ThPO-62: An Alternative Design Concept for the DNB Calorimeter Motion Mechanism 699Irfan Ahmed, IPR-ITER-India

TO5-5: Realization and Testing of Grid Prototypes for the Iter Neutral Beam Injectors 705Piero Agostinetti, Consorzio RFX

ThPO-63: Attachment of Ferrite Material Used in an Active Matching Network for LHCD on Alcator C-Mod 711

Richard Murray, MIT Plasma Science and Fusion Center Alcator CMOD

ThPO-64: Optimization of Beam Optics and Strategies for Focusing the Multi-Beamlet Accelerator of the MITICA Injector 715

Pierluigi Veltri, Consorzio RFX

ThPO-65: Operation of a Double Stub Tuner for Alcator C-Mod Lower Hybrid Current Drive System 721

Peter Koert, Plasma Science and Fusion Center - M.I.T.

ThPO-66: Radio Frequency Additional Heating Systems Issues for the Tore-Supra West Project 724

Dominique GUILHEM, CEA cadarache / IRFM

ThPO-67: The ITER Neutral Beam Vacuum Vessel Design 729

Etienne Delmas, ITER Organization

ThPO-68: Upgrades and Performance of the Electron Cyclotron Heating System on DIII-D 735 Mirela Cengher, GA

ThPO-69: Molybdenum Armour Layer on Copper Plates: Manufacturing Technologies and Tests of Prototypes 741

Mauro Pavei, Consorzio RFX, EURATOM-ENEA Association, Corso Stati Uniti 4, I-35127 Padova, Italy

ThPO-70: A New High-Efficiency Stepper Motor Driver for Old Technology Stepper Motors 747
Nevell Greenough, PPPL

ThPO-71: Beam Transport and Interactions with Beam-Line Components in MITICA Injector 751

Emanuele Sartori, Consorzio RFX - Padova

ThPO-72: Two-Stage Heating Mechanism for Plasma Fusion at 10 MK 757

Tianxi Zhang, Alabama A & M University

ThPO-74: Electrical Fault Protection System for Fusion Devices 763

GE LI, Institute of Plasma physics, Chinese Academy of Sciences

ThPO-75: A Study of Mode Conversion and Output Beam Profile in Long Distance Corrugated Waveguide Transmission Line 767

Yasuhisa Oda, Japan Atomic Energy Agency

ThPO-77: Design Status of ITER IC H&CD Plant System Control 771

Bharatkumar Arambhadiya, ITER Organization

ThPO-78: 3.7 GHz 500kW CW Klystron Operation at Full Power for SST1 LHCD System 777

Promod Sharma, Institute for Plasma Research

ThPO-79: Control of the Magnetic Field Configuration in the MITICA Neutral Beam Injector 783

Giuseppe Chitarin, University of Padova - Consorzio RFX

ThPO-80: Design of Beam Dump for Spider Facility 789

Chandramouli Rotti, IPR-ITER

ThPO-81: Development of Steady-State Mirrors for the KSTAR ECH Launchers 795

Robert Ellis, PPPL

TO5-3: Development of a Large RF Ion Source for the ITER Neutral Beam Injector: Project Overview and First Results of Elise 800

Riccardo Nocentini, Max-Planck-Institut für Plasmaphysik Garching

ThPO-82: Dynamic Rf Power Control for Diii-D Ich/fast Wave Operation 806

Chun Kung, PPPL

TO5-4: Progress of Two Rf Driver Based Negative Ion Source Experiment 810

Mainak Bandyopadhyay, IPR-ITER

ThPO-85: Commissioning of 42GHz/500kW ECRH System on Tokamak SST-1 815

Braj Shukla, Institute for Plasma Research

IFE Drivers

TPO-77: EFFICIENT IGNITION of FUSION USING PW-ps LASER PULSES for ULTRAHIGH ACCELERATION of PLASMA BLOCKS 819

Henrich Hora, University of New South Wales, Sydney

TPO-79: Petawatt Laser Driven Cluster Foils for an Intense Pulsed Neutron Source 825

George Miley, University of Illinois, UC

MFE Plasma Fueling

ThPO-86: A Method to Produce Lithium Pellets for Fueling and ELM Pacing in NSTX-U 829

Daniel Andruczyk, University of Illinois

ThPO-88: Optimization of Capillary Source Geometry for Maximum Pellet Exit Velocity in Electrothermal Plasma Launchers 834

Micah Esmond, Virginia Polytechnic Institute and State University

TO3-6: The Effects of Pellet Volume and Aspect Ratio on Fuel Pellet Exit Velocities in a Capillary Discharge Mass Accelerator 839

Leigh Winfrey, Virginia Polytechnic Institute and State University

IFE Target Fabrication and Injection

WO2-6: Bulk Modulus for Solid Molecular Tritium: Ab Inito Aproximation 845

Carlo Guerrero Contreras, Instituto de Fusión Nuclear, Universidad Politécnica de Madrid

WO2-7: Accelerated Evaporative Drying of RF Foam for Target Fabrication 849

Sarah-Jane Scott, Laboratory for Laser Energetics, University of Rochester

Exhaust and Vacuum Systems

TPO-80: Design Progress of Plasma and Outer Vessel Exhaust Gas System Based on LOCA Safety Analysis of W7-X Stellarator 854

Didier Chauvin, CEA, DSM/IRFM, F-13108 Saint-Paul-lez-Durance, France

TO3-4: The THESEUS Facility - A Test Environment for the Torus Exhaust Vacuum Pumping System of a Fusion Power Plant 859

Thomas Giegerich, Institute for Technical Physics, Karlsruhe Institute for Technology (KIT), Karlsruhe, GERMANY

TO3-2: Exhaust Pumping of DT Fusion Devices: Current state-of-the-art and a potential roadmap to a power plant 865

Christian Day, Karlsruhe Institute of Technology (KIT)

TPO-81: Preleminary Results of Glow Discharge Cleaning Test on SWIP Test Bench 873

Yingqiao Wang, Southwestern Institute of Physics

TPO-86: Upgrades to the Alcator C-Mod Gas System 878

Roza Tesfaye, MIT PSFC

TPO-87: Experimental Validation of a Molecular Flow Code with the ARIANNA Setup 882

Emanuele Sartori, Consorzio RFX - Padova

Tritium Processing, Breeding and Containment

FO3-4: Tritium Permeation Issues for Helium-Cooled Breeding Blankets 888

Fabrizio Franza, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, D-76344

TPO-89: Development of a Flange Type Hydrogen Permeation Sensor for Liquid Breeders 894

Eo Hwak Lee, Korea Atomic Energy Research Institute

TPO-91: Liquid Lithium for the Purpose of Attenuating Tritium Inventory Levels in Fusion Energy Reactors 897

Charles Gentile, PPPL

TPO-93: Impact of Tritium Solubility in Liquid Pb-Li on Tritium Migration in Hcll and Wcll Blankets 899

Alessia Santucci, Associazione ENEA-Euratom sulla Fusione, C.R. ENEA Frascati, Via E. Fermi 45, 00044 Frascati (RM), I

TPO-94: Operation Scenario of Dt Fusion Plant Without External Initial Tritium 903

Saerom Kwon, Kyoto University

TPO-95: Hydrogen Solubility and Electrical Resistivity Measurements of Hydrogenated Pb-Li 908

Silvano Tosti, ENEA

TPO-90: Hydrogen Isotopes and Helium Diffusion Challenges on Future Nuclear Fusion Reactors 911

Moral, Nuria

Power Supply Systems

TPO-97: Research of the Soft Start Circuit for the High Voltage Power Supply Based on Psm Technology 917

Linglong Xia, Huazhong University of Science and Technology

TPO-98: HARDWIRED CONTROL SYSTEM CHANGES FOR NSTX DC POWER FEEDS 921

Subrahmanya Ramakrishnan, PPPL

TPO-99: Power Supply Changes for NSTX Resistive Wall Mode Coils 925

Subrahmanya Ramakrishnan, PPPL

ThO3-1: ITER Power Supply Innovations and Advancements 930

Charles Neumeyer, PPPL

TPO-100: Initial Integration of "Regulated High Voltage Power Supply" (RHVPS) with LHCD System of SST-1 938

Pareshkumar Patel, IPR

TPO-101: Development and Aging Tests of High Current Busbar Contacts for the ITER Coil Power Supply System 942

Elena Koktsinskaya, D.V. Efremov Scientific Research Institute of Electrophysical Apparatus, St. Petersburg

TPO-102: ITER Electrical Distribution System 948

Joel Hourtoule, Iter Organization

TPO-103: A Pulse Step Modulator Cathode Power Supply for Ecrh System on HI-2a Tokamak 953

Xiaohui Mao, Southwestern Institute of Physics, Chengdu, China

TPO-104: High-Voltage Power Supply for ECRH System on J-TEXT Tokamak 958

ShaoXiang Ma, Huazhong University of Science and Technology

TPO-107: Generation of High Power Pulse Series Based on Resistive Loads 963

Oleg Egorov, TRINITI

ThO3-3: Critical Revision of the RFX-mod ac/dc Conversion System Design and Possible Improvements 967

Alberto Ferro, Consorzio RFX-EURATOM-ENEA Association

TPO-108: Pulsed-Inductive-Plasma Thruster 972

Frank Wessel, Tri Alpha Energy, Inc.

Diagnostics, Data Acquisition, Control and Protection

ThPO-90: The Application of Mid-Range Control to Improve Thermal Disturbance Rejection for Cryogenic Thd/dt Layering at the National Ignition Facility 978

Matthew Dayton, Control Systems Engineering, National Ignition Facility, Laser Science Engineering and Operations, Law

ThPO-91: VME BASED DATA ACQUISITION AND CONTROL SYSTEM FOR GYROTRON BASED ECRH SYSTEM ON SST-1 983

Jatinkumar Patel, IPR

ThPO-93: The Preliminary Design of Global Interlock System in J-Text 987

Guozhen Zheng, J-TEXT Lab, Huazhong University of Science & Technology

ThPO-94: Eddy Current and Potential Gap Voltage at Electrical Contacts of ITER Diagnostic First Walls and Shield Modules During Plasma Disruption 991

Yuhu Zhai, PPPL

ThPO-95: Design and R&D for MITICA Thermal Sensors 997

Mauro Dalla Palma, Consorzio RFX

ThPO-96: Signal Conditioning & Data Acquisition System for Neutral Beam Calorimeter for NBI SST-1 1003

Laxmi Kant Bansal, IPR

ThPO-97: Assembly and Installation of ITER in-Vessel Electrical Looms 1007

Anna Encheva, ITER IO

ThPO-98: A Remote Control System for Tokamak Based on Web Service 1013

Wei Zheng, State Key Laboratory of Advanced Electromagnetic Engineering and Technology, HUST

ThPO-100: The Charge Exchange Recombination Spectroscopy Diagnostic on HI-2a Tokamak 1017

Lieming Yao, University of Electronic Science and Technology of China

ThPO-101: Design and Test of a Thermal Measurement System Prototype for Spider Experiment 1022

Mauro Dalla Palma, Consorzio RFX

ThPO-102: THE DIGITAL CONTROL SYSTEM FOR THE TCV TOKAMAK 1028

Hoang Bao Le, Ecole Polytechnique Fédérale de Lausanne, Center for Research in Plasma Physics (CRPP-EPFL)

ThPO-104: Iter Disruption Mitigation System Development and Port Plug Integration 1032

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

ThPO-108: Optical Layout and Alignment Methods for Visible Tomography and Emission Spectroscopy Diagnostics in Spider 1037

Rita Delogu, Consorzio RFX, Euratom-ENEA association

ThPO-110: A Magnet Current Monitor for Gyrotron Magnet Power Supplies 1042

Nevell Greenough, PPPL

WO3-4: Diagnostic Integration Issues in the Tore Supra Upgrade Project WEST 1046

Sophie SALASCA, CEA Cadarache (Association Euratom-CEA)

ThPO-112: Effect of the Measurement Vs. the Counting Errors in Neutron Tomography Analysis 1052

Michal Odyniec, NSTec

ThPO-113: Digital Coil Protection System I/O and Data Subsystem for NSTX-U 1058

Gregory Tchilinguirian, PPPL

ThPO-114: Reconfigurable Timing Unit for NSTX-U 1064

Gregory Tchilinguirian, PPPL

TO4-1: Cutting Edge Concepts for Control and Data Acquisition for Wendelstein 7-X 1068

Andreas Werner, Max-Planck Institute for Plasma Physics

ThPO-116: Electromagnetic Behavior on ITER Radial Soft X-Ray Camera 1073

Songke Wang, Institute Of Plasma Physics, Chinese Academy Of Sciences

ThPO-117: Divertor Erosion Monitoring in ITER Using 2-Wavelength Speckle 1077

Eric GAUTHIER, CEA Cadarache

ThPO-119: Hardware Requirements for Digital Nuclear Radiation Spectroscopy 1082

Marco Riva, ENEA FRASCATI

ThPO-120: Status of the Design Refinement and the Characterisation of the in Vessel Viewing

System for Iter 1086

Carlo Neri, Associazione EURATOM ENEA frascati

ThPO-122: Design and Preliminary Measurements of a Diagnostic Calorimeter for BATMAN 1090

Gianluigi Serianni, Consorzio RFX, Euratom-ENEA association, Corso Stati Uniti 4, 35127 Padova

ThPO-124: Development of Talbot-Lau Phase-Contrast Method for High Energy Density

Diagnostics 1096

Maria Pia Valdivia, Johns Hopkins University

ThPO-125: OPTIMAL CLOSED-LOOP CONTROL OF THE AZIMUTHAL VELOCITY PROFILE BY EXB

ACTUATION IN HELCAT 1101

Zeki Ilhan, Lehigh University

ThPO-126: Digital Coil Protection System for the National Spherical Torus Experiment Upgrade 1107

Ronald Hatcher, PPPL

ThPO-127: A Fast RF Power Diagnostics for the DIII-D Fast Wave Current Drive System Using

Commercial FPGA-Based Systems 1112

Ravi Marawar, National Instruments

ThPO-128: Neutronics Instrumentation for the European Iter Tbm 1117

Axel Klix, Karlsruhe Institute of Technology

ThPO-129: Latest Advancements in the DIII-D Plasma Control System 1121

Benjamin Penaflor, GA

ThPO-130: Designing, Constructing and Using Plasma Control System Algorithms on DIII-D 1125

Tucker, GA

ThO3-4: Nstx-U Digital Coil Protection System Software Design 1131Keith Erickson, PPPL

ThPO-132: Shape Reconstruction of RF-Driven Divertor Plasma on QUEST 1137

Kazuo Nakamura, Research Institute for Applied Mechanics, Kyushu University

ThPO-134: ASSESSMENT AND OPTIMIZATION OF THE INTERSPACE DOSE RATE OF THE DIAGNOSTICS EQUATORIAL PORT PLUG #3 IN ITER WITH ATTILA 1143

Mahmoud Youssef, UCLA

Fabrication, Assembly, Maintenance, and Availability

TPO-109: EBW technology applied on the ICRF Antenna Component 1149

Qingxi Yang, Institute of Plasma Physics, Chinese Academy of Science

TPO-110: THE DESIGN AND R&D WORK OF EAST TUNGSTEN DIVERTOR 1153

Zibo Zhou, Institute of Plasma Physics, CAS

TPO-114: DEMO: Heating and Current Drive System Integration with Blanket System 1157

Giovanni Grossetti, Karlsruher Institut für Technologie

TO6-4: Manufacturing of ITER Vacuum Vessel In-Wall Shielding 1163

Hareshbhai Pathak, IPR-ITER-India

WO3-6: The Development of a Methodology to Allocate Reliability, Availability, Maintainability and Inspectability Requirements to DEMO 1169

Richard Brown, The Culham Centre for Fusion Energy

TPO-115: New Design of the Support Leg for the ITER Transfer Cask System 1175

Shaoqing LI, Anhui University of Architecture, Hefei China, 230022

TPO-118: Early Design Verification of Iter Remote Handling Systems Using Digital Mock-Ups 1179

Romain Sibois, VTT Technical Research Centre of Finland

TO6-5: Preliminary Design of Iter Component Cooling Water System and Heat Rejection System 1185

Ajith AG, ITER India

ThO6-1: W7-X Precision Metrology 1190

Torsten Braeuer, Max-Planck-Institut fuer Plasmaphysik Greifswald

TPO-119: Design, Manufacturing and Testing of a Fast Disconnecting System for the European Target Assembly Concept of Ifmif 1198

Gioacchino Miccichè, ENEA

TPO-120: Qualification Process and Quality Control Planning for Jt-60-Sa Toroidal Field Coils Construction 1203

Valter Cocilovo, ENEA FNP FUSTEC

TO6-1: Design and Manufacture of the ITER Vacuum Vessel 1210

Carlo Sborchia, ITER

TPO-121: DEMO - Initiation of Remote Maintenance Requirements 1218

Martin Mittwollen, Karlsruhe Institute of Technology; Institute for Materials Handling and Logistics

Safety & Environmental Engineering

ThO5-2: Korean Activities on Fusion Safety 1224

Gyunyoung Heo, Kyung Hee University

TPO-123: Comparison with Simulations Using the PHITS code and Activated Materials Analysis toward JT-60SA Radiation Safety Assessment 1231

Atsuhiko Sukegawa, Japan Atomic Energy Agency

ThO5-5: Failure Rate Adjustment Factors for High Technology Components 1236

Lee Cadwallader, Idaho National Laboratory

TPO-124: Sensitivity Study on in-Vessel Loca of a Korean Tbs in Iter 1239

Hyung Gon Jin, KAERI

ThO5-4: Feasibility Study of Validating Activation Corrosion Products Calculations in Cooling Water Loops at Jet 1243

Luigi Di Pace, EURATOM/ENEA Fusion Association

TPO-126: Tritium Extraction System Pipe Break Environmental Impact by Atmospheric Modelling of Tritium Forms Transport 1249

CASTRO PALOMA, CEMAT

Systems Engineering & Project Management

WO3-1: Numerical Modeling in the Construction of Wendelstein 7-X 1256

Victor Bykov, Max-Planck-Institut für Plasmaphysik

WO3-2: Approaches to Numerical Modeling in the Development Process of Complex Structures for Fusion Devices 1264

Olaf Neubauer, Forschungszentrum Jülich GmbH

TPO-127: A Dynamic Simulation on the Demand of Human Resource for Construction of Korean Fusion Demo 1272

Hansoo CHANG, National Fusion Research Institute

TPO-128: Configuration Space Control of In-Vessel Components for Wendelstein 7-X 1274

Jörg Tretter, Max-Planck-Institute for Plasmaphysics, 85748 Garching, Germany

TPO-129: Do we need a quality management system in fusion research? - Experience from W7-X 1280

Reinhard Vilbrandt, Max Planck Institute for Plasma Physics, Greifswald, Germany

TPO-130: Design and Integration of the Ground Level Platform for W7-X 1285

Sébastien Renard, CEA, IRFM, F-13108 Saint-Paul-lez-Durance, France

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

Studies 1289

Jonathan Harman, EFDA

WO3-5: Management of the ITER Configuration Towards Construction Phase 1295

Ingo Kuehn, ITER