Conceptual Design for the Structure of CN HCCB TBM with 1X4 Configuration

Z. Zhao, Q. Wang, Q. Cao, K. Feng, X. Wang, G. Zhang

Fusion Reactor & Materials Division, Southwestern Institute of Physics, Chengdu, Sichuan, China

SP1-6 Development of Neutronics Model for the K-Demo Water Cooled Ceramic Breeder Blanket with MCNP Code

J. Park, S. Kwon, K. Im

DEMO technology division, National Fusion Research Institute (NFRI), Daejeon, South Korea

SP1-7 Thermal-Hydraulic Analysis for Conceptual Design of Korean HCCR TBM-set

D. W. Lee¹, H. G. Jin¹, E. H. Lee¹, S. K. Kim¹, J. S. Yoon¹, K. I. Shin², S. Cho³

¹Fusion Engineering Development Department, Korea Atomic Energy Research Institute, Daejeon, South Korea

²Gentec Co., Daejeon, South Korea

³National Fusion Research Institute, Daejeon, South Korea

SP1-8 Thermo-Mechanical Analysis for Conceptual Design of Korean HCCR TBM-set

D. W. Lee¹, H. G. Jin¹, E. H. Lee¹, S. K. Kim¹, J. S. Yoon¹, K. I. Shin², S. Cho³

¹Korea Atomic Energy Research Institute, Daejeon, South Korea

²Gentec Co., Daejeon, South Korea

³National Fusion Research Institute, Daejeon, South Korea

SP1-9 Corrosion Test Using Arara in the Experimental Loop for Liquid Breeder

J. S. Yoon¹, Y. I. Jung¹, D. W. Lee¹, S. K. Kim¹, H. G. Jin¹, E. H. Lee¹, H. G. Lee²

¹Korea Atomic Energy Research Institute, Daejeon, South Korea

²National Fusion Research Institute, Daejeon, South Korea

SP1-10 Electromagnetic and Thermal Analysis for Blanket Model of Fusion Reactor

S. Liu^{1,2}, M. Lei¹, M. Lu¹, K. Pei¹, C. Feng¹

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

²School of Engineering, Anhui Agricultural University, Hefei, China

SP1-11 ITER Vacuum Vessel Thermal Shield Additional Neutron Shielding

W. R. Hicks III¹, N. Her¹, C. Hamlyn-Harris², C. -H. Choi¹, C. Sborchia¹, K. -P. Weiss³

¹TOKAMAK/VVTS, ITER, St Paul Lez Durance, France

²Culham Centre for Fusion Energy, Abingdon, United Kingdom

³ITEP, KARLSRUHE INSTITUTE OF TECHNOLOGY, Eggenstein-Leopoldshafen, Germany

SP1-12 Adaptation of General Purpose CFD Code for Fusion MHD Applications

A. Khodak

PPPL, Princeton, NJ, United States

SP1-13 Calculation Accuracy Comparison of Turbulence Models for Helium-Cooled Blanket Simulation

H. Deng^{1,2,3}, W. Wang^{2,3}, D. Chen³, J. Han³

¹University of Science and Technology of China, Hefei, Anhui, China

²Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, Anhui, China

³New Star Institute of Applied Technology, Hefei, Anhui, China

SP1-14 A Numerical Method of Heat Transfer for the Magnetohydrodynamic Flow in Rectangular Ducts at High Hartmann Number

J. Han¹, W. Wang¹, S. Huang², H. Deng¹, R. Wang¹

¹New Star Institute of Applied Technology, Hefei, Anhui, China

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

SP1-15 Transient Thermal Safety Analysis of the Helium Cooled Solid Breeder Blanket for CFETR

H. Chen, M. Li, Q. Liu, G. Zhou, S. Wang

University of Science and Technology of China, Hefei, China

SP1-16 Performance Test of a Helium Circulator for the Helium Cooling System of the HCCR-TBS

E. H. Lee¹, S. -K. Kim¹, J. S. Yoon¹, H. G. Jin¹, D. W. Lee¹, S. -W. Lee², S. Cho³

¹Korea Atomic Energy Research Institute, Daejeon, Rep. of Korea

²Jinsol Turbo Machinery Co., Ltd, Daejeon, Rep. of Korea

³National Fusion Research Institute, Daejeon, Rep. of Korea

SP1-17 ITER Blanket Shield Block Collaborative Design Within ENOVIA Database

S. Wu¹, W. Kang²

¹China International Nuclear Fusion Energy Program Execution Center, MOST, P.R. China, Beijing, China

²Southwestern Institute of Physics, Chengdu, Sichuan, China

SP1-18 Conceptual Design of a Molten Salt Blanket for CFETR

M. Lei, S. Liu, Y. Song, M. Yin

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

Session SP2: Diagnostics, Data Acquisition and Control

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

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

SP2-19 Prediction of HL-2A CXRS Performance by Using Simulation of Spectra Code and Advanced Real Experimental Test for the Design of ITER CXRS System

J. Wu, L. M. Yao

school of physical electronics, university of electronic science and technology of china, Chengdu, China

SP2-20 Thermal Protection of Iter Diagnostic Equipment in the Port Plug Interspace

W. Wang¹, A. Basile¹, R. Feder¹, Y. Zhai¹, J. Guirao², N. Casal²

¹Princeton Plasma Physics Lab, New Jersey, United States

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

SP2-21 Measurement of Plasma Centroid Position on ISTTOK Using Cleaned Magnetic Signals

O. Kudlacek^{1,2}, B. B. Carvalho³, H. Figueiredo³, H. Fernandes³, G. Marchiori¹

¹Consorzio RFX, Padova, Italy

²University of Padova, Padova, Italy

³Instituto de Plasmas e Fusao Nuclear, Instituto Superior Tecnico, Universidade de Lisboa, Lisboa, Portugal

SP2-22 Development of Readout Electronics for Nio1 Thermocouples

M. Brombin, R. Ghiraldelli, F. Molon, R. Pasqualotto, N. Pomaro, G. Serianni

Consorzio RFX (CNR, ENEA, INFN, Universita' di Padova, Acciaierie Venete SpA), Padua, Italy

SP2-23 Use of Labview Flexrio Platform in Digital Nuclear Radiation Spectroscopy: Architecture and First Laboratory Results

M. Riva, B. Esposito, D. Marocco, F. Belli

FUSION, ENEA FRASCATI, Frascati, Italy

SP2-24 Reconstruction Method of MHD Equilibrium from Two Kinds of Magnetic Sensors

K. Nakamura¹, M. M. Alam², F. Xia³, O. Mitarai⁴, K. Kurihara⁵, Y. Kawamata⁵, M. Sueoka⁵, M. Takechi⁵,

M. Hasegawa¹, K. Tokunaga¹, K. Araki¹, H. Zushi¹, K. Hanada¹, A. Fujisawa¹, H. Idei¹, Y. Nagashima¹,

S. Kawasaki¹, H. Nakashima¹, A. Higashijima¹, A. Fukuyama⁶

¹Research Institute for Applied Mechanics, Kyushu University, Kasuga, Japan

²Interdisciplinary Graduate School of Engineering Sciences, Kasuga, Japan

³Southwestern Institute of Physics, Chengdu, China

⁴*Tokai University, Kumamoto, Japan*

⁵*JAEA, Naka, Japan*

⁶*Kyoto University, Kyoto, Japan*

SP2-25 Current Density Calculation from Particle Orbit in RF-Driven Divertor Plasma on QUEST

M. M. Alam

IGSES, Kyushu University, Fukuoka, Japan

SP2-26 Effects of Mechanical Loads on ITER Xracs-Survey Sight-Tube

S. Kumar¹, S. Varshney¹, K. Bhatt¹, N. Bhaliya¹, S. Padasalagi¹, S. Mishra¹, P. V. Subhash¹, V. Kumar¹, R. Barnsley², P. Bernascolle², J. -M. Drevon²

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²*DIAGNOSTICS, ITER-Organization, 13067 St. Paul-Lez-Durance, FRANCE*

SP2-27 The NSTX-U Digital Coil Protection System AutoTester

G. N. Zimmer, J. Dong, R. E. Hatcher

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

SP2-28 Artificial Neural Networks for Analysis of Magnetic Measurement Database on East Tokamak

B. Wang¹, B. Xiao^{1,2}, J. Li^{1,2}, Z. Luo², Y. Guo²

¹*School of nuclear science and technology, University of Science and Technology of China, Hefei, China*

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SP2-29 Beam Emission Spectroscopy Diagnostic Based on Neutral Beam in East Tokamak

Y. Yu¹, M. Ye¹, R. Chen², B. Lyu², H. Wang¹, Y. Hou¹, S. Feng¹, Y. Shi¹, B. Wan^{1,2}

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²*Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, Anhui, China*

SP2-30 Instrumentation and Control System Architecture for SST-1 Neutral Beam Injector

L. K. Bansal

Institute for Plasma research, Gandhinagar, Gujarat, India

SP2-31 Progress in the Design of the In-Vessel Magnetic Pick-Up Coils for ITER

S. Peruzzo¹, M. Brombin¹, M. Furno Palumbo¹, W. Gonzalez¹, N. Marconato¹, A. Rizzolo¹, S. Arshad², Y. Ma³, G. Vayakis³

¹*Consorzio RFX, Padova, Italy*

²*Fusion for Energy, Barcelona, Spain*

³*ITER Organization, St Paul Lez Durance, France*

SP2-32 In Situ Testing of EHT Integrators on a Tokamak

K. E. Miller, T. Ziemba, J. Prager, I. Slobodov, J. Carscadden

Eagle Harbor Technologies, Inc., Seattle, WA, United States

SP2-33 Design and Development of Millimeter Wave Band Pass Filter

P. K. Atrey^{1,2}, D. Pujara², S. Mukherjee¹

¹*Institute for Plasma Research, Gandhinagar, India*

²*Institute of Technology, Nirma University, Ahmedabad, India*

SP2-34 Design and Operation of a Fast Gas Valve for Disruption Mitigation Studies on NSTX-U

R. Raman, G. J. Plunkett, W. -S. Lay

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

SP2-35 Securing MDSplus for the NSTX-U Digital Coil Protection System

G. J. Tchilinguirian, K. G. Erickson

CODAC, PPPL, Princeton, NJ, United States

SP2-36 A Proposal for the Demonstration of the ITER Remote Experimentation Centre with Collaborating European Tokamaks

G. De Tommasi¹, J. Farthing², E. Joffrin³, K. Hirota⁴, V. Vitale⁵, S. Clement⁶, N. Nakajima⁷, O. Takahisa⁸, F. Sartori⁶

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³*CEA, St-Paul-Lez-Durance, France*

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⁸*Japan Atomic Energy Agency, Rokkasho, Japan*

Session SP3: Experimental Devices

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Ali Ahmed AbouSena, Karlsruhe Institute of Technology (KIT)

SP3-37 The Plasma Poloidal Magnetic Energy Transfer During the Plasma Disruptions in Joint-Text Tokamak

M. Zhang^{1,2}, J. Zhang^{1,2}, B. Rao^{1,2}

¹State Key Laboratory of Advanced Electromagnetic Engineering and Technology, Wuhan, China

²Huazhong University of Science and Technology, Wuhan, China

SP3-38 Metrology Support of Flux Surface Diagnostic Installation

T. Braeuer, J. Mueller, M. Otte, A. John

Max-Planck-Institut fuer Plasmaphysik Greifswald, Greifswald, Germany

SP3-39 Power Systems Analysis and Design for ADX

D. R. Terry, J. Irby, W. Cochran, S. Wolfe, B. LaBombard, W. Burke, R. Vieira

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

SP3-40 Structural Analysis of High-Field-Side Rf Antennas During a Disruption on the Advanced Divertor Experiment (ADX)

J. Doody, B. LaBombard, R. Leccacorvi, S. Shiraiwa, R. Vieira, G. M. Wallace, S. J. Wukitch, J. H. Irby

Plasma Science Fusion Center at MIT, Cambridge, MA, United States

SP3-41 Novel Vacuum Vessel & Coil System Design for the Advanced Divertor Experiment (ADX)

R. F. Vieira, J. Doody, W. K. Beck, L. Zhou, R. Leccacorvi, B. LaBombard, R. S. Granetz, S. M. Wolfe,

J. H. Irby, S. J. Wukitch, D. R. Terry, G. M. Wallace, R. R. Parker

Plasma Science Fusion Center, MIT, Cambridge, MA, United States

SP3-42 High Field Side Launch of Lower Hybrid Waves: a Scoping Study for ADX

G. M. Wallace, S. Shiraiwa, S. G. Baek, P. T. Bonoli, A. D. Kanojia, P. Koert, B. L. LaBombard, R. Leccacorvi,

R. R. Parker, D. R. Terry, R. Vieira, S. J. Wukitch

MIT PSFC, Cambridge, MA, United States

SP3-43 Implementation of Stellarator of Costa Rica 1 (SCR-1)

V. I. Vargas, J. Mora, C. Otarola, E. Zamora, J. Asenjo, A. Mora, E. Villalobos

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

SP3-44 Lithium Granular Injector Operational Experience Triggering Elms in H-Mode on DIII-D

A. Nagy¹, A. Bortolon¹, E. P. Gilson¹, R. Lunsford¹, R. Maingi¹, D. K. Mainsfield¹, L. Roquemore¹,

C. P. Chrobak², G. L. Jackson²

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SP3-45 Low Aspect Ratio Tokamak with Plasma Centre-Post

C. Ribeiro

Plasma Laboratory, CICANUM, School of Physics, University of Costa Rica, San Jose, Costa Rica

SP3-46 Status of the Hybrid Illinois Device for Research and Applications (HIDRA)

D. E. Andruczyk, D. N. Ruzic, J. P. Allain, D. Curreli

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

Session SP4: Fabrication, Assembly and Maintenance

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Ali Ahmed AbouSena, Karlsruhe Institute of Technology (KIT)

SP4-47 Updated of Alignment and Measurement for EAST in-Vessel Components

S. Qin, Y. Song, K. Lu, J. Wei

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

SP4-48 Study on Dimensional Metrology of EAST Vacuum Vessel Internal Components

C. Liu, Y. Gu, J. Ge, Y. Zheng, K. Lu, J. Wei, Q. Zhang

Tokamak Design Division, Institute of Plasma Physics Chinese Academy of Sciences, He Fei, China

SP4-49 Manufacturing and Assembly of IWS Support Rib and Lower Bracket for ITER Vacuum Vessel

R. Laad¹, Y. Sarvaiya¹, H. A. Pathak¹, J. R. Raval², C. H. Choi², P. Suresh³

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SP4-50 Simulation and Validation of the Remote Handling Refurbishment Process for the European IFMIF Target Assembly Concept Design

G. Micciche¹, G. Di Gironimo², F. Frascati¹, R. Mozzillo², L. Lorenzelli¹

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SP4-51 Application of Reliability-Centred Maintenance (rcm) in Design and Plan of Maintenance for Fusion Reactor

Z. Gong¹, S. Qin², Y. Song²

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²Tokamak Design Division, Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, Anhui, China

SP4-52 Research and Development on Metallic Seals for Neutral Beam Injectors Vessels

J. Graceffa¹, D. Boilson¹, M. Urbani¹, J. Chareyre¹, K. Roux¹, C. H. Choi¹, V. Pilard², G. Agarici², R. Shuff², M. Van Uffelen², C. Abbes³, T. Bornarel³, R. Gillier³, F. Ledrappier⁴

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³Technetics group, Saint Etienne, France

⁴Technetics group, Pierrelatte, France

SP4-53 Visual Inspection and Motion Control for In Vessel Tile Servoing Tasks in a Tokamak Vessel

V. B. Nair¹, S. Madhusmita², S. J Dr²

¹Electrical Engineering, Institute for Plasma Research, Ahmedabad, India

²Mechanical Engineering, National Institute of Technology, Rourkela, India

SP4-54 Fabrication of the NSTX-U Center Stack Casing Assembly

I. J. Zatz¹, J. Chrzanowski¹, P. Titus¹, A. Brooks¹, T. Martinez²

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²Martinez & Turek, Inc., Rialto, CA, United States

SP4-55 Maintenance Strategy Assessment of CFETR Divertor Remote Handling System

W. Zhao¹, Y. Song^{1,2}, H. Wu³, Y. Cheng¹, Y. Li¹

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Session SP5: Materials

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Ali Ahmed AbouSena, Karlsruhe Institute of Technology (KIT)

SP5-56 Characterization of the Defects in Oxide Dispersion-Strengthened Iron Alloy After Helium Ion Irradiation

P. Gao^{1,2}, X. Ju¹, Y. Xin¹, Q. Cao¹, Z. Guo³, L. Guo⁴, B. Wang⁵

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⁴Accelerator Laboratories, School of Physics, Wuhan University, Wuhan, China

⁵Key Laboratory of Nuclear Analysis Techniques, Institute of High Energy Physics, Chinese Academy of Sciences, Beijing, China

SP5-57 Numerical Simulation of Free Surface Behavior in windowless Spallation Target of ADS

D. Cheng

Army officers academy, hefei, China

SP5-58 Thermophysical Properties of Low-Activation Oxide-Dispersion-Strengthened Ferritic Steels

T. Nagasaka¹, T. Tanaka¹, T. Muroga¹, A. Sagara¹, A. Kimura², S. Ukai³, T. Nozawa⁴, K. Ozawa⁴

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³*Graduate School of Engineering, Hokkaido University, Sapporo 060-8628, Japan*

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SP5-59 Thermal Analysis of the Start-up Transient of IFMIF Target Assembly Prototype with Bayonet Backplate

D. Bernardi¹, P. Arena², G. Bongiovi², P. A. Di Maio², G. Micciche¹, L. Richiusa²

¹*ENEA Brasimone, Camugnano (BO), Italy*

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

SP5-60 Redesign of Hydrogen Isotope Permeability Measurement Device for Silicon-Carbide and Evaluation of Minimum Detection Flows in High Temperature

Y. Yamamoto¹, Y. Murakami¹, D. Yonetsu¹, S. Konishi²

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

SP5-61 Residual Stress Formation in Tungsten to Copper Brazed Joint with Eutectic Gold-Copper Brazing Alloy

D. Easton, J. Wood, A. Galloway, Y. Zhang, M. Olsson Robbie

Mechanical and Aerospace Engineering, University of Strathclyde, Glasgow, Glasgow, United Kingdom

SP5-62 Defect Influence on Grain Boundary Strength in RAFM Steels: a Molecular Dynamics Simulation

J. Y. Shi^{1,2}, F. Gao², L. Peng¹, M. Y. Ye¹

¹*School of Nuclear Science and Technology, University of Science and Technology of China, Hefei, Anhui, China*

²*Department of Nuclear Engineering and Radiological Sciences, University of Michigan, Ann Arbor, MI, USA*

SP5-63 Materials Development for IFE Systems at the Institute of Nuclear Fusion

J. M. Perlado¹, R. Gonzalez-Arrabal¹, A. Rivera¹, N. Gordillo¹, C. Guerrero¹, O. Y. Pena¹, E. delRio¹, D. Cereceda¹, C. Gonzalez¹, M. Panizo¹, A. Prada¹, A. Rodriguez-Paramo¹, G. Valles¹, P. Diaz¹, I. Fernandez², A. Wennberg²

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Session SP6: Next Steps and Power Plants

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Shishir P Deshpande, Institute for Plasma Research

SP6-64 Electromagnetic Fast Transients Simulation Methodology for Fusion Power Plant Design

V. Cocilovo¹, G. Ramogida²

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²*UTFUS TECS, ENEA, Frascati, Italy*

SP6-65 The Engineering Design of ARC: A Compact, High Field, Fusion Nuclear Science Facility and Demonstration Power Plant

B. N. Sorbom, J. Ball, T. R. Palmer, F. J. Mangiarotti, J. M. Sierchio, P. Bonoli, C. Kasten, D. Sutherland, H. S. Barnard, C. B. Haakonsen, J. Goh, C. Sung, D. G. Whyte

Plasma Science and Fusion Center, MIT, Cambridge, MA, United States

SP6-66 Petawatt laser pulses for proton-boron high gain fusion without problem of nuclear radiation for economic power generation

G. H. Miley¹, H. Hora², P. Lalouis³, S. Moustazis⁴, S. Eliezer⁵

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²*University of New South Wales, Sydney, Australia*

³*FORTH Greek Research Foundation, Heraklion, Crete, Greece*

⁴*Technical University of Crete, Chania, Crete, Greece*

⁵*SOREQ Research Centre, Yavne, Israel*

SP6-67 Shear-Flow Stabilized Z-Pinch Reactor Conceptual Design

H. S. McLean¹, U. Shumlak², B. A. Nelson², R. P. Golingo², A. Schmidt¹

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

²*University of Washington, Seattle, WA, United States*

SP6-68 Self-Consistent Steady-State Simulation of CFETR with an OMFIT-Based Integrated Modeling Platform

W. Guo

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

SP6-69 Initial Studies of the Divertor Dome Effect on Detachment Onset in DEMO

C. Day, Y. Igitchkanov, S. Varoutis, C. Gleason-Gonzalez, V. Hauer

Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

SP6-70 Computer Simulation of Laser-Target Interaction in Magneto-Inertial Fusion

S. V. Ryzhkov, V. V. Kuzenov

Thermal Physics Department, Bauman Moscow State Technical University (BMSTU), Moscow, Russian Federation

Session SP7: Safety and Tritium Engineering

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Shishir P Deshpande, Institute for Plasma Research

SP7-71 Analysis on Ex-Vessel Loss of Coolant Accident for a Water-Cooled Fusion Demo Reactor

K. Watanabe¹, M. Nakamura², T. Araki¹, K. Tobita², Y. Someya², H. Tanigawa², H. Utoh², Y. Sakamoto², S. Asano¹, K. Asano¹

¹*Toshiba Corporation, Yokohama, Kanagawa, Japan*

²*Japan Atomic Energy Agency, Rokkasho, Aomori, Japan*

SP7-72 Multiscale Integral Analysis of Tritium Leakages in Nuclear Power Plants

M. Velarde¹, J. Fradera²

¹*Nuclear Engineering, Member of Institute of Nuclear Fusion, Madrid, Spain*

²*IDOM nuclear services, Barcelona, Spain*

SP7-73 Reliability and Maintainability Data for Liquid Metal Cooling Systems

L. C. Cadwallader

Idaho National Laboratory, Idaho Falls, Idaho, United States

SP7-74 Development and Experimental Evaluation of a Prototype of the ITER TF Safety Quench Detection System

Y. O. Kim¹, H. Yonekawa¹, Y. Chu¹, K. R. Park¹, S. J. Lee², A. Devred², Y. M. Kim³

¹*National Fusion Research Institute, Daejeon, South Korea*

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

³*Chungnam National University, Daejeon, South Korea*

SP7-75 Energy Processing System for Disposing Plasma Electromagnetic Energy During Disruption in Tokamak

X. L. Li

School of electrical and electronic engineering, State Key Laboratory of Advanced Electromagnetic Engine: Huazhong University of Science and Technol, Wuhan, China

SP7-76 Heat Release Assessment on Conceptual Design of HCCR-TBS

H. G. Jin

Nuclear Fusion Engineering Development Department, KAERI, Daejeon, South Korea

SP7-77 Dehydriding Performances of a Medium-Scale DU Bed

D. Koo¹, J. Park¹, S. -H. Yun², S. Paek¹, D. -H. Ahn¹, H. Chung¹

¹*Fuel Cycle Process Technology Development, Korea Atomic Energy Research Institute, Daejeon, Republic of Korea*

²*Tritium SDS Team, National Fusion Research Institute, Daejeon, Republic of Korea*

SP7-78 Design Optimization of a Hydrogen Sensor for ITER Pb16Li Blankets

M. Zucchetti¹, I. Nicolotti¹, M. Utili², L. Candido¹

¹*DENERG, Politecnico di Torino, Torino, Italy*

²*UTIS, ENEA, Brasimone, Italy*

Session SP8: Systems Engineering and Project Management

Poster Session

Tuesday, June 2 13:30-15:30, Salons A & B

Session Chair: Shishir P Deshpande, Institute for Plasma Research

SP8-79 ITER Cryostat Structural Analysis

G. Vitupier, C. Sborchia, I. Sekachev, M. Meekins, C. Zhou, H. Xie, O. Tailhardat
Tokamak directorate / Vessel division, ITER ORGANIZATION, St Paul lez Durance, France

SP8-80 The Design of the Nuclear HVAC of IFMIF

G. Pruneri

Accelerator Group, IFMIF/EVEDA (Inter'l Fusion Material Irradiation facility/Eng. Validat. and Eng. Design Activities), Rokkasho-mura, Japan

SP8-81 A Software Ecosystem for the Integrative Design of W7-X

S. Renard¹, A. Holtz², C. Baylard³, M. Banduch², D. Hartmann²

¹*Institute for Magnetic Fusion Research (IRFM), Alternative Energies and Atomic Energy Commission (CEA), Saint Paul lez Durance, France*

²*Sub division Design and Configuration, Max Planck Institute for Plasma Physics, Greifswald, Germany*

³*Configuration Control Division, ITER Organization, Saint Paul lez Durance, France*

SP8-82 Preliminary Design and Verification of Divertor Module for CFETR System Code

J. Zhang¹, Y. Song^{2,1}, M. Ye^{1,2}, S. Wu^{1,2}, X. Peng², Z. Wang², S. Mao¹

¹*School of Nuclear Science and Technology, USTC, Hefei, China*

²*Tokamak Design Division, ASIPP, Hefei, China*

SP8-83 The Integration Platform Development of System Code for CFETR Using Java, Mysql and OPTIMUS

S. Wang¹, M. Ye^{1,2}, Z. Wang², S. Mao¹, K. Xu¹

¹*School of Nuclear Science and Technology, University of Science and Technology of China, Hefei, Anhui, China*

²*Institute of Plasma Physics Chinese Academy of Sciences, Hefei, Anhui, China*

SP8-84 Critical Chain and Its Control in the Schedule Management of ITER Feeder Procurement

Y. Xing

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

SP8-85 Main Portal Code of the CFETR System Code

Z. W. Wang

Tokamak design division, Institute of Plasma Physics, Chinese Academy of Science, Hefei, China

Session SO13: Power Supply Systems

Tuesday, June 2 15:30-17:30, Salon J

Session Chair: Charles L Neumeyer, Princeton Plasma Physics Laboratory

15:30 SO13-1 (invited) NSTX Upgrade Power Supply System

W. Que, C. Neumeyer, S. Ramakrishnan, J. Lawson, R. Mozulay, X. Zhao, H. Schneider
Princeton Plasma Physics Laboratory, Princeton, NJ, United States

15:50 SO13-2 (invited) ITER PF Converter System Progress

P. Fu^{1,2}, G. Gao¹, Z. Song¹

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

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

16:10 SO13-3 (invited) Wendelstein 7-X Magnet Power Supplies: Overview and Status of Commissioning

T. Rummel¹, T. Moennich¹, F. Fuellenbach¹, T. Murray²

¹*Max-Planck-Institut für Plasmaphysik, Greifswald, Germany*

²*Applied Power Systems, Inc., Hicksville, N.Y., U.S.A.*

16:30 SO13-4 (invited) Performance and Design Definition of the West Tokamak Divertor Coils Power Supplies

H. Dougnac¹, N. Dumas¹, P. Garibaldi¹, A. Santagiustina¹, J. Scheiber¹, E. Nardon¹, R. Nouailletas¹,

F. Saint Laurent¹, S. Bremond¹, P. Moreau¹, Y. Wang², L. Yao², Y. Wang², X. Liu²

¹*IRFM/SCCP/GIDEA, CEA, Cadarache, France*

²*SWIP, Chengdu, China*

16:50 SO13-5 (invited) Si-SiC Based Switching Power Amplifier for MHD Modes Control in Fusion Experiments

E. Gaio¹, A. Ferro¹, L. Novello², M. Matsukawa³

¹*Consorzio RFX, Padova, Italy*

²*Fusion for Energy, Garching, Germany*

³*JAEA Naka Fusion Institute, Mukouyama, Naka-si, Ibarakiken, Japan*

17:10 SO13-6 (invited) R&D Progress of 1 MV Power Supply System for ITER

K. Watanabe, M. Kashiwagi, H. Yamanaka, T. Maejima, Y. Terunuma, H. Tobari, M. Dairaku, M. Hanada

Department of ITER project, Japan Atomic Energy Agency Naka Institute, Naka-city, Japan

17:30 SO13-7 (invited) Advancement on the Procurement of Power Supply Systems for JT-60SA

L. Novello¹, O. Baulaigue², A. Coletti¹, N. Dumas², A. Ferro³, E. Gaio³, A. Lampasi⁴, A. Maistrello³,

M. Matsukawa⁵, K. Shimada⁵, K. Yamauchi⁵, P. Zito⁴

¹*Fusion for Energy, Garching, Germany*

²*IRFM, CEA, Saint-Paul-lez-Durance, France*

³*Consorzio RFX, Padova, Italy*

⁴*ENEA, Frascati, Italy*

⁵*JAEA, Naka, Japan*

Session SO14: PMI and Plasma Edge Physics

Tuesday, June 2 13:30-15:30, Salon K

Session Chair: Dennis Whyte, MIT

13:30 SO14-1 (invited) Effects of Helium in Plasma Exposed Surfaces

M. J. Baldwin¹, T. J. Petty², R. P. Doerner¹, J. W. Bradley²

¹*Center for Energy Research, University of California at San Diego, La Jolla, CA, United States*

²*Department of Electrical Engineering and Electronics, University of Liverpool, Liverpool, United Kingdom*

13:50 SO14-2 (invited) Deuterium Ion Retention in Clean and Oxidized Lithium Films

J. P. Roszell¹, A. M. Capece², B. E. Koel¹

¹*Department of Chemical and Biological Engineering, Princeton University, Princeton, NJ, United States*

²*Princeton Plasma Physics Lab, Plainsboro, NJ, United States*

14:10 SO14-3 (invited) Contribution of Linear Plasma Devices in PMI Research

N. Ohno

Graduate school of Engineering, Nagoya University, Nagoya, Aichi 464-8603, Japan

14:30 SO14-4 Time-Resolved Observation of Tungsten Nanostructuring Due to Helium Plasma

P. R. Fiffis, D. Curreli, D. N. Ruzic

University of Illinois, Urbana, IL, United States

14:50 SO14-5 In Situ Elastic Recoil Detection Analysis of Tungsten and Molybdenum Surfaces During Iter-like Helium Irradiation

K. B. Woller, D. G. Whyte, G. M. Wright

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

15:10 SO14-6 Models and Simulation for Divertor Erosion Following Plasma Disruption in Tokamak Reactors

N. M. Almousa, J. G. Gilligan, M. A. Bourham

Nuclear Engineering, North Carolina State University, Raleigh, NC, United States

Session SO15: Next Step Devices and Technologies

Tuesday, June 2 15:30-17:30, Room 616

Session Chair: Mark M J Shannon, Euro Fusion, Culham Centre for Fusion Energy

15:30 SO15-1 (invited) The Material Plasma Exposure Experiment MPEX: Pre-Design, Development and Testing of Source Concept

J. Rapp

Oak Ridge National Laboratory, Oak Ridge, United States

15:50 SO15-2 (invited) Operating Condition to Sustain Burning Plasma in Stellarator/Heliotron-Type Fusion Reactor Looking Beyond LHD

R. Sakamoto, H. Yamada

National Institute for Fusion Science, Toki, Gifu, Japan

16:10 SO15-3 Development of System Code for CFETR Design

M. Ye¹, S. Wang¹, Z. Wang², S. Mao¹, X. Liu², V. Chan¹

¹*School of Nuclear Science and Technology, University of Science and Technology of China, Hefei, China*

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

16:30 SO15-4 R&D Progress of Gas Dynamic Trap Fusion Neutron Source

Y. Wu, H. Du, C. Lian, D. Chen, M. Ni, M. Wang, J. Jiang

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China

16:50 SO15-5 (invited) RF Enabling Technologies for Reactor Relevant Devices

S. J. Wukitch, P. T. Bonoli, Y. Lin, G. Wallace, S. Shiraiwa, S. G. Baek, R. R. Parker, W. M. Beck, R. Vieira

MIT PSFC, Cambridge, MA, United States

17:10 SO15-6 Wide Bandgap Switching Devices for Fusion Reactor Power Supply Systems

M. J. Scott, J. Wang

Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH, United States

Session SX3: Plenary-3

Wednesday, June 3 08:00-09:30, Salons J & K

Session Chair: Dennis L Youchison, Sandia National Laboratories

8:00 SX3-1 Announcements and Opening Remarks III

M. Tillack¹, J. P. Allain²

¹*UC San Diego, La Jolla, CA, United States*

²*University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, United States*

8:10 SX3-2 (invited) Plasma Physics Input to Tokamak PFC Design

R. A. Pitts

Plasma Operation, ITER Organization, St. Paul Lez Durance, France

8:50 SX3-3 (invited) Multiscale Computational Modeling and Materials Research for Next-Step Devices after ITER

B. D. Wirth

Nuclear Engineering, University of Tennessee, Knoxville, TN, USA

Session SO16: Magnets II

Wednesday, June 3 10:00-12:05, Salon J

Session Chair: Peter H Titus, Princeton Plasma Physics Laboratory

10:00 SO16-1 Optimization Design and Mechanical Analysis of CFETR CS Model Coil

X. Liu, Z. Wang, X. Wang

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

10:20 SO16-2 Manufacturing Assessment of the First Half of the Italian Supply of JT-60sa TF Coil Winding Pack

G. M. Polli¹, A. Cucchiario¹, G. Drago², F. Terzi², E. Di Pietro³, V. Tomarchio³

¹*UTFUS, ENEA, Frascati, Italy*

²*ASG Superconductors, Genova, Italy*

³*BA, Fusion for Energy, Garching, Germany*

10:40 SO16-3 First Italian JT-60sa TF Coil Winding Pack Insertion into Casing

A. Cucchiario¹, G. M. Polli¹, P. Rossi¹, G. Drago², F. Terzi², E. Di Pietro³, V. Tomarchio³

¹*UTFUS, ENEA, Frascati, Italy*

²*ASG Superconductors, Genova, Italy*

³*BA, Fusion for Energy, Garching, Germany*

11:00 SO16-4 Test of the ITER TF CFT Prototype

H. Wu¹, K. Lu¹, Y. Song¹, C. Liu¹, Z. Wang¹, E. Niu², N. Clayton³, C. -Y. Gung³

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

²*China International Nuclear Fusion Energy Program Execution Center, Beijing, China*

³ITER Organization, St Paul-lez-Durance Cedex, France

11:20 SO16-5 Tensile Strain Mitigation During the NSTX-U Ohmic Heating (OH) Coil Cooldown

P. H. Titus¹, A. Brooks¹, N. Atnafu¹, H. Zhang¹, A. Khodak¹, P. Fabian²

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

²Composite Technology Development, Lafayette, CO, United States

11:40 SO16-6 Maximizing Stress-Limited Toroidal Magnetic Field in a Low Aspect Ratio Tokamak DT Fusion Reactor

R. D. Woolley

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

Session SO17: First Wall, Blanket and Divertor I

Wednesday, June 3 10:00-12:00, Salon K

Session Chair: Minyou Ye, School of Nuclear Science and Technology, University of Science and Technology of China

10:00 SO17-1 (invited) Overview of DCLL Research Activities in the EU/Spain

D. Rapisarda¹, I. Fernandez², I. Palermo¹, E. Mas de les Valls³, C. Moreno¹, M. Gonzalez¹, A. Ibarra¹

¹Fusion National Laboratory, CIEMAT, Madrid, Spain

²Fundación UNED, Madrid, Spain

³BarcelonaTECH, Barcelona, Spain

10:20 SO17-2 Design and R&D Activities of Fusion Breeder Blankets in China

J. Yu, Z. Chen, M. Ni, S. Liu, Z. Zhu, J. Jiang, Q. Huang, Y. Wu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, 230031, China

10:40 SO17-3 The System Design of Tritium Extraction from Ceramic Breeder Material with H₂O Added in Helium Purge Gas

Y. Yao, D. Luo, R. Xiong, Y. Yu, J. Song

JiangYou, Material Institute of China Academy of Engineering Physics, MianYang, China

11:00 SO17-4 Development and Experimental Validation of Super Monte Carlo Simulation Program for Fusion Applications

J. Song, L. Hao, H. Zheng, M. Chen, S. Yu, T. He, J. Zou, P. Long, L. Hu, T. Li, Y. Wang, G. Song, C. Liu, J. Jiang, Y. Wu

Institute of Nuclear Energy Safety Technology, CAS, Hefei, Anhui, China

11:20 SO17-5 Neutronics Evaluation of Lithium-Based Ternary Alloys in IFE Blankets

A. Jolodovsky¹, M. Fratoni¹, W. Meier², J. Demuth², S. Reyes², P. Turchi²

¹UC Berkeley, Berkeley, CA, United States

²Lawrence Livermore National Lab, Livermore, CA, United States

Session SO18: Disruption Mitigation and Control

Wednesday, June 3 10:00-12:00, Room 616

Session Chair: yuntao song, institute of plasma physics, Chinese academy of sciences

10:00 SO18-1 (invited) Detection, Control and Mitigation of Disruptions on ITER

M. Lehnen¹, P. B. Aleynikov¹, S. Maruyama¹, P. C. de Vries¹, ITPA collaborators

¹ITER Organization, 13067 St Paul Lez Durance Cedex, France

10:20 SO18-2 (invited) Disruption Precursor Detection: Combining the Time and Frequency Domains

J. Vega^{1,2}, A. Murari^{1,3}, S. Dormido-canto⁴, R. Moreno^{1,2}, A. Pereira^{1,2}, G. A. Ratta^{1,2}, J. ET Contributors⁵

¹JET, EUROfusion Consortium, Abingdon, UK

²FUSION, CIEMAT, Madrid, Spain

³CONSORZIO RFX, Padova, Italy

⁴Dept. INFORMATICA y AUTOMATICA, UNED, Madrid, Spain

⁵Proceedings of the 25th IAEA Fusion Energy Conference 2014, Appendix of F. Romanelli et al., Saint Petersburg, Russia

10:40 SO18-3 (invited) Pellet Injection Technology and Applications on ITER

L. R. Baylor¹, S. K. Combs¹, R. C. Duckworth¹, M. S. Lytle¹, S. J. Meitner¹, D. A. Rasmussen¹, S. Maruyama²

¹ORNL, Oak Ridge, TN, United States

²ITER Organization, Saint Paul lez Durance, France

11:00 SO18-4 (invited) Results of Disruption Mitigation Experiments on DIII-D

N. Commaux

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

11:20 SO18-5 (invited) ITER Disruption Mitigation Technologies and Beyond

S. Maruyama¹, G. Kiss¹, F. Villers¹, Y. Yang¹, M. Lehnen¹, L. R. Baylor², M. S. Lyttle², S. J. Meitner², D. A. Rasmussen²

¹ITER Organization, St Paul Lez Durance, France

²ORNL, Oak Ridge, TN, USA

11:40 SO18-6 Recent Developments in Support of the Shattered Pellet Technique for Disruption Mitigation

S. K. Combs¹, S. J. Meitner¹, T. E. Gebhart², L. R. Baylor¹, C. R. Foust¹, T. T. Ha¹, M. S. Lyttle¹

¹Fusion & Materials for Nuclear Systems, Oak Ridge National Laboratory, Oak Ridge, TN, United States

²Nuclear Engineering Program, University of Florida, Gainesville. FL, United States

Session SO19: Inertial Fusion

Wednesday, June 3 13:30-15:30, Salon J

Session Chair: J. Manuel Perlado, Instituto Fusion Nuclear / Universidad Politecnica Madrid

13:30 SO19-1 (invited) MagnIFico: a System for High-Field Magnetized Inertial Fusion at the National Ignition Facility

M. A. Rhodes, L. J. Perkins, B. G. Logan

Lawrence Livermore National Laboratory, Livermore, CA, United States

13:50 SO19-2 (invited) Magnetized Inertial Fusion Research at the Shiva Star Facility

J. H. Degnan¹, C. Grabowski¹, M. Domonkos¹, E. L. Ruden¹, D. J. Amdahl¹, M. H. Frese², S. D. Frese², G. A. Wurden³

¹Directed Energy Directorate, Air Force Research Laboratory, Kirtland AFB, NM, USA

²NumerEx LLC, Albuquerque, NM, USA

³Los Alamos National Laboratory, Los Alamos, NM, USA

14:10 SO19-3 (invited) Magnetized Liner Inertial Fusion Experiments on the Z Pulsed Power Accelerator

P. F. Knapp

Sandia National Laboratories, Albuquerque, NM, USA

14:30 SO19-4 (invited) Experiments on Liner Dynamics and Magnetic Flux Compression for MagLIF

R. D. McBride, K. J. Peterson, T. J. Awe, D. B. Sinars, M. R. Gomez, S. B. Hansen, C. A. Jennings, S. A. Slutz, M. R. Martin, R. W. Lemke, D. E. Bliss, P. F. Knapp, P. F. Schmit, D. C. Rovang, M. E. Cuneo

Sandia National Laboratories, Albuquerque, New Mexico, United States

14:50 SO19-5 Conceptual Design of Large Pulsed Power Driver for Z-FFR

M. Wang, L. Zhou

Institute of Fluid Physics, CAEP, Mianyang, Sichuan, China

15:10 SO19-6 Geometry Optimization for Quasi-Spherical Wire-Array Implosion Based on a Multi-Element Method

Y. Y. Chu, Z. H. Li, J. L. Yang

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

Session SO20: Heating and Current Drive II

Wednesday, June 3 15:30-17:30, Salon K

Session Chair: Elizabeth Surrey, Culham Centre for Fusion Energy

15:30 SO20-1 Development of a Helicon Current Drive System for Installation in the DIII-D Tokamak

J. F. Tooker, M. Hansink, C. P. Moeller, C. J. Murphy, R. Prater

General Atomics, San Diego, CA, United States

15:50 SO20-2 RF, Disruption and Thermal Analyses of East Antennas

L. Zhou¹, W. K. Beck¹, P. Koert¹, Q. X. Yang², C. M. Qin², X. J. Zhang², J. Doody¹, R. F. Vieira¹, S. J. Wukitch¹, R. S. Granetz¹, J. H. Irby¹, Y. P. Zhao²

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

²*Institute of Plasma Physics, Chinese Academy of Sciences, Hefei, Anhui, P.R. China*

16:10 SO20-3 Advanced ICRF Antenna for ADX

S. J. Wukitch, P. T. Bonoli, Y. Lin, W. M. Beck, R. Vieira

MIT PSFC, Cambridge, MA, United States

16:30 SO20-4 The Indian Test Facility (INTF) for Neutral Beams, a Status Update

A. K. Chakraborty¹, U. K. Baruah¹, M. Bandyopadhyay¹, G. Bansal², J. Bhagora¹, M. Bhuyan¹, A. Gahlaut², J. Joshi¹, K. Joshi¹, V. Mahesh², H. Mistry², M. V. Nagaraju¹, R. Pandey², K. Pandya², D. Parmar¹, K. G. Parmar², H. Patel¹, M. Patel¹, K. Patel², S. Pillai¹, B. Prajapati², G. Roopesh¹, C. Rotti¹, S. Shah¹, D. Sharma², H. Shishangiya¹, D. Singh¹, N. P. Singh¹, J. Soni², D. Sudhir¹, H. Tyagi¹, M. Vishnudev¹, A. Yadav¹, R. Yadav¹

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

²*Negative ion Neutral Beams, Institute for Plasma Research, Gandhinagar, India*

16:50 SO20-5 Manufacturing Experience of Beam Dump for Spider Facility

H. Patel¹, C. Rotti¹, M. V. Nagaraju¹, A. Chakraborty¹, B. Schunke², J. Chareyre², D. Boilson², L. Svensson², M. Dalla Palma³, P. Zaccaria³, P. Roberto³, E. Pfaff⁴, J. Schafer⁴, C. Eckardt⁴

¹*Department of Atomic Energy, ITER-India, Institute for Plasma Research, Gandhinagar, Gujarat, India*

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

³*Consorzio RFX, Padova, Italy*

⁴*PVA TePla AG, Wetztenberg, Germany*

17:10 SO20-6 Status of Diagnostics Development & Integration in Indian Test Facility (intf) for Iter-Dnb (diagnostic Neutral Beam)

D. S. Kumar¹, M. Bandhopadhyay¹, M. Bhuyan¹, J. Soni², H. Tyagi¹, S. Pillai¹, J. Joshi¹, A. Yadav¹, C. M. Rotti¹, D. Sharma², R. Yadav¹, J. Bhagora¹, R. Pandey², D. Parmar¹, H. Patel¹, V. Nagaraju¹, D. Singh¹, M. Patel¹, G. Bansal², K. Pandya², A. Chakraborty¹

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

²*Institute for Plasma research, Gandhinagar, Gujarat, India*

Session SO21: First Wall, Blanket and Divertor II

Wednesday, June 3 13:30-15:30, Room 616

Session Chair: David Rapisarda, CIEMAT

13:30 SO21-1 Measurement and Analysis on Flow Rate of PbLi in Dragon-IV Loop

Z. Zhu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Ch, Hefei, Anhui, China

13:50 SO21-2 Superficial Layer MHD Effect and Full-Cover Free Surface Flow Characterization

Z. Xu, C. Pan, X. Zhang, K. Liu, L. Peng

Fusion Ractor & Materials, Southwestern Institute of Physics, Chengdu, China

14:10 SO21-3 Concept Study and Experiment Design of Liquid First Wall Basing on Nano-Fluid Pbli Breeder

M. Ni, S. Zhang, Z. Meng, C. Liang, D. Chen, C. Lian, J. Jiang, Y. Wu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China

14:30 SO21-4 Code Validation and Experimental Plan for Mhd Buoyancy Analysis in Fusion Liquid Metal Blankets

Z. Meng^{1,2}, M. Ni¹, T. Zhou¹, Z. Zhu¹, J. Jiang¹

¹*Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China*

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

14:50 SO21-5 Tritium Permeation and Retention Analysis in the First Wall of Water Cooled Ceramic Breeder Blanket for CFETR

K. Huang, S. Liu, G. Luo, D. Lao

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

15:10 SO21-6 Design, Manufacturing and Testing of Pd-Membranes and Membrane Reactors for Detritiation Processes

S. Tosti, A. Santucci, M. Incelli, F. Borgognoni

ENEA, Frascati (RM), Italy

Session SP9: Magnets

Poster Session

Wednesday, June 3 15:30-17:30, Salons A & B

Session Chair: Matthew J Baldwin, University of California at San Diego

SP9-1 Research and Design of KTX Magnet System

J. Zheng¹, Y. Song¹, Q. Yang¹, W. Liu², W. Ding², S. Wan², H. Li², L. Yang¹, H. Xu¹, S. U. -D. Khan¹

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

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

SP9-2 High Radiation Designs for Magnets in DT Fusion Reactors

R. D. Woolley

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

SP9-3 Active Compensation of Noises in the Quench Detection for the KSTAR CS Magnet

Y. Chu

National Fusion Research Institute, Daejeon, South Korea

SP9-4 An Investigation of Fluctuation in the KSTAR Cryo-Circuits

H. -J. Lee, J. J. Joo, N. W. Kim, K. M. Moon, D. S. Park, H. L. Yang

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

SP9-5 Overview of Analysis Results on ITER ELM Coils

C. H. Jun, A. Encheva, V. Albin, C. Choi, R. LeBarbier, J. -M. Martinez, C. Sborchia

Tokamak, ITER International Organization, Saint Paul les Durance, France

SP9-6 Mechanical Behavior of the KSTAR Central Solenoid Preloading Structure According to the Coil Current

H. K. Kim, H. T. Kim, Y. O. Kim, H. L. Yang, K. R. Park, K. M. Kim, S. H. Park, J. H. Song, Y. K. Oh

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SP9-7 4C Code Analysis of Quench Propagation in a Toroidal Field Coil of Demo

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SP9-8 Real-Time High-Field Measurement of Joint Resistance in the Alcator C-Mod Toroidal Field Magnet

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Session SP10: Plasma Fueling, Exhaust and Vacuum

Poster Session

Wednesday, June 3 15:30-17:30, Salons A & B

Session Chair: Matthew J Baldwin, University of California at San Diego

SP10-9 The Shoelace Antenna: a Device for Inductively Coupling to Low Frequency, Short Wavelength Fluctuations in the Plasma Boundary

T. Golfinopoulos, W. M. Burke, B. LaBombard, R. R. Parker, W. C. Parkin, P. P. Woskov

MIT Plasma Science and Fusion Center, Cambridge, MA, United States

SP10-10 Leak Localization on the ITER Main Vacuums

L. B. Worth, R. J. Pearce, A. Antipenkov

ITER Organization, Route de Vinon sur Verdon 13115 St Paul Lez Durance, France

SP10-11 Preliminary Design of ITER Cryopumps Front-End Cryodistribution System Instrumentation and Controls

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SP10-12 Pellet Selector and Flight Tube Trajectory Development for ITER Fueling, ELM Pacing, and Impurity Pellets

S. J. Meitner, L. R. Baylor, S. K. Combs, C. R. Foust, T. T. Ha, K. G. Logan, T. P. Bjorholm, M. S. Lyttle

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

SP10-13 Fast Acting Eddy Current Driven Valve for Massive Gas Injection on ITER

M. Lyttle¹, L. Baylor¹, J. Carmichael¹, M. Ericson¹, N. D. Bull-Ezell¹, P. Fisher¹, S. Meitner¹, J. Wilgen¹, S. Maruyama², G. Kiss²

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SP10-14 Investigation of the Impact of Sub-Divertor Neutral Gas Dynamics on Particle Exhaust

S. Varoutis, C. Gleason-Gonzalez, Y. Igitkhanov, C. Day

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

SP10-15 Operation Space of Divertor Detachment in DEMO

Y. Igitkhanov, C. Day, S. Varoutisa, C. Gleason-Gonzalez, V. Hauer

ITEP, KARLSRUHE INSTITUTE OF TECHNOLOGY, Eggenstein-Leopoldshafen, Germany

SP10-16 Indian Single Pellet Injection System for Plasma Fuelling Studies

R. Gangradey, J. S. Mishra, S. Mukherjee, P. Panchal, P. Nayak, P. Bairagi, H. Sharma, H. Patel, P. Dutta, N. Rastogi, J. Agarwal

Pumping & Fuelling Division, Institute for Plasma Research, Bhat, Gandhinagar, India

SP10-17 Indigenously Developed Large Pumping Speed Cryoadsorption Cryopump

R. Gangradey¹, S. Mukherjee¹, J. Agarwal¹, M. Stephen¹, P. Panchal¹, P. Nayak¹, S. Kasthuriengan², S. Udgata³, V. S. Tripathi³, H. Patel¹, J. S. Mishra¹, V. Lambade¹, P. Bairagi¹, V. Kumar¹, R. Sayani¹

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Session SP11: Plasma-facing Components and PMI

Poster Session

Wednesday, June 3 15:30-17:30, Salons A & B

Session Chair: Arnold Lumsdaine, Oak Ridge National Laboratory

SP11-18 Thermo-mechanical Evaluation of a Water Cooled High Heat Flux Unit for the K-DEMO Divertor

S. Kwon, J. S. Park, K. Im

DEMO Technology Division, National Fusion Research Institute, Daejeon, South Korea

SP11-19 Manufacturing & High Heat Flux Testing of Tungsten Brazed Mockups in KSTAR

K. M. Kim¹, H. T. Kim¹, J. H. Song¹, H. K. Kim¹, S. H. Park¹, S. H. Hong¹, B. C. Kim¹, H. L. Yang¹, S. K. Kim², D. W. Lee²

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SP11-20 Multicriteria Selection in Concept Design of a Divertor Remote Handling Port in the EU Demo Reactor Using an AHP Participative Approach

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SP11-21 Experimental Investigation on Water-Cooled Hypervapotron Enhancement for First Wall Applications

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SP11-22 Experimental Investigation of the Hypervapotron Enhanced Heat Transfer for High Heat Flux Components

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SP11-23 Influence of Target Geometry on the Performance of a Possible Snowflake Divertor in CFETR

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SP11-24 Baking Stress Analysis and Design Optimization of EAST Tungsten Divertor

X. Peng

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

SP11-25 Current Status of Korea Heat Load Test Facility for Fusion Reactor Materials

S. -K. Kim¹, A. Jo¹, H. G. Jin¹, E. H. Lee¹, J. -S. Yoon¹, D. W. Lee¹, S. Cho²

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SP11-26 Flow Instabilities in Refractory Metal, Porous Media, Helium-Cooled Plasma Facing Components

D. L. Youchison, R. E. Nygren

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SP11-27 Characterization of a High Directed Energy Plasma Source for Plasma-Material Interaction Experiments

K. T. K. Loebner, T. C. Underwood, M. A. Cappelli

Mechanical Engineering / Thermosciences, Stanford University, Stanford, CA, United States

SP11-28 The Materials Analysis Particle Probe Upgrade (MAPP): Summary of Status and Upcoming Experiments in the National Spherical Torus Experiment Upgrade (NSTX-U)

F. Bedoya¹, J. P. Allain¹, M. Lucia², R. Kaita², D. St-Onge², R. Ellis², R. Majeski²

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SP11-29 Lithium as a Plasma Facing Component to Optimize the Edge Plasma Performance

R. Maingi, R. Majeski, J. Menard, M. Jaworski, R. Kaita

PPPL, Princeton, NJ, United States

SP11-30 Conceptual Design of Tungsten Monoblock Components for KSTAR Divertor

J. H. Song, K. M. Kim, H. T. Kim, H. K. Kim, S. H. Park, S. H. Hong, B. C. Kim, H. L. Yang

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SP11-31 Defect Dynamics of Ultra-Refined Tungsten under Helium Bombardment

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SP11-32 Plasma Modeling Through Reliable Atomic Processes

R. Srivastava

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SP11-33 Development and Verification of Computational Model for Halo Current in East

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Session SP12: Power Supplies

Poster Session

Wednesday, June 3 15:30-17:30, Salons A & B

Session Chair: Thomas Rummel, Max-Planck-Institut für Plasmaphysik

SP12-34 NSTX Toroidal Field Coil Turn to Turn Short Detection

S. Ramakrishnan, W. Que, X. Zhao, C. Neumeyer, E. Baker

Princeton Plasma Physics Laboratory, Princeton NJ, United States

SP12-35 Electromagnetic Compatibility Analysis and Design of ITER Poloidal Field Converter Unit

Y. Yang^{1,2}, M. Zhang^{1,2}, K. Yu^{1,2}, Z. Song³, L. Jiang³

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SP12-36 DC Busbars for the ITER Power Supply System: Features and Challenges

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SP12-37 R&D on Dummy Load Prototype for ITER Coil Power Supply System

C. Li^{1,2}, M. Zhang^{1,2}, K. Yu^{1,2}, X. Qin³, Z. Song⁴, P. Fu⁴

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SP12-38 Development of Super-Synchronization Speed Control Assembly for Joint-Texas Experimental Tokamak Doubly-Fed Motor

M. Zhang, Y. Xie, G. Jiang, P. Geng, K. Yu

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SP12-39 The Power Characteristic Results According to the Load Test of the Motor Generator System

D. -Y. Eom, S. -L. Hong, C. -H. Kim, S. -J. Roh, J. -D. Kong, K. -R. Park

KSTAR plant engineering team, National Fusion Research Institute, Daejeon, South Korea

SP12-40 Measurement and Analysis of Power Characteristics of MG Power System

S. L. Hong, D. Y. Eom, J. D. Kong, C. H. Kim, S. J. Roh, K. R. Park

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SP12-41 Modeling and Analysis of the Inverter Type High Voltage Power Supply with Duty Cycle Modulation

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SP12-42 The Development and Application of the All Solid-State Modulators for Auxiliary Heating on HI-2a

Q. Li, W. M. Xuan, L. Y. Yao, X. H. Mao, Y. L. Wang

power supply department, Southwestern Institute of Physics, Chengdu, China

SP12-43 Design of Varying Frequency Three-Phase Synchronous Signal Circuit Based on Dsp

W. Li, L. Yao, Y. Wang, Y. Wang, W. Xuan

Southwestern Institute of Physics, Chengdu, Sichuan, China

SP12-44 Recent High Current Plasma Discharges Operations with Booster Power Supply Assisted Vertical Magnetic Field in ADITYA Tokamak

C. Gupta, K. Shah, M. Makwana, R. Tanna, J. Ghosh

Aditya power supply, Institute for Plasma Research Bhat Gandhinagar, Gandhinagar, India

SP12-45 Installation, Commissioning and Acceptance Tests of the JT-60SA Quench Protection Circuit

A. Maistrello¹, E. Gaio¹, A. Ferro¹, F. Baldo¹, M. Perna², C. M. Panizza², S. D'Arrigo², M. Povolero², L. Novello³, M. Matsukawa⁴, K. Yamauchi⁴

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SP12-46 Continuous state space model of the ITER ac/dc converters for stability analysis of the Pulsed Power Electrical Network

C. Finotti¹, E. Gaio¹, I. Benfatto², I. Song², J. Tao²

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SP12-47 Progress in the -1 MV DC ITER Neutral Beam Power Supply

H. Decamps

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SP12-48 Progress in the Design and Procurement of the High Voltage Power Supplies for Iter Ec System

T. Gassmann¹, F. Albajar², F. Arnold³, M. Bader³, T. Bonicelli², C. Darbos¹, H. Decamps¹, K. Hayashi⁴, M. Henderson¹, K. Sakamoto⁴, D. Parmar⁵, N. Singh⁵

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SP12-49 Design of Variable-Frequency Power Supply System Based on Multilevel Inverters for Dynamic Resonant Magnetic Perturbation Coils on J-TEXT Tokamak

M. Li, Y. H. Ding, Y. Pan, B. Rao, B. Yi, H. Y. Xu

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SP12-50 Modular 200 MVA Programmable Power Supply for MST's Poloidal Field

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SP12-51 A Pfn for Toroidal Field System for Tpm-1u Tokamak

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SP12-52 Full Scale Prototype Reasearch and Development of the ITER Poloidal Field Converter Unit

Z. Q. Song¹, P. Fu¹, G. Gao¹, L. W. Xu¹, J. C. Li¹, C. Li², Y. Yang², L. Dong³, M. Wang³, T. Z. Fang³

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SP12-53 New DSP-Based Firing Generator for the PPPL AC/DC Converters

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Session SP13: Heating and Current Drive

Poster Session

Wednesday, June 3 15:30-17:30, Salons A & B

Session Chair: Mahendrajit Singh, Iter organisation

SP13-54 NSTX-U Coils Bus Bars Design and Construction

N. D. Atnafu, L. E. Dudek, A. Khodak, S. Gerhardt, S. Ramakrishna, M. Smith, P. Titus

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SP13-55 Reconstruction of the COMPASS-D ECRH Systems on the J-TEXT Tokamak

D. H. Xia, C. H. Liu, Z. J. Wang, M. Zhang, W. Zheng, L. Q. Jiang, D. L. Sun, Z. Zeng, F. T. Cui, Z. Yu,

G. Zhuang, K. X. Yu, Y. Pan

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SP13-56 Analysis of ICRF Ferrite Tuner

P. Koert, L. Zhou, S. Wukitch, A. Binus, E. Fitzgerald, A. Pfeiffer, R. Murray

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SP13-57 Challenges with Localized Plasma Rotation and Momentum Transport Analysis under Heating and Current Drive Conditions

C. Bae

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SP13-58 Power Supplies for the ITER Diagnostic Neutral Beam Injector

M. Kushwah¹, B. Schunke¹, N. P. Singh², U. K. Baruah², H. Decamps¹, L. Svensson¹, R. Hemsworth¹,

J. Chareyre¹, B. Raval², A. Patel², A. Thakar², D. Parmar², V. Gupta², D. Boilson¹

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SP13-59 Cooling Design and Analysis of the ITER EC Upper Launcher

P. Spaeh¹, G. Aiello¹, M. Gagliardi², A. Krause³, A. Meier¹, R. Nousiainen², T. Scherer¹, S. Schreck¹, D. Strauss¹,

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SP13-60 Final Design of the Beam Source for the MITICA Injector

D. Marcuzzi¹, P. Agostinetti¹, M. Dalla Palma¹, M. De Muri¹, G. Chitarin¹, G. Gambetta¹, N. Marconato¹, R. Pasqualotto¹, M. Pavei¹, N. Pilan¹, A. Rizzolo¹, G. Serianni¹, V. Toigo¹, L. Trevisan¹, M. Visentin¹, P. Zaccaria¹, M. Zaupa¹, D. Boilson², J. Graceffa², R. S. Hemsworth², C. H. Choi², M. Marti², K. Roux², M. J. Singh², A. Masiello³, M. Froeschle⁴, B. Heinemann⁴, R. Nocentini⁴, R. Riedl⁴, H. Tobar⁵, H. P. L. de Esch⁶, V. N. Muvvala⁷

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SP13-61 Engineering Design and Fabrication of the New-Type Antenna for EAST

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SP13-62 Preliminary Results of the Optimization of the Large Titanium Sublimation Pumps for the W7-X Neutral Beam Injection System

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SP13-63 On the Present Status of the EU DEMO H&CD Systems, Technology, Functions and Mix

T. Franke¹, K. Avramidis², G. Granucci³, J. Jelonnek², I. Jenkins⁴, M. Kalsey⁴, J. -M. Noterdaeme⁵, A. Simonin⁶, P. Sonato⁷, M. Q. Tran⁸

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SP13-64 Prototype High Voltage Bushing: Configuration to Its Operational Validation

S. Shah, D. Sharma, D. Parmar, H. Tyagi, A. Gahlaut, J. Soni, J. Joshi, K. Pandya, K. Joshi, M. Bandyopadhyay, C. Rotti, A. Chakraborty

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SP13-65 Indigenous Manufacturing Realization of Twin Source and Its Auxiliary Systems

R. Pandey, M. Bandyopadhyay

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SP13-66 The ITER EC H&CD Upper Launcher: Methodology in the FEM Analyses of the Diamond Window Unit Subject to Seismic and Baking Loads

G. Aiello¹, A. Vaccaro¹, A. Meier¹, M. Gagliardi², T. Scherer¹, G. Saibene², S. Schreck¹, P. Spaeh¹, D. Strauss¹, T. Goodman³, A. Krause³, F. Sanchez³

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SP13-67 Performance and Status of the Electron Cyclotron Heating System on DIII-D

M. Cengher, J. Lohr, Y. A. Gorelov, A. C. Torrezan, D. Ponce

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SP13-68 Benchmark Testing of DIII-D Neutral Beam Modeling with Water Flow Calorimetry

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SP13-69 Using Acoustic Detectors to Monitor Iter Ich Transmission Lines Arc Events

C. C. Kung¹, E. Fredd¹, N. Greenough¹, G. D'Amico¹, A. Castano¹, C. Brunkhorst¹, J. Hosea¹, R. Goulding²,
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SP13-70 Design and Manufacture of DIII-D Neutral Beam Pole Shields with Copper Plates and Molybdenum Inserts

I. J. Zatz¹, A. Khodak¹, P. Titus¹, A. Nagy¹, J. Winkleman¹, R. Nazikian¹, T. Scoville²

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SP13-71 Plasma Ohmic Discharge Simulation for CFETR by TSC

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SP13-72 A Study of Transimission Mode Conversion Miter-Bend for EC H&CD Transmission Line

Y. Oda, R. Ikeda, M. Fukunari, R. Ikeyama, K. Takahashi, K. Kajiwara, K. Sakamoto

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SP13-73 Design & Development of Electrical System for Twin Source

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SP13-74 Additive Manufacturing of Steady-State Mirrors for the KSTAR ECH Launchers

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SP13-75 CFD Analysis of Different Cooling Options for a Gyrotron Cavity

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SP13-76 A Traveling Wave Antenna for Launching High Frequency Fast Waves

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SP13-77 Matching Methods to the ITER Ion Cyclotron Heating Antenna

C. E. Deibele, D. W. Swain, R. H. Goulding, M. Mccarthy, D. A. Rasmussen

US ITER, oak ridge national laboratory, Oak Ridge TN, United States

SP13-78 Development of Prototype Elements for Beam Line Components for ITER Diagnostic Neutral Beam and Indian Test Facility

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SP13-79 Heating Neutral Beams for ITER : Present Status

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B. Schunke¹, L. Svensson¹, D. Shah¹, A. El Ouazzani¹, M. Urbani¹, H. P. L. De Esch², V. Antoni³, G. Chitarin³,
G. Serianni³, D. Marcuzzi³, V. Toigo³, P. Zaccaria³, U. Fantz⁴, P. Franzen⁴, B. Heinemann⁴, W. Kraus⁴,
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⁴*Max Planck Institute fur Plasma Physik, Garching, Germany*

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Session SX4: Plenary-4

Thursday, June 4 08:00-9:30, Salons J & K

Session Chair: Jean Paul Allain, University of Illinois at Urbana-Champaign

8:00 SX4-1 Announcements and Opening Remarks IV

M. Tillack¹, J. P. Allain²

¹UC San Diego, La Jolla, CA, United States

²University of Illinois at Urbana-Champaign, Urbana-Champaign, IL, United States

8:10 SX4-2 (invited) W7-X Commissioning: Progress and Lessons Learned for Future Devices

F. Schauer, H. -S. Bosch, T. S. Pedersen, R. Wolf

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

8:50 SX4-3 (invited) Progress on the Fusion Nuclear Science Facility Activity

C. E. Kessel¹, J. P. Blanchard², A. Davis², L. El-Guebaly², N. Ghoniem³, P. W. Humrickhouse⁴, S. Malang⁵, B. J. Merrill⁴, N. B. Morley³, G. H. Neilson¹, M. E. Rensink⁶, T. D. Rognlien⁶, A. F. Rowcliffe⁷, S. Smolentsev³, L. L. Snead⁸, M. S. Tillack⁹, P. Titus¹, L. M. Waganer¹⁰, A. Ying³, K. Young¹, Y. Zhai¹

¹Princeton Plasma Physics Laboratory, Princeton NJ, United States

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⁵Fusion Nuclear Technology Consulting, Linkenheim-Hochstetten, Germany

⁶Lawrence Livermore National Laboratory, Livermore CA, United States

⁷Retired, Oak Ridge National Laboratory, Oak Ridge TN, United States

⁸Oak Ridge National Laboratory, Oak Ridge TN, United States

⁹University of California, San Diego CA, United States

¹⁰Consultant, O'Fallen MO, United States

Session SO22: Design and Analysis Tools for Stellarator DEMO Devices

Thursday, June 4 10:00-12:00, Salon J

Session Chair: Hutch Neilson, Princeton Plasma Physics Laboratory

10:00 SO22-1 (invited) Systems Code Analysis of HELIAS Power Plants

F. Warmer¹, C. D. Beidler¹, A. Dinklage¹, Y. Feng¹, J. Geiger¹, R. Kemp², P. Knight², F. Schauer¹, S. Torrioni¹, D. Ward², R. Wolf¹

¹Max Planck Institute for Plasma Physics, Greifswald, Germany

²Culham Centre for Fusion Energy, Culham, UK

10:25 SO22-2 (invited) System Design of the Heliotron-type Reactor FFHR

T. Goto, A. Sagara

National Institute for Fusion Science, Toki, Gifu, Japan

10:50 SO22-3 (invited) Challenges for Design Models for Stellarator Divertors

O. Schmitz¹, D. T. Anderson¹, A. Bader¹, S. Boszenkhov², F. Effenberg¹, T. E. Evans³, Y. Feng², J. Geiger², H. Frerichs¹, D. Gates⁴, J. H. Harris⁵, C. Hegna¹, H. Hoelbe², K. Ida⁶, M. Kobayashi⁶, S. Lazerson⁴, J. D. Lore⁵, D. Maurer⁷, D. Reiter⁸, U. Samm⁸, T. Sunn Pedersen², Y. Suzuki⁶

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

²Max-Planck Institute for Plasma Physics, Greifswald, Germany

³General Atomics, La Jolla, CA, United States

⁴Princeton Plasma Physics Laboratory, Princeton, NJ, United States

⁵Oak Ridge National Laboratory, Oak Ridge, TN, United States

⁶National Institute for Fusion Science, Toki, Gifu, Japan

⁷Auburn University, Auburn, AL, United States

⁸Institute for Climate and Energy Research, Forschungszentrum Juelich, Juelich, Germany

11:15 SO22-4 (invited) Engineering Optimization of Stellarator Coils Lead to Improvements in Device Maintenance

T. G. Brown, N. Pomphrey, J. Breslau, A. Zolfaghari

Princeton University, Princeton, NJ, United States

11:40 SO22-5 (invited) HIDRA and the Materials Challenges for Stellarators

D. E. Andruczyk, D. N. Ruzic, J. P. Allain, D. Curreli

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

Session SO23: Plasma Facing Components

Thursday, June 4 10:00-12:00, Salon K

Session Chair: Charles E Kessel, Princeton Plasma Physics Laboratory

10:00 SO23-1 (invited) Overview of Activities for the Wendelstein 7-X Scraper Element Collaboration

A. Lumsdaine¹, T. Bjorholm¹, J. Boscary², E. Clark³, K. Ekici³, J. Fellingner⁴, J. Harris¹, H. Hoelbe⁴, D. McGinnis¹, J. Lore¹, H. Neilson⁵, P. Titus⁵, J. Tretter², G. Wurden⁶

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

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

³*University of Tennessee, Knoxville, TN, United States*

⁴*Max Planck Institute for Plasma Physics, Greifswald, Germany*

⁵*Princeton Plasma Physics Laboratory, Princeton, NJ, United States*

⁶*Los Alamos National Laboratory, Los Alamos, NM, United States*

10:20 SO23-2 (invited) High Temperature Plasma Facing Component Behavior under Extreme Conditions

J. P. Blanchard, C. J. Martin

University of Wisconsin - Madison, Madison, WI, United States

10:40 SO23-3 (invited) Heat Transport and Detachment Modeling of Advanced X-Divertors and Super X-Divertors Using SOLPS 5.1

B. M. Covele, P. Valanju, M. Kotschenreuther, S. Mahajan

Physics, University of Texas at Austin, Austin, TX, United States

11:00 SO23-4 Acceptance Tests of ITER Vertical Target Divertor Full Scale Plasma Facing Units Fabricated by HRP

E. Visca¹, D. Candura², A. Pizzuto¹, A. Reale¹, S. Roccella¹, P. Rossi¹

¹*Fusion Unit, ENEA, RM, Italy*

²*Fusion Dept, Ansaldo Nucleare S.p.A., GE, Italy*

11:20 SO23-5 Two-Phase Thermal-Fluid Analysis of the W7-X High Heat Flux Divertor Scraper Element

E. Clark¹, A. Lumsdaine², J. Boscary³, K. Ekici¹, J. Harris², D. McGinnis², J. Lore², J. Tretter³

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

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

³*Max Planck Institute for Plasma Physics, Garching, Germany*

11:40 SO23-6 Thermal Radiation Analysis to Calculate the Temperature and Heat Load of Wendelstein 7-X Test Divertor Unit, Scraper and Other Components

H. Zhang¹, P. Titus¹, J. Fellingner²

¹*Mechanical Engineering, Princeton Plasma Physics Lab, Princeton, NJ, United States*

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

Session SO24: Tritium Handling and Safety

Thursday, June 4 10:00-12:00, Room 616

Session Chair: Paul W Humrickhouse, Idaho National Laboratory

10:00 SO24-1 (invited) Overview of Research Activities at Tritium Laboratory Karlsruhe

D. Demange, U. Besserer, B. Borschein, I. Cristescu, S. Fischer, F. Priester, P. SchÄ¶fer, M. Sturm, J. Wendel, S. Welte

Institute for Technical Physics, Tritium Laboratory, Karlsruhe Institute of Technology, Karlsruhe, Germany

10:20 SO24-2 Environmental Impact of the Tritium Emission from Fusion Energy under Innovative Deployment Scenarios with Fuel Production

S. Konishi¹, K. Namba¹, S. Takeda², R. Kasada¹

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

²*Graduate School of Advanced Integrated Studies in Human Survivability, Kyoto University, Sakyoku, Kyoto, Japan*

10:40 SO24-3 Modeling Tritium Migration from the Bulk of Structural Metals into the Adsorbed Water Layers on Metal Surfaces

M. Sharpe^{1,2}, W. Shmayda¹, W. U. Schroder²

¹Laboratory for Laser Energetics, University of Rochester, Rochester, United States

²Depts. of Chemistry and Physics, University of Rochester, Rochester, United States

11:00 SO24-4 R&D of Tritium Technology for CFETR: Progress and Prospect

W. Luo, D. Luo, D. Meng, R. Li, Z. Huang

China Academy of Engineering Physics, Mianyang, China

11:20 SO24-5 Environmental Safety Assessment for Fusion Reactor Due to Gaseous Tritium Release

M. Ni, B. Nie, J. Jiang, Y. Wu

Key Laboratory of Neutronics and Radiation Safety, Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, China

11:40 SO24-6 Load Specification for ITER Tritium SDS and Seismic Analysis

W. -S. Choi

Korea Atomic Energy Research Institute, Daejeon, South Korea