GA–A26134

DIII–D YEAR 2008 EXPERIMENT PLAN

by
DIII–D RESEARCH TEAM

JULY 2008

GENERAL ATOMICS

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GENERAL ATOMICS PROJECT 30200
JULY 2008

FOREWORD

This document presents the planned experimental activities for the DIII-D National Fusion Facility for the fiscal year 2008. This plan is part of a five-year cooperative agreement between General Atomics and the Department of Energy. The Experiment Plan advances on the objectives described in the DIII-D National Fusion Program Five-Year Plan 2003–2008 (GA-A23927). The Experiment Plan is developed yearly by the DIII-D Research Council and approved by DOE. DIII-D research progress is reviewed quarterly against this plan. The 2008 plan is for 18 weeks of tokamak research operations.

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1. SYNOPSIS OF THE 2008 DIII-D RESEARCH PLAN

The research campaign for 2008 is organized into the five Physics Groups making up the Experimental Science Division, with three additional Task Forces coordinated independently of that management structure (Fig. 1). Approximately 2/3 (44 days) of the time allocated in the 18-week experimental plan has been allocated to the Physics Groups, and their associated Working Groups. This reflects the broad base and scientific depth of the DIII-D experimental program. The remaining 1/3 (23 days) is allocated to the Task Forces, which are more narrowly focused on critical, shorter term, issues.

Fig. 1. The 2008 Experimental Campaign is organized into three Task Forces and 23 Working Groups within the Physics Groups of the Experimental Science Division. The Task Forces and Working Groups highlighted in yellow are considered high priority areas for the DIII-D program.

The three Task Forces and five Working Groups highlighted in yellow in Fig. 1 were identified by the Research Council as high priority research areas for the DIII-D program. The other Working Groups, shown in blue, were added in "bottom up" fashion through discussions within the Physics Groups. The high priority research areas are as follows:

- **ITER Demonstration Discharges**. The primary activity here will be to develop and evaluate the baseline H-mode, advanced inductive, hybrid, and steady-state scenarios envisioned for ITER. The goal of this research is to reproduce as many of the ITER core-plasma discharge characteristics (e.g., q_{95}, β_N, shape) to the extent possible, and to exploit these discharges as research platforms for development of a detailed physics basis for ITER (e.g., T_e=T_i, low rotation, detachment, ELM suppression, etc.). The research in this area will be organized as a Task Force under the Director of Experimental Science.

- **Rotation Physics**. It is now recognized that plasma rotation affects a broad range of fundamental tokamak physics. This is a critical near-term issue since ITER performance projections and system requirements are sensitive to the assumed plasma rotation. A FY2008 DOE OFES joint C-Mod/DIII-D/NSTX JOULE Milestone highlights the urgent need for rotation physics research. The full capabilities of the DIII-D heating and feedback control systems, along with its extensive diagnostic set, provide opportunities to plan a broad range of experiments to address this urgent research topic (e.g., experiments on intrinsic rotation, effect of rotation on RWM and NTM stability, non-resonant braking, error field screening, etc.). This effort will be organized as a Task Force under the Director of Experimental Science.

- **ELM Control and Pedestal Physics**. Research here should aim to develop a more complete understanding of the processes that control the ELM behavior and pedestal structure both with and without 3-D field effects. Topics of interest include comparison of pedestal structure with available models and detailed studies of the physics of both active ELM control and operation in ELM-free or small-ELM regimes. Experiments will be organized as a Task Force under the Director of Experimental Science.

- **Steady-state High-Beta Operation**. The primary focus of these experiments will be the demonstration of fully noninductive operation utilizing the increased EC power available in 2008. This research will be organized as a Working Group within Steady-State Integration.

- **Transport Model Validation**. New diagnostics, simulation tools, and tokamak capabilities enable focused experiments aimed at the validation of theory-based transport and turbulence models, including but not limited to GYRO and TGLF. Close coordination with theoreticians at GA and in the broader international community should lead to determination of key tests (both detailed and higher level integrated comparisons) that can and should be made using the profile and fluctuation diagnostics presently available on DIII-D. These experiments will be coordinated as a Working Group within Fusion Science.

- **Thermal Transport in the Plasma Boundary**. Divertor heat and particle flux have long been recognized as an important design driver for tokamak reactors, though the physics of 2D and 3D thermal transport in the scrape-off layer is not well established. DIII-D has extensive diagnostic and edge-plasma control capability which enables experiments to develop an improved H-mode edge and divertor database suitable for comparison with physics models and edge data from other tokamaks. Activities here will be organized as a Working Group within Fusion Science.

- **Hydrogenic Retention**. Tritium retention is a major driver for the choice of plasma facing components in ITER, and DIII-D is uniquely positioned to evaluate plasma-wall interactions with all-carbon PFCs. Topics of interest include quantifying carbon migration pathways, developing methods for mitigating carbon co-deposits, and testing techniques for removal of hydrogen species from co-deposits. Activity here will prepare us for addressing a proposed FY09 JOULE milestone and will be organized as a Working Group within ITER Physics.

- **ITER Startup, Shutdown, and Vertical Stability**. This group will develop a detailed database of proposed startup and shutdown scenarios for ITER through simulations on DIII-D as well as develop information required for assessing vertical stability issues for ITER. Research here will be organized as a Working Group in Plasma Control and Operations.

Below we convey the essential content of the various Task Force and Physics Groups and their goals and anticipated results. The research described is based on an 18-week experimental campaign. To allow for contingency, experimental time has been allocated for 67 run days out of a possible 90 run days, with 18 days of contingency and 5 days director's reserve. Additional detailed information can be found on the web, and related links: https://diii-d.gat.com/diii-d/Exp08.

The 2008 campaign follows a very successful 2007 campaign in which 12.8 weeks of operation were completed. The 2007 campaign was the second experimental campaign following the one-year long Long Torus Opening Activity (LTOA), in which several significant upgrades were made to the DIII-D facility. Experiments in 2007 continued to exploit the new capabilities added during the 2005-6 LTOA, including 1) reorientation of the 210-degree neutral beam line to provide 5 MW of neutral beam power directed opposite from the remaining five sources, allowing balanced neutral beam injection up to 10 MW input power; 2) installation of an extended shelf in the lower divertor to allow pumping of high triangularity single-null and double-null plasmas; and 3) additional ECH power and pulse length (up to 10 s, still in progress). During this campaign, many experiments were conducted in support of physics areas identified by the International Tokamak Physics Activity (ITPA) working groups (Table I). Although these experiments continued to support long-term physics needs of ITER, direct support of the ITER Design Review was a major consideration in setting priorities for the 2007 campaign. While the Design Review has been formally completed, many issues remain open and studies continue under the guidance of the ITER Science and Technology Advisory Committee (STAC). These, as well as other high priority physics issues for ITER, are given the highest priority in the 2008 experimental campaign (Table II). In 2008, DIII-D will also continue to actively support the ITPA through taking part in joint experiments (Table III).

To enable the success of ITER by providing physics solutions to key physics issues is the highest priority of three overarching goals for DIII-D research. The 18-week program plan for 2008 provides adequate experimental time for DIII-D to continue its leading roles in development of a physics basis for steady-state operation in ITER and beyond, and to advance the fundamental understanding of fusion plasmas along a broad front.

Table I
DIII-D Conducted a Number of Experiments in 2007 in Support of the International Tokamak Physics Activity (ITPA)

ID No	Title	DIII-D Experiment
CDB-2	Confinement scaling in ELMy H-modes: β degradation	Beta scaling of turbulence and transport
CDB-9	Density profiles at low collisionality	Particle transport
TP-3.1	Determine transport dependence on T_i/T_e ratio in hybrid and steady-state scenario plasmas	Expanding hybrid scenario to low rotation plasmas; dependence on T_i=T_e at low collisionality
TP-5	QH/QDB plasma studies	Rotation dependence of QH-mode
TP-6.1	Scaling of spontaneous rotation with no external momentum input	Intrinsic rotation and modulated momentum transport
TP-6.3	NBI-driven momentum transport study	Intrinsic rotation and modulated momentum transport
TP-7	Measure ITG/TEM line splitting and compare to codes	Discriminate between effects of ITG and TEM turbulence
PEP-2	Pedestal gradients in dimensionally similar discharges and their dimensionless scaling	Role of the pedestal region on global confinement in hybrid and conventional H-modes
PEP-7	Pedestal width analysis by dimensionless edge identity experiments on JET, ASDEX Upgrade, Alcator C-Mod and DIII-D	Role of the pedestal region on global confinement in hybrid and conventional H-modes
PEP-14	QH/QDB with co/counter rotation control in JT-60U and DIII-D	Rotation dependence of QH-mode
PEP-19	Edge transport under the influence of resonant magnetic perturbations in DIII-D and TEXTOR	Pedestal particle transport during RMP ELM control
PEP-20	Documentation of the edge pedestal in advanced scenarios	Role of the pedestal region on global confinement in hybrid and conventional H-modes
DSOL-2	Injection to quantify chemical erosion	Erosion/redeposition with carbon
DSOL-11	Disruption mitigation experiments	Disruption mitigation with Medusa valve
DSOL-14	Multi-code, multi-machine edge modeling and code benchmarking	Poloidal asymmetries of turbulence and flows in the edge/SOL
DSOL-16	Determination of the poloidal fueling profile	Poloidal asymmetries of turbulence and flows in the edge/SOL
MDC-1	Disruption mitigation by massive gas jets See DSOL-11	Disruption mitigation with medusa valve
MDC-8	Current drive prevention/stabilization of NTMs	Evaluate CW vs MOD and narrow vs broad ECCD control of 2/1 NTMs day 1
MDC-11	Fast ion losses and redistribution from localized AEs	Reverse shear Alfvén eigenmode stability effect of ECH on RSAEs
MDC-12	Non-resonant magnetic braking	Resonant vs non-resonant braking
SSO-2.1	Qualifying hybrid scenario at ITER-relevant parameters	Expanding hybrid scenario to low rotation plasmas; dependence on T_i=T_e at low collisionality; ELM suppression in hybrid scenario
SSO-2.2	MHD in hybrid scenarios and effects on q-profile	Effect of ECH/ECCD on the hybrid scenario
SSO-3	Modulation of actuators to qualify real-time profile control methods for hybrid and steady state scenarios	Continued development of feedback control of the safety factor profile the evolution in AT discharges
SSO-4	Documentation of the edge pedestal in advanced scenarios	Role of the pedestal region on global confinement in hybrid and conventional H-modes
SSO-5	Simulation and validation of ITER startup to achieve advanced scenarios	ITER start-up scenario testing

Table II
ITER Urgent Design Issues are a Major Focus for the DIII-D 2008 Campaign

STAC Topic	Topic Title	DIII-D experiment(s)
01.a	Vertical stability	ITER Startup, Shutdown, Vertical Stability WG • Vertical stability
01.b	Shape control/poloidal field coils	
04	ELM control	ELM Control and Pedestal Physics Task Force • Comparison of RMP ELM control with one vs two poloidal rows of perturbation coils • Central peaking with RMP ELM suppressed edge
08	Capacity of 17 MA discharge	ITER Demonstration Discharges Task Force • Advanced inductive discharges with $q_{95} < 3$

Additional topics	DIII-D effort
Disruption mitigation and avoidance	Disruptions Working Group
Hydrogenic retention	Hydrogenic Retention Working Group
Developing ITER reference discharges in each ITER operating scenario	ITER Demonstration Discharges Task Force
NTM stabilization	NTM Stabilization Working Group
Performance during hydrogen phase	Hydrogen Discharges Working Group

Table III
Many Experiments Planned During 2008 will Support the International Tokamak Physics Activity (ITPA)

ID No.	Title	DIII-D Experiment
CDB-10	Power ratio - hysteresis and access to H-mode with H~1	H-mode power threshold for EC and NBI leaked discharges and their dependence on input torque.
DIAG-2	First mirror activity	ITER Mirror performance test: Active control over mirror deposition by a local gas injection
DSOL-9	^{13}C injection experiments to understand C migration	^{13}C injection experiments to understand C migration
DSOL-11	Disruption mitigation experiments	Disruption mitigation with mixed species; enhanced disruption mitigation effectiveness with I-coil field; runaway electron diagnosis with pellets; low-Z pellet ablation
DSOL-12	Oxygen wall cleaning	Possible oxygen or air bake (under study)
DSOL-13	Deuterium co-deposition with carbon in gaps of plasma facing components	C deposition, D co-deposition in tile gaps
DSOL-19	Impurity generation mechanism and transport during ELMs for comparable ELMs across devices	Inter-machine comparisons for heat flux scaling and ELM heat; heat transport profiles and poloidal asymmetries
MDC-1	Disruption mitigation by massive gas jets	Same as DSOL-11 (above)
MDC-2	Joint experiments on resistive wall mode physics	RWM stability in slowly rotating high beta plasmas
MDC-5	Comparison of sawtooth control methods for neoclassical tearing mode suppression	Effects of rotation and fast ions on sawteeth
MDC-8	Current drive prevention/stabilization of NTMs	NTM detection and control by oblique ECE; stabilization of rotating 2/1 modes — modulated ECCD
MDC-11	Fast ion losses and redistribution from ocalized AEs	Low-NBI power NCS plasmas and BAAE investigation (high field NCS target plasmas); low field plasmas

ID No.	Title	DIII-D Experiment
MDC-12	Non-resonant magnetic braking	Non-resonant braking (normal and reversed I_P)
MDC-13	Vertical stability physics and performance limits in tokamaks with highly elongated plasmas	Vertical stability control limit assessment for ITER
MDC-14	Rotation effects on neoclassical tearing modes	Effect of rotation on NTM beta limits
PEP-2	Pedestal gradients in dimensionally similar discharges and their dimensionless scaling	DIII-D/JET pedestal width scaling with ρ* (depends on JET readiness)
PEP-17	Small ELM regimes at low pedestal collisionality	Obtain small ELMs at low collisionality to test pedestal structure models (if JET ρ* experiment not done)
PEP-19	Edge transport under the influence of resonant magnetic perturbations in DIII-D and TEXTOR	3D transport pattern in RMP ELM suppressed H-modes and their dependence on edge safety factor and collisionality; effect of RMP ELM suppression on pedestal particle sources and sinks
SSO-1	Document performance boundaries for steady state target *q*-profile	Fully noninductive operation
SSO-2.1	Qualifying hybrid scenario at ITER-relevant parameters	ITER demonstration discharges — AT + hybrid; ITER startup and hybrid discharges
SSO-3	Modulation of actuators to qualify real-time profile control methods for hybrid and steady-state scenarios	Profile control Part I: open loop trajectory control
SSO-5	Simulation and validation of ITER startup to achieve advanced scenarios	ITER startup and hybrid discharges
SSO-6	Ability to obtain and predict off-axis NBCD	Off-axis NBCD using vertically shifted, small plasmas
TP-4.2	Low momentum input operation effects on E×B shear and reduced transport	E×B shear vs magnetic shear effects on core barrier formation at q_{min}=2
TP-5	QH/QDB plasma studies	QH-mode at balanced input torque; QH-mode experiments with co-NBI
TP-6.1	Scaling of spontaneous rotation with no external momentum input	Balanced NBI studies of intrinsic rotation; effect of shape, density and temperature on intrinsic rotation

The experimental plan was compiled based on input and prioritization provided by the 2008 DIII-D Research Council. The Research Council develops a research plan on an annual basis based on the “DIII-D Five-Year Program Plan 2003–2008,” January 2003, GA-A23927, with adjustments made for scientific and programmatic issues identified since that plan was written. As already stated, these deliberations consider the needs of ITER and ITPA, as well as input from the US Burning Plasma Organization.

The experimental plan is also influenced by three programmatic and one joint facility JOULE milestones:

Milestone 165: Evaluate the use of non-axisymmetric magnetic fields for ELM control in ITER relevant plasmas (June, 2008).

Milestone 166: Exploration of ITER startup scenario issues (September, 2008).

Milestone 167: Evaluate plasma rotation and its impact on plasma stability and confinement (September, 2008). This milestone supports DIII-D's contributions to the joint facility JOULE milestone.

Joint facility JOULE milestone (SC GG 5.24.1): Conduct experiments on major fusion facilities leading toward the predictive capability for burning plasmas and configuration optimization (September, 2008).

In September 2007, a call for experimental research proposals towards the DIII-D objectives was issued and 471 proposals (Table IV and Appendix A) were received and presented at a community-wide Research Opportunities Forum (ROF; http://fusion.gat.com/global/Rof2008) on October 16-18, 2007. The overall interest of the general fusion community in research on DIII-D is exemplified by the large number of proposal submissions that were received from universities (138) and foreign labs (23). Remote participation, using H.323 video, was used in the plenary and most of the breakout sessions to allow participation by scientists at many remote locations, including Princeton Plasma Physics Laboratory, Massachusetts Institute of Technology, and Oak Ridge National Laboratory. The interest shown in the DIII-D program is partly a result of DIII-D's commitment to domestic and international collaborations as well as its participation in the ITPA process and ITER Design Review. A listing of the proposals received at the ROF is included as Appendix A of this report and can be viewed at http://fusion.gat.com/global/Rof2008.

Table IV
Proposal Statistics for the 2008 Campaign

Area	Proposals Received	Unique Proposals	Proposals in 18-week Plan for 2008	Backlog of Proposals Post 2008
Task Forces (reporting to Director of Experimental Science Division)				
ITER Demonstration Discharges	17	15	7	8
Rotation Physics	62	31	11	20
ELM Control and Pedestal Physics	80	76	12	64
Physics Groups (reporting to Physics Group Leaders)				
Steady-State Integration	63	58	11	47
Integrated Modeling	3	3	2	1
ITER Physics	67	61	17	44
Plasma Control and Operations	26	23	5	18
Fusion Science	153	130	14	116
Totals	**471**	**397**	**79 (67 days)**	**318**

From these proposals, the various Task Force and Physics Group Leaders met with their groups and developed a proposal for experimental time. This plan was then presented to the Research Council. Subsequently, the Research Council provided advice to the Director on the relative allocation of experimental time amongst the various areas. Based on this input, the Director established the experimental allocation for each program area.

The final run plan (Table V) reflects the DIII-D Team's commitment to support the ITER Design Review process, as embodied by issues identified by the ITPA, US BPO, the ITER Design Review Working Groups, and the ITER STAC. The plan is highlighted by experiments in support of urgent issues, where our research results may have an immediate impact on the ITER design itself. Experiments where DIII-D has unique capabilities to address these issues have been given highest priority.

Table V
Run Time Allocations for the 2008 Experiment Campaign

Area	Description	Plan (Days)	ITPA/IEA Experiments	Area Leaders
Task Forces (reporting to Director of Experimental Science Division)				
ITER Demonstration Discharges	Develop and evaluate the baseline H-mode, advanced inductive, hybrid, and steady-state scenarios envisioned for ITER	6	1	**E. Doyle** J. DeBoo
Rotation Physics	Advance our understanding of plasma rotation and its effect on plasma performance	8	3	**W. Solomon** A. Garofalo
ELM Control and Pedestal Physics	Understand the processes that control the pedestal structure and ELMs	9	4	**M. Fenstermacher** R. Groebner P. Snyder
Physics Groups (reporting to Physics Group Leaders)				
Steady-State Integration	Develop the physics basis for steady-state operation in ITER and future devices	11	2	**T. Luce**
Integrated Modeling	Experimental validation of complex theoretical models	2		**R. Prater**
ITER Physics	Provide physics solutions to key design and operational issues for ITER	13	6	**E. Strait**
Plasma Control and Operations	Develop and deploy state-of-the-art plasma control systems for DIII-D	4	3	**D. Humphreys**
Fusion Science	Advance basic fusion plasma science on DIII-D through test of basic theories, development of new measurement capabilities, and novel ideas	14	6	**C. Petty**
	Total allocated days	**67**	**25**	
	Director's reserve	**5**		
	Contingency	**18**		
	Available days	**90**		

DIII-D continues to have a large research backlog as is shown in Table IV. A measure of this backlog is obtained from comparing the number of proposals that the area leaders expect can be reasonably completed in a 18-week campaign during 2008 (79) compared to the total number of unique proposals (397). This leaves a proposal backlog of 318 proposals. The 2008 campaign, therefore, will only allow 20% of the proposed research to be conducted.

The 18 run week experimental plan for 2008, summarized in Tables V and VI, consists of efforts in three Task Forces and five Physics Groups. The Physics Groups themselves are in turn made up of a total of 23 Working Groups (Fig. 1).

- **Task Forces**

  Task Force on Rotation Physics (8 days; supports Milestone 167 and JOULE milestone). Plasma rotation affects a broad range of fundamental tokamak physics. This is a critical near-term issue since ITER performance projections and system requirements are sensitive to the assumed plasma rotation. These experiments should seek to understand rotation damping mechanisms, test theories of the source of intrinsic plasma rotation, better quantify momentum transport, and provide improved data on the effect of rotation on NTM and RWM stabilization. Activities here must provide the data necessary to meet DIII-D Milestone 167 and the OFES joint facilities JOULE milestone.

  Task Force on ITER Demonstration Discharges (6 days). The primary activity here should be to develop and evaluate the baseline H-mode and higher-performance scenarios envisioned for ITER. The main goal of these experiments is to reproduce as many of the ITER discharge characteristics to the extent possible in order to exploit these discharges as research platforms for development of a detailed physics basis for ITER. A key issue in these studies is to assess the effect of ITER's shape on the pedestal. Additional experiments should work toward improved understanding of the parameter sensitivity of selected scenarios.

  Task Force on ELM Control and Pedestal Physics (9 days; supports Milestone 165). Activities this year should be aimed at developing a more complete understanding of the processes that control the ELM behavior and pedestal structure, both with and without 3D effects to support the design of ITER. Highest priority should go towards experiments seeking to uncover the fundamental physics of ELM control as it relates to RMP techniques (in support of Milestone 165) and experiments to test the scaling of the pedestal height using the peeling-ballooning mode model. ELM pacing by pellets using he new pellet dropper should be explored. QH-mode studies should focus on the physics of the Edge Harmonic Oscillation (EHO).

- **Physics Groups**

  ITER Physics Group (13 days). The DIII-D ITER Physics Group has identified a number of urgent near-term and important longer-term research needs to support ITER. High priority topics include hydrogenic/tritium retention in carbon walls and disruption characterization and mitigation. These tasks together should get the largest share of the run time. Stability-related experiments in this area will benefit from the expected increase in EC power and improved understanding of the role of error-field screening. Evaluation of hydrogen plasma operation will be studied during a three day hydrogen campaign.

Steady State Integration (11 days). The demonstration of fully non-inductive operation utilizing increased EC and FW power should receive the greatest emphasis, but effort should also go towards exploring other high beta scenarios and making progress on developing the physics basis for advanced inductive scenarios due to its ITER relevance. Work on RWM feedback stabilization at low rotation should continue, which is relevant for advanced scenario operation in ITER and for the longer range development of the Advanced Tokamak.

Fusion Science (14 days). Fusion Science spans a very wide range of topics; virtually all research on DIII-D contains a strong fusion science component. Experiments supporting Transport Model Validation and Thermal Transport in the Boundary should receive high priority this year. One day in the January run period has been allocated to edge flow measurements in support of validating 2D edge models and one day to L-H transition physics in support of ITER. In addition, this year we have allocated significant additional run time to two independent task forces (Rotation Physics and ELM Control and Pedestal Physics) each created with a strong focus on specific areas of fusion science.

Integrated Modeling (2 days). Work on integrated modeling complements the activities of the Fusion Science area by seeking to validate specific codes/models against experiment.

Plasma Control (4 days plus unspecified number of 2-hour shifts; supports Milestone 166). Plasma control experiments in 2008 will support high priority research on ITER startup and vertical stability issues. Additional time, in the form of 2-hour extensions to run days, will be made available for model-based control development. One additional day is provided for further development and testing of model-based controls. These activities must provide the data necessary to meet Milestone 166.

The plans and goals for the various science areas are detailed below.

1.1. TASK FORCES FOR 2008

1.1.1. TASK FORCE ON ROTATION PHYSICS (includes milestone 167 and DIII-D support for JOULE milestone) (Leader: W.M. Solomon Deputy: A.M. Garofalo)

1.1.1.1. Mission. Seek to understand rotation damping mechanisms, test theories of the source of intrinsic plasma rotation, better quantify momentum transport, and provide improved data on the effect of rotation on NTM and RWM stabilization.

1.1.1.2. Importance and Urgency. ITER performance projections and system requirements are sensitive to the assumed plasma rotation. However, at this time our understanding of rotation physics is insufficient to consider these assumptions accurate. At the same time, we still have much to learn about the impacts of this rotation on MHD stability and transport.

1.1.1.3. Research Areas for 2008. This Task Force will focus on the following areas:

- Understand resonant and non-resonant damping of toroidal rotation. Specifically, test theoretical predictions of neoclassical toroidal viscosity.
- Identify mechanisms that drive intrinsic rotation and continue to build toward a predictive understanding.
- Determine the scaling of the critical β for NTM onset as a function of rotation. Investigate the internal structure of resonant field amplification and the Resistive Wall Mode.

1.1.1.4. New and/or unique Tools.

- Counter-NBI, provided by the rotated 210° beamline, allows control of applied torque decoupled from heating power.
- The internal I-coil can apply both resonant (n=1) and non-resonant (n=3) magnetic perturbations to the plasma.

1.1.2. TASK FORCE ON ITER DEMONSTRATION DISCHARGES (Leader: E.J. Doyle Deputy: J.C. DeBoo)

1.1.2.1. Mission. Perform an "apples to apples" comparison of core plasma properties for four ITER operating scenarios on a single present device. These discharges will provide increased confidence in performance projections made for ITER. Results of these experiments might clarify or completely change expectations for ITER, and might impact the ITER design. Finally, this task force will provide a set of “standard” discharges for use in other ITER related studies.

1.1.2.2. Importance and Urgency. Opportunities to impact the ITER design will rapidly decrease as the design review wraps up and major design points are frozen. Also, DIII-D is the only device in the world that is currently capable of demonstrating four scenarios in the ITER design shape at the performance levels envisioned for ITER.

1.1.2.3. Research Areas for 2008. This Task Force will focus on the following areas:

- Develop demonstration discharges in DIII-D, under as “ITER-like” conditions as possible, of the ITER Baseline (Scenario 2), Hybrid, Advanced Inductive, and Steady-State (Scenario 4) operating scenarios
- Perform sensitivity studies varying shape and other parameters.

1.1.2.4. New and/or unique Tools.

- This Task Force benefits from the flexibility of the DIII-D device, in particular in shaping and heating.

1.1.3. TASK FORCE ON ELM CONTROL AND PEDESTAL PHYSICS (includes milestone 165) (Leader: M.E. Fenstermacher Deputies: R.J. Groebner, P.B. Snyder)

1.1.3.1. Mission. To develop techniques to control ELM particle and energy losses for ITER.

1.1.3.2. Importance and Urgency of Research. One of the largest uncertainties in the design of ITER is its ability to withstand the effects of repetitive Type-I ELMs. In this respect, demonstrated ELM mitigation techniques are urgently required for ITER. DIII-D has pioneered the development of techniques that permit ELM-free operation with acceptable confinement. These techniques include QH-mode and active coil control. Because of the high leverage that these techniques may provide on ITER achieving its baseline goals, it is important to characterize the physics of these techniques and assess their applicability to ITER. In addition, any modifications to the ITER design that incorporate these techniques must be made during the ongoing ITER Design Review process, with decisions anticipated this year

1.1.3.3. Research Areas for 2007. The work will be organized around three ELM suppression/reduction techniques:

- **RMP ELM Suppression with the I-coil.** Establish the physics basis for stochastic boundary ELM control in ITER. Determine the role of collisionality, shape, perturbation spectrum, rotation, density and input power. Attempt to increase pedestal pressure in ELM-free discharges with $n = 3$ RMP. Test various I-coil and C-coil combinations to determine poloidal mode spectrum effects. Determine the degree of plasma flow screening of the RMP and compare observed changes in pedestal profiles with theoretical expectations. Examine the effect of $n = 1$ RMPs on ELM control in DIII-D for comparison with JET results. The results of these experiments are urgently needed for ITER.

- **QH-mode**. Establish whether the ELM-free QH-mode can be obtained with net co-current momentum injection to the core plasma by varying the co- vs counter-NBI balance. Explore the role of E_r and rotation as a function of beam balance and compare with JT-60U results. Expand QH-mode operating space to higher shaping, higher β, separation of triangularity and squareness effects, improved n_e control, and higher power, longer ECCD.

- **Pellet ELM Pacing.** The ELM frequency and size modification results, achieved with high frequency small pellet injection on AUG, will be tested on DIII-D. It should be possible to do these tests in plasmas with the ITER shape, collisionality and near zero central rotation.

1.1.3.4. New and/or Unique Tools

- The internal I-coil provides a unique capability to apply n=1 and n=3 RMP fields.
- Counter-NBI, provided by the rotated 210º beamline, allows control of applied torque decoupled from heating power.
- New pellet dropper will be used to test pellet ELM pacing.

1.2. PHYSICS GROUPS

In contrast to previous years, these groups parallel the organization of the DIII-D Experimental Science Division. Each consists of one or more working groups, reporting to the physics group leader.

1.2.1. ITER PHYSICS (Leader: E.J. Strait)

The ITER Physics group provides a home for several issues of importance to ITER, as well as a point of contact for future ITER physics needs. Several high priority ITER issues, in particular ELM control, startup, and vertical stability, are coordinated in other parts of the experimental program.

1.2.1.1. Mission. Provide physics solutions to key design and operational issues for ITER.

1.2.1.2. Importance and Urgency

- Short-term research is needed to address short-deadline urgent issues, identified during the ITER design review
- Several other issues have been identified that can be addressed in the medium-term and still have impact on the ITER design

1.2.1.3. Research Areas for 2008. This physics group is organized into the following working groups:

- Hydrogenic Retention (high priority). Develop a physics understanding of carbon sources, transport, and deposition. Qualify carbon for use as first-wall material in ITER.
- Disruptions. Develop a physics understanding of disruptions and impurity-induced fast shutdown. Explore improved methods for fast shutdown. Demonstrate integrated disruption avoidance, disruption detection, and disruption mitigation.
- NTM Stabilization. Establish a physics basis for NTM stabilization in ITER. Validate model predictions for NTM stabilization by modulated and continuous ECCD. Develop methods for control of locked tearing modes.
- Error Fields. Develop improved error correction for routine use in DIII-D. Test Ideal Perturbed Equilibrium model (IPEC code). This is a key tool for extrapolation to ITER's error field requirements.

- Hydrogen Discharges. Work toward a physics basis to predict ITER performance during the initial hydrogen operation phase. Revisit, and in many cases study for the first time, isotope scaling of L-H transition, energy confinement, pedestal width, ELM characteristics, ELM avoidance, and ELM suppression.

1.2.2. STEADY-STATE INTEGRATION (Leader: T.C. Luce)

1.2.2.1. Mission: Develop the Physics Basis for Steady-state Operation in ITER and Future Devices. Demonstrate stationary high-performance inductive and non-inductive solutions that would satisfy the objectives of future fusion devices. Develop sufficient physics understanding for projection and optimization of similar scenarios for existing and future tokamaks.

1.2.2.2. Importance and Urgency. Steady-state scenarios will likely be required in a future fusion-based power plant. In a shorter term, this effort should build a basis for steady-state scenarios in ITER, FDF, and DEMO. The urgency comes from a need to specify appropriate actuators to achieve steady-state ITER operation.

1.2.2.3. Research Areas for 2008. This physics group is organized into the following working groups:

- Fully Noninductive High Beta Operation (high priority). Optimization of existing steady state scenario with the goal of fully noninductive operation for τ_R. Exploration of higher β scenarios, with a target β_N=5. Explore new approaches to steady-state. This work is complementary with experiments studying the ITER SS scenario in the ITER Demonstration Discharges Task Force.

- Core Integration (Advanced Inductive). Clarify the role of the m=3/n=2 tearing mode in hybrid scenario performance. Establish a physics basis for extrapolation.

- Core-Edge Integration. Optimize particle inventory control for steady-state scenarios.

- RWM Physics. Demonstrate RWM feedback at low rotation. Establish a physics basis for rotational stabilization.

1.2.2.4. New and/or unique Tools.

- High power ECH/ECCD (five gyrotrons at start of campaign, possible sixth gyrotron available later in the year) for off-axis current drive.

- Lower pumped divertor facilitates particle control in plasma shapes optimized for high β.

- The internal I-coil and external C-coil for simultaneous error field and RWM control.
- Counter-NBI, provided by the rotated 210° beamline, allows control of applied torque decoupled from heating power, facilitating low-rotation studies.

1.2.3. FUSION SCIENCE (Leader: C.C. Petty)

1.2.3.1. Mission: Advance the fundamental science understanding of fusion plasmas, especially in areas where DIII-D has unique capabilities or high leverage.

1.2.3.2. Importance and Urgency. Understanding of the physics underlying the behavior of fusion plasmas is critical in building a predictive capability for the design and operation of future devices.

1.2.3.3. Research Areas for 2008. This physics group is organized into the following working groups. Although the topical science areas of previous years are each represented by a working group within Fusion Science, much of the work that would have previously been in these areas is now done elsewhere in the program. The overall emphasis on science in the DIII-D program is not diminished, rather it permeates the entire DIII-D research program.

- Transport Model Validation (high priority). New diagnostics, simulation tools, and tokamak capabilities enable focused experiments aimed at the validation of theory-based transport and turbulence models, including but not limited to GYRO and TGLF. Close coordination with theoreticians at GA and in the broader international community should lead to determination of key tests (both detailed and higher level integrated comparisons) that can and should be made using the profile and fluctuation diagnostics presently available on DIII-D.
- Thermal Transport in the Plasma Boundary (high priority). Divertor heat and particle flux have long been recognized as an important design driver for tokamak reactors, though the physics of 2D and 3D thermal transport in the scrape-off layer is not well established. DIII-D has extensive diagnostic and edge-plasma control capability that enables experiments to develop an improved H-mode edge and divertor database suitable for comparison with physics models and edge data from other tokamaks.
- Transport. The goal of the DIII-D Transport Topical Area is to develop a fundamental and comprehensive understanding of turbulence and transport behavior in magnetically confined plasmas, with a long-term goal of developing a predictive capability for turbulent transport. Progress in this area is closely coupled with development of theory-based turbulent transport models.

- Stability. The goal of the DIII-D Stability Topical Area is to establish the scientific basis to predict and control macroscopic instabilities.
- Heating and Current Drive. The goal of the DIII-D Heating & Current Drive Topical Area is to develop comprehensive, predictive models for NBCD, ECCD, and FWCD. In addition, research on the self-generated bootstrap current is in this topical area.
- Boundary. The goal of the DIII-D Boundary Topical Area is to establish the scientific basis for particle and power control in burning plasma devices.
- Energetic Particles. The goal of the DIII-D Energetic Particles Topical Area is to provide the scientific basis of energetic particle instabilities in future burning plasma devices.

1.2.3.4. New and/or Unique Tools.

- DIII-D's uniquely comprehensive diagnostic set facilitates detailed fusion science studies.
- Unique capabilities to vary shape, heating location and mix, density, …

1.2.4. INTEGRATED MODELING (Leader: R. Prater)

1.2.4.1. Mission. This group is responsible for the experimental validation of complex theoretical models.

1.2.4.2. Importance and Urgency. Understanding of the physics underlying the behavior of fusion plasmas is critical in building a predictive capability for the design and operation of future devices. This understanding will be embodied in codes representing complex physical models. Experimental validation is a critical step in preparing these codes for use as predictive tools.

1.2.4.3. Research Areas for 2008. This physics group has a single working group:

- Integrated Modeling: Experimental comparison of SOL flows with UEDGE model. Experimental test of resistive MHD.

1.2.4.4. New and/or Unique Tools.

- All of the tools listed for Fusion Science are applicable.
- In addition, close collaboration with the GA Theory Group and other modelers is important for this effort.

1.2.5. PLASMA CONTROL AND OPERATIONS (Leader: D. Humphreys)

1.2.5.1. Mission. Develop and deploy state-of-the-art plasma control systems for DIII-D. Study control issues for ITER.

1.2.5.2. Importance and Urgency. Studies of the ITER startup and shutdown, as well as vertical stability, are of critical short-term importance to ITER and may have impact on the design of that device. The work in model-based control should have impact on the DIII-D program within the next year, and should improve our ability to develop and control new sets of plasma conditions.

1.2.5.3. Research Areas for 2008. This physics group is organized into the following working groups:

- ITER Startup, Shutdown, and Vertical Stability (high priority, **includes milestone 166**). Test startup scenarios for ITER (original small-bore and more recent large-bore). Demonstrate that a plasma can be formed and ramped up using one of the ITER scenarios and obtain an advanced operating scenario (Hybrid) in the resulting plasma. Assess ability of ITER coil configuration to effectively maintain vertical stability of the plasma.
- Model-based Control. Develop MIMO based plasma control for routine operation in DIII-D. Develop model-based profile control.

1.2.5.4. New and/or Unique Tools.

- Unique DIII-D Plasma Control System

1.3. RESEARCH PROPOSALS RECEIVED

A detailed list of research proposals received during the 2007 ROF is given in Appendix A. These proposals formed the basis for the 2008 campaign.

1.4. DETAILED LIST OF SCHEDULED EXPERIMENTS

Table VI lists the experiments scheduled during the 2008 experimental campaign.

Table VI
Detailed list of scheduled experiments for the 2008 Experiment Campaign

Date	Title	Area	SL
1/7/08	Startup and post-boronization cleanup		West
1/8/08	Establish and document ITER baseline scenario discharges on DIII-D	ITER demonstration discharges	Doyle
1/9/08	ITER startup and hybrid discharges (1/2 day)	ITER startup, shutdown, vertical stability	Jackson
1/9/08	Vertical stability (1/2 day)	ITER startup, shutdown, vertical stability	Humphreys
1/10/08	Discharges with q_{95}<3 (1/2 day)	ITER demonstration discharges (Director's Reserve)	Wade
1/10/08	Non-resonant braking (1/2 day)	Rotation physics	Garofalo
1/11/08	Simultaneous control of RWM and NTM in low rotation high beta plasmas	RWM physics	Okabayashi
1/14/08	One vs two rows of RMP coils for ELM suppression	ELM control and pedestal physics	Fenstermacher
1/15/08	Establish and document ITER baseline scenario discharges on DIII-D (1/2 day)	ITER demonstration discharges	Doyle
1/15/08	Non-resonant braking (1/2 day)	Rotation physics	Garofalo
1/16/08	ITER steady-state scenario demonstration discharges	ITER demonstration discharges	Ferron
1/17/08	Effect of core rotation on SOL flows	Boundary	Leonard
1/18/08	Contingency		
1/21/08	ITER startup and hybrid discharges (1/2 day)	ITER startup, shutdown, vertical stability	Jackson
1/21/08	Non-resonant braking (1/2 day)	Rotation physics	Garofalo
1/23/08	Non-resonant braking	Rotation physics	Garofalo
1/24/08	Improved correction for RH plasmas (1/2 day)	Error fields	Schaffer
1/24/08	QH-mode at balanced input torque (1/2 day)	ELM control and pedestal physics	Burrell
1/25/08	Non-resonant braking with reversed I_P (1/2 day)	Rotation physics	Garofalo
1/25/08	Contingency		
1/28/08	Dependence of L-H transition power threshold on rotation	Transport	Gohil
1/29/08	Dependence of L-H transition power threshold on rotation	Transport	Gohil
1/30/08	One vs two rows of RMP coils for ELM suppression (1/2 day)	ELM control and pedestal physics	Fenstermacher
1/30/08	Central fueling of RMP ELM suppressed H-modes with high frequency pellets (1/2 day)	ELM control and pedestal physics	Moyer
1/31/08	Establish and document ITER baseline scenario discharges on DIII-D (1/2 day)	ITER demonstration discharges	Doyle
1/31/08	One vs two rows of RMP coils for ELM suppression (1/2 day)	ELM control and pedestal physics	Fenstermacher

Date	Title	Area	SL
2/1/08	One vs two rows of RMP coils for ELM suppression (1/2 day)	ELM control and pedestal physics	Fenstermacher
2/1/08	Mixed-species gas injection (1/2 day)	Disruptions	Hollmann
2/20/08	ITER demonstration discharges - AT + hybrid	ITER demonstration discharges	Politzer
2/21/08	Simultaneous control of RWM and NTM in low rotation high beta plasmas	RWM physics	Okabayashi
2/22/08	Detection and control by oblique ECE (1/2 day)	NTM stabilization	Volpe
2/22/08	Advanced inductive discharges with $q_{95} < 3$ (1/2 day)	ITER demonstration discharges	Wade
2/25/08	Effect of RMP ELM suppression on pedestal particle transport and turbulence	ELM control and pedestal physics	Moyer
2/26/08	Balanced NBI studies of intrinsic rotation	Rotation physics	deGrassie
2/27/08	In search of successful radiating divertor operation near DN	Core-edge integration	Petrie
2/28/08	Contingency		
2/29/08	Contingency		
3/3/08	Fully noninductive operation day 1	Fully noninductive high beta operation	Ferron
3/4/08	Internal structure of RFA/RWM (1/2 day)	Rotation physics	Lanctot
3/4/08	Advanced high-beta error correction (1/2 day)	Error fields	Garofalo
3/5/08	Effect of RMP ELM suppression on pedestal particle sources and sinks	ELM control and pedestal physics	Evans
3/6/08	Contingency		
3/7/08	Contingency		
3/24/08	Resonant (*n*=1) braking and error field thresholds (1/2 day)	Rotation physics	Reimerdes
3/24/08	ITER mirror performance (1/2 day)	General I_p	Rudakov
3/25/08	Test pedestal structure models dependence on β_{pol} by I_p scan	ELM control and pedestal physics	Groebner or Leonard
3/26/08	Inter-machine comparisons for heat flux scaling and ELM heat	Thermal transport in the plasma boundary	Lasnier
3/27/08	Validation of co/countr NBCD	Heating and current drive	Petty
3/28/08	Off-axis NBCD	Heating and current drive	Murakami
3/31/08	Sensitivity study of baseline scenario	ITER demonstration discharges	Doyle
4/1/08	Effect of shape, density and temperature on intrinsic rotation	Rotation Physics	deGrassie
4/2/08	Physics basis for advanced inductive performance improvement	Core integration (advanced inductive)	Politzer
4/3/08	Sensitivity study of AT scenario	ITER demonstration discharges	Ferron
4/4/08	Stabilization of rotating 2/1 modes — modulated ECCD	NTM stabilization	Welander
4/7/08	Fully noninductive operation day 2	Fully noninductive high beta operation	Ferron (placeholder)
4/8/08	Vertical stability (1/2 day)	ITER startup, shutdown, vertical stability	Humphreys
4/8/08	ITER startup and hybrid discharges (1/2 day)	ITER startup, shutdown, vertical stability	Jackson
4/9/08	Stabilization of current driven RWMs	RWM physics	Jackson
4/10/08	Pellet ELM pacing with DIII-D pellet dropper (1/2 day)	ELM control and pedestal physics	Baylor/ Jernigan

Date	Title	Area	SL
4/10/08	Use ECH/ECCD to modify/control pedestal structure (1/2 day)	ELM control and pedestal physics	Groebner
4/11/08	Contingency		
4/14/08	Search for magnetic structure patterns on surfaces due to RMP and effect of Q-variation	ELM control and pedestal physics	Oliver Schmitz
4/15/08	High field NCS target plasmas	Energetic particles	Van Zeeland
4/16/08	Effect of RMP on disruption mitigation	Disruptions	Humphreys
4/17/08	Runaway electron diagnosis with pellets	Disruptions	TBD
4/18/08	Low-Z pellet ablation (1/2 day)	Disruptions	TBD
4/18/08	Contingency		
5/5/08	Dependence of RWM damping on rotation profile	RWM physics	Reimerdes
5/6/08	Verification of neutral beam torque profiles	Rotation physics	TBD
5/7/08	Heat transport profiles and poloidal asymmetries	Thermal transport in the plasma boundary	Boedo
5/8/08	Test contribution of edge orbit loss on intrinsic rotation (1/2 day)	Rotation physics	TBD
5/8/08	Low field plasmas (1/2 day)	Energetic particles	Heidbrink
5/9/08	Contingency		
5/12/08	Fully noninductive operation day 3	Fully noninductive high beta operation	Ferron (placeholder)
5/13/08	ITER demonstration discharges — TBD	ITER demonstration discharges	Doyle
5/14/08	Heat transport profiles and poloidal asymmetries	Thermal Transport in the Plasma Boundary	Boedo
5/15/08	Validation of nonlinear resistive MHD models using classical tearing modes	Integrated Modeling	Lao
5/16/08	Contingency		
6/2/08	ITER startup, day 2	ITER startup, shutdown, vertical stability	Jackson
6/3/08	Temperature gradient modulation	Transport model validation	DeBoo
6/4/08	Obtain small ELMs at low collisionality to test pedestal structure models	ELM control and pedestal physics	Osborne
6/5/08	Test NTV with modulated I-coils	Rotation physics	Burrell
6/6/08	Effect of rotation on NTM beta limits	Rotation physics	Buttery
6/9/08	QH-mode at balanced input torque (1/2 day)	ELM control and pedestal physics	Burrell
6/9/08	QH-mode optimization using n=3 RMP for n_e and V_{rot} control (1/2 day)	ELM control and pedestal physics	Osborne
6/10/08	Contingency		
6/11/08	Dimensionless variable scans of collisionality	Transport model validation	C. Holland
6/12/08	D retention in unpumped/pumped discharges in DIII-D and C-Mod	Hydrogenic retention	West
6/13/08	Contingency		
6/16/08	New initiatives-day 1	General SSI	Luce (placeholder)
6/17/08	ExB shear vs magnetic shear effects on core barrier formation at q_{min} = 2	Transport	Burrell
6/18/08	Poloidal rotation studies	Rotation physics	TBD
6/18/08	MIMO demo	Model-based control	Walker?
6/19/08	Marginal 2/1 island (1/2 day)	Stability	La Haye
6/19/08	Profile control (1/2 day)	Model-based control	TBD
6/20/08	Effect of rotation and fast ions on sawteeth	Stability	Lazarus

Date	Title	Area	SL
6/23/08	Access to $\beta_N = 5$	Fully noninductive high beta operation	Ferron (placeholder)
6/24/08	Contributions of TEM and ETG transport	Transport model validation	Peebles
6/25/08	Contingency		
7/14/08	C deposition, D co-deposition in tile gaps (1/2 day)	Hydrogenic retention	TBD
7/14/08	Impact of castellation on fuel retention (1/2 day)	Hydrogenic retention	TBD
7/15/08	Director's Reserve		
7/16/08	Measure the flows in the main plasma and the SOL and compare to the 2D model UEDGE.	Integrated modeling	Groth
7/17/08	Director's Reserve		
7/18/08	Contingency		
7/21/08	New initiatives-day 2	General SSI	Luce (placeholder)
7/22/08	L-H transition in hydrogen plasmas	Hydrogen discharges	Gohil
7/23/08	Pedestal and ELM characteristics in hydrogen plasmas	Hydrogen discharges	Gohil
7/24/08	Transport and ρ^* scaling studies in hydrogen plasmas	Hydrogen discharges	Gohil
7/25/08	Contingency		
7/28/08	Director's Reserve		
7/29/08	Director's Reserve		
7/30/08	Director's Reserve (1/2 day)		
7/30/08	Contingency (1/2 day)		
7/31/08	D retention in tungsten (1/2 day)	Hydrogenic retention	Rudakov
7/31/08	Carbon sources, transport and deposition: preparation for oxygen bake (1/2 day)	Hydrogenic retention	Rudakov
8/1/08	Carbon sources, transport and deposition: preparation for oxygen bake	Hydrogenic retention	Allen

1.5. THE 2008 OPERATIONS SCHEDULE

The operations schedule is designed for efficient and safe use of the DIII-D facility. Eighteen calendar weeks of plasma physics operations is scheduled for the fiscal year 2008. The operations schedule is shown in Fig. 2. Operations are carried out 5 days per week for 8.5 hours. The 2008 operations schedule can be viewed at http://d3dnff.gat.com/Schedules/fy2008Sch.htm.

In addition to operating the tokamak, maintenance has to be performed and new hardware is being installed to enhance DIII-D capabilities. The schedule calls for these maintenance activities to be carried out during the weeks the tokamak is not operating.

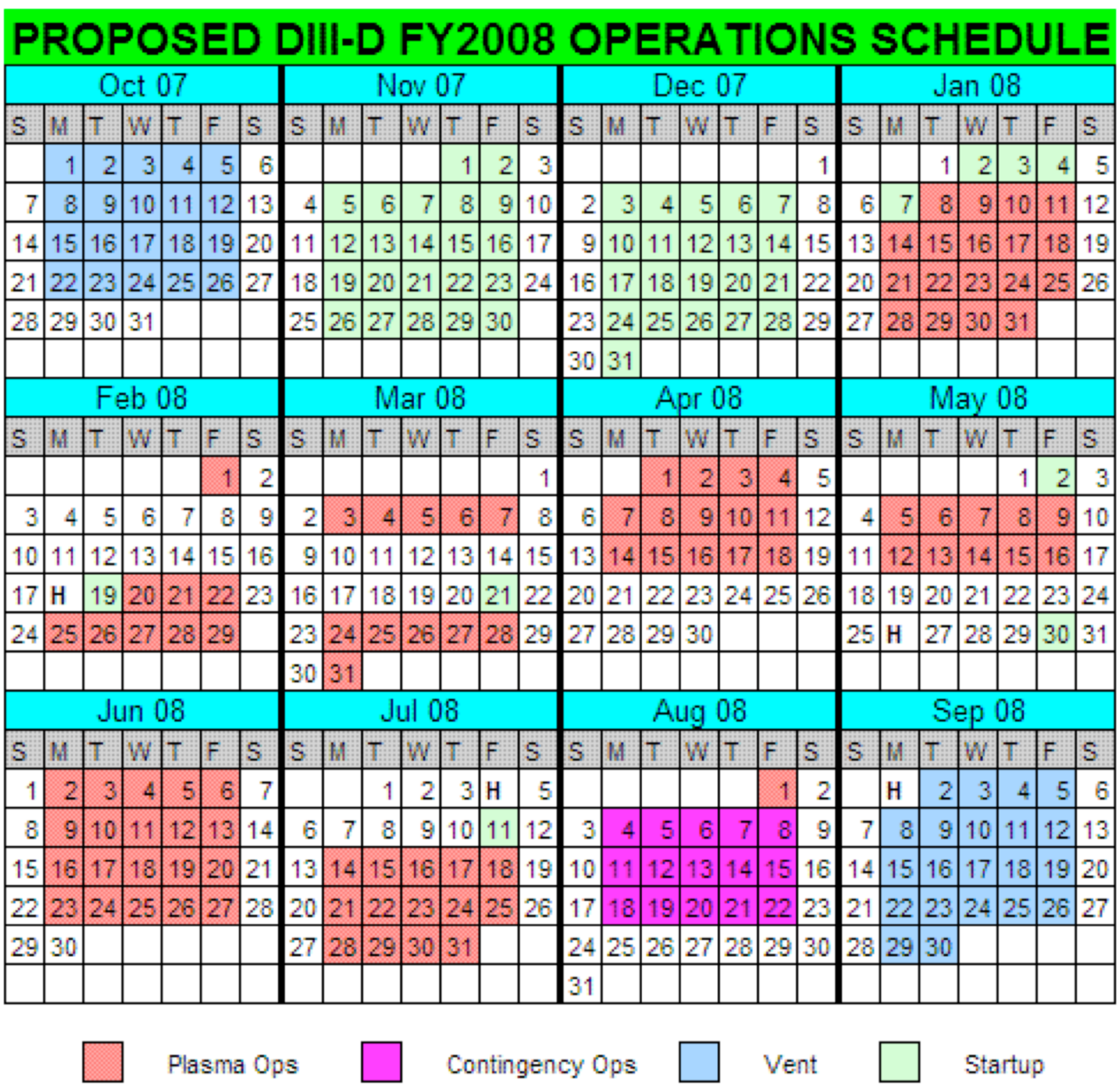

Fig. 2. DIII–D master schedule FY2008 (18-week plan).

ACKNOWLEDGMENT

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APPENDIX A
RESEARCH PROPOSALS RECEIVED

ID	Name	Affiliation	Title	Research Area
14	John Degrassie	GA	Develop near-balanced NBI for use in intrinsic rotation scaling experiments.	Rotation Physics
15	John Degrassie	GA	Intrinsic rotation in helium H-mode discharges.	Rotation Physics
16	John Degrassie	GA	Expand the dimensionless similarity database on intrinsic rotation	Rotation Physics
17	John C. Wesley	GA	Mixed Gas MGI	Disruptions
18	John Degrassie	GA	Measure intrinsic rotation in the JET shape	Rotation Physics
19	John Degrassie	GA	Use DIII-D pumping capability to separate density and temperature in Rice's scaling	Rotation Physics
20	John Degrassie	GA	RMP penetration vs rotation	ELM Control & Pedestal Physics
21	Mickey R. Wade	GA	Does Confinement Improvement Saturate with Increasing Rotation?	Rotation Physics
22	Mickey R. Wade	GA	Collisionality Dependence of RMP Suppression	ELM Control & Pedestal Physics
26	Mickey R. Wade	GA	Commonality of Density Threshold for RMP ELM Suppression and QH-mode	ELM Control & Pedestal Physics
27	John C. Wesley	GA	Disruption Statistics and Prediction	Disruptions
28	John Degrassie	GA	Small-sized LSN to test off axis NBCD	Heating & Current Drive
29	Holger Reimerdes	Columbia U	ITER-AT demonstration discharge	ITER Demonstration Discharges
30	Holger Reimerdes	Columbia U	High beta error field threshold	Rotation Physics
31	Holger Reimerdes	Columbia U	Parametric dependencies of RWM damping in rotating plasmas	RWM Physics
32	Holger Reimerdes	Columbia U	Multiple n dynamic error field correction	RWM Physics
33	Holger Reimerdes	Columbia U	Real-time stability measurement using active MHD spectroscopy	RWM Physics
34	Holger Reimerdes	Columbia U	Cross-machine comparison of n=2 (non-resonant) magnetic braking	Rotation Physics
35	Robert I. Pinsker	GA	High central fast wave current drive efficiency at high electon beta with 110 GHz EC preheating	Fully Noninductive High Beta Operation
36	Robert I. Pinsker	GA	FW-only H-mode studies	Heating & Current Drive
37	Robert I. Pinsker	GA	FW coupling and electron heating in ELM-stabilized H-modes with RMPs - continued	ELM Control & Pedestal Physics
38	Jose A. Boedo	UC San Diego	Heat transport profiles and poloidal asymmetries	Thermal Transport in the Plasma Boundary
39	Jose A. Boedo	UC San Diego	Rotation and ELMs	ELM Control & Pedestal Physics
40	Jose A. Boedo	UC San Diego	Heat Footprint active control using applied magnetic fields	Thermal Transport in the Plasma Boundary

ID	Name	Affiliation	Title	Research Area
41	Jose A. Boedo	UC San Diego	ELM heat deposition characterization and control	Thermal Transport in the Plasma Boundary
42	Jose A. Boedo	UC San Diego	ELM Heat deposition control using detachment	Thermal Transport in the Plasma Boundary
43	Jose A. Boedo	UC San Diego	Rotation transfer across LCFS	Boundary
44	Jose A. Boedo	UC San Diego	Ploidal asymmetries of flows in the boundary/SOL	Boundary
45	Jose A. Boedo	UC San Diego	Poloidal asymmetries of turbulence and heat/particle transport	Boundary
46	Jose A. Boedo	UC San Diego	Penetration of magnetic perturbations in plasma	ELM Control & Pedestal Physics
47	Jose A. Boedo	UC San Diego	Effect of RMPs on fluctuations and transport in edge/SOL	ELM Control & Pedestal Physics
48	Raffi Nazikian	PPPL	Multi-field Measurements of NTMs and Fast Ion redistribution in Hybrid Plasmas	Core Integration (Advanced Inductive)
49	Raffi Nazikian	PPPL	Multifield Measurement of Low-n Alfven Eigenmodes in the Core of DIII-D Plasmas	Energetic Particles
50	Richard Groebner	GA	Test of a theoretical model for the irreducible minimal pedestal width scaling	ELM Control & Pedestal Physics
51	Alex James	UC San Diego	Runaway electon diagnosis by impurity pellet injection	Disruptions
52	Punit Gohil	GA	Determination of ITER LH Threshold power	General IP
53	Richard Groebner	GA	Test of Paleoclassical Model for Pedestal Electron Temperature Profile	ELM Control & Pedestal Physics
54	C. Craig Petty	GA	Steady State FDF Based on Hybrid Scenario	Core Integration (Steady-State Scenario)
55	Alan Hyatt	GA	non-VFI Operations with RTEFIT	Model based Control
56	C. Craig Petty	GA	Sustaining Low q(0) With Monster Sawtooth Control	Core Integration (Steady-State Scenario)
57	C. Craig Petty	GA	Gyroradius Scaling in Hybrid Plasmas	Core Integration (Advanced Inductive)
58	C. Craig Petty	GA	ECCD in High Beta Poloidal Plasmas	Heating & Current Drive
59	C. Craig Petty	GA	ECCD at High Electron Temperature	Heating & Current Drive
60	C. Craig Petty	GA	Dependence of Stiffness on Elongation	Transport Model Validation
61	C. Craig Petty	GA	Direct Measurement of ECCD Width from Modulated ECCD	Heating & Current Drive
62	C. Craig Petty	GA	Measurement of Inductive Poloidal Current	Heating & Current Drive
63	C. Craig Petty	GA	Extreme Off-Axis ECCD	Heating & Current Drive
64	C. Craig Petty	GA	Sustained Monster Sawteeth	Energetic Particles

ID	Name	Affiliation	Title	Research Area
65	C. Craig Petty	GA	Simulation of Alpha Channeling Current Drive	Heating & Current Drive
66	C. Craig Petty	GA	Separating Rotational Shear and rho* Scaling Effects on Transport	Transport Model Validation
67	C. Craig Petty	GA	High Performance Operation With Te=Ti	Core Integration (Steady-State Scenario)
68	C. Craig Petty	GA	Modulation of Bootstrap Current	Heating & Current Drive
69	C. Craig Petty	GA	Electron Heat Pinch	Transport
70	C. Craig Petty	GA	Neutral Beam Current Drive Profile	Heating & Current Drive
71	C. Craig Petty	GA	Well Aligned Current Drive for Sustaining High qmin	Core Integration (Steady-State Scenario)
72	C. Craig Petty	GA	Measuring the Structure of Tearing Modes	Stability
73	C. Craig Petty	GA	Mach Number Scan With Similar Parameters as JT-60U	Transport
74	C. Craig Petty	GA	Is the 3/2 NTM Worth Suppressing in Hybrid Discharges?	Core Integration (Advanced Inductive)
75	C. Craig Petty	GA	Simultaneous Suppression of 3/2 and 4/3 NTM with ECCD	Core Integration (Advanced Inductive)
76	Alan Hyatt	GA	Voltage controlled VFI bus operations	General PCO
77	Punit Gohil	GA	Dependence of the H-L transition on toroidal rotation	Transport
78	John Degrassie	GA	High Collisionless NBI Torque Drive for GAMs, aka the VH-mode path?	Transport
79	Alan Hyatt	GA	Re-optimize the Breakdown process	Model based Control
80	Max Austin	U of Texas	Core transport barriers in EC-heated discharges	Transport
81	Gary Jackson	GA	ECH assisted breakdown and startup for DIII-D and ITER	ITER Startup, Shutdown, Vertical Stability
82	Gary Jackson	GA	Optimize DIII-D startup, i.e. stop initiating on the outer wall	General PCO
83	John Degrassie	GA	Is the Reduced L-H Threshold With Counter Beams Due to Lost Ions, or Velocity per se?	Rotation Physics
84	Gary Jackson	GA	Physics of n=3 nonresonant braking. Is there an unknown n=3 error field?	RWM Physics
85	Gary Jackson	GA	Current driven RWM target discharges for feedback stabilization experiments	RWM Physics
86	Jim C. DeBoo	GA	Characterization of Turbulence Associated with TEMs	Transport Model Validation
87	Jim C. DeBoo	GA	Impact of Rotation on Incremental Diffusivity in Hybrid Discharges	Rotation Physics
88	Gary Jackson	GA	Plasma rotation with Icoil rotating fields	Rotation Physics
89	C. Craig Petty	GA	Higher Beta ELM-Suppressed Hybrids	ITER Demonstration Discharges

ID	Name	Affiliation	Title	Research Area
90	C. Craig Petty	GA	RMP ELM-Suppression With Higher Confinement	ELM Control & Pedestal Physics
91	C. Craig Petty	GA	Hybrid Beta Limit at Low Rotation	Core Integration (Advanced Inductive)
92	Max E. Fenstermacher	LLNL	External n=3 RMP for ITER ELM Control Tests	ELM Control & Pedestal Physics
93	Max E. Fenstermacher	LLNL	Single Internal Row n=3 RMP for ELM Control	ELM Control & Pedestal Physics
94	Max E. Fenstermacher	LLNL	Physics of Safety Factor Resonance for n=3 RMP ELM Suppression	ELM Control & Pedestal Physics
95	Max E. Fenstermacher	LLNL	RMP Effect on Location of P-B Stability Boundary	ELM Control & Pedestal Physics
96	Raffi Nazikian	PPPL	Determine Adiabatic Electron Response for High-n Modes in QH Plasmas	Energetic Particles
97	Michael Walker	GA	Operational implementation of model-based shape control (MIMO)	Model based Control
98	Jim C. DeBoo	GA	Ion response to Te heat pulses	Transport
99	Oliver Schmitz	FZ Juelich	Establishment of a database for EMC3/EIRENE benchmark and direct comparison to TEXTOR (1)	Thermal Transport in the Plasma Boundary
100	Oliver Schmitz	FZ Juelich	Establishment of a database for EMC3/EIRENE benchmark and direct comparison to TEXTOR (2)	ELM Control & Pedestal Physics
101	George R. McKee	U of Wisconsin, Madison	Measurements of Neutral Beam Excited State Lifetime	Transport
102	George R. McKee	U of Wisconsin, Madison	Collisional damping of zonal flows/GAMs	Transport
103	George R. McKee	U of Wisconsin, Madison	Turbulence and Transport dependence on Mach number in Hybrid discharges	Transport
104	George R. McKee	U of Wisconsin, Madison	Excitation of the Geodesic Acoustic Mode via Radial Field Oscillation	Transport
105	C. Craig Petty	GA	Comparison of EC and NBI H-mode Thresholds	Transport
106	Todd E. Evans	GA	Isolating particle sources and sinks in RMP H-modes with core pellet fueling	ELM Control & Pedestal Physics
107	Jay Jayakumar	LLNL	neutral beam injection for MSE calibration and comparison of NBCD with code calculations	Heating & Current Drive
108	Richard Groebner	GA	Comparison of main ion and impurity rotation velocity	Rotation Physics
109	Phil West	GA	Daily Reference Shot Monitoring of Wall Conditions	Boundary
110	Dmitry Rudakov	UC San Diego	Role of coherent modes on edge pedestal and ELM behavior	Boundary
111	Guiding Wang	UC, Los Angeles	H-mode operation near the threshold power	ITER Demonstration Discharges
112	Phil West	GA	Marginally Limited High Performance Plasmas with Density Control	Core-Edge Integration

ID	Name	Affiliation	Title	Research Area
113	Guiding Wang	UC, Los Angeles	Understanding low density limit for L-H transition power threshold	General IP
114	Richard Groebner	GA	Test of TGLF transport model in pedestal	ELM Control & Pedestal Physics
115	Richard A. Moyer	UC San Diego	Stable Impurity Enhanced Radiative Divertor Operation with Pellet Pacing	Core-Edge Integration
116	John Ferron	GA	Access to betaN = 5 in a high li scenario	Core Integration (Steady-State Scenario)
117	Richard A. Moyer	UC San Diego	Investigating the Limits of Pellet pacing for ELM control	ELM Control & Pedestal Physics
118	John Ferron	GA	NTM stabilization and RMP in high li, high betaN discharges	Core Integration (Steady-State Scenario)
119	John Ferron	GA	Study of moderate beta, high li transport and stability	Core Integration (Steady-State Scenario)
120	Punit Gohil	GA	H-mode power threshold in Hydrogen plasmas	Hydrogen Discharges
121	John Ferron	GA	Reliable, flexible formation of 100% noninductive discharges	Fully Noninductive High Beta Operation
122	John Ferron	GA	ECCD stabilization of NTMs to improve the high beta phase of steady-state scenario discharges	Fully Noninductive High Beta Operation
123	John Ferron	GA	Pursue the q_min >2 path toward high noninductive fraction discharges	Fully Noninductive High Beta Operation
124	John Ferron	GA	Optimize the 6 gyrotron, q_min near 1.5, high noninductive fraction scenario	Fully Noninductive High Beta Operation
125	John Ferron	GA	Discharges with complete 2nd stable regime access	Stability
126	Punit Gohil	GA	Dependence of ELM characteristics on toroidal rotation in hydrogen plasmas	Hydrogen Discharges
127	John Degrassie	GA	Intrinsic rotation vs NTV	Rotation Physics
128	Punit Gohil	GA	RMP ELM-control in hydrogen plasmas	Hydrogen Discharges
129	Eric M. Hollmann	UC San Diego	Study of low-Z pellet shell ablation	Disruptions
130	Chris Holcomb	LLNL	High BetaN, f_BS, ITB plasmas	Fully Noninductive High Beta Operation
132	C. Craig Petty	GA	Momentum Transport Measurement Using Shape Modulation	Rotation Physics
133	Phil West	GA	Net Deuterium Retention In Unpumped and Pumped Discharges on DIII-D and Alcator C-Mod	Hydrogenic Retention
134	Punit Gohil	GA	Characterization of QH-mode and EHO properties with edge toroidal rotation	ELM Control & Pedestal Physics
135	Eric M. Hollmann	UC San Diego	Carbon wall tritium removal using massive hydrogen injection	Hydrogenic Retention
136	Richard A. Moyer	UC San Diego	Completion of MP 2007-01-02: Dependence of Er, turbulence, and transport on RMP amplitude	ELM Control & Pedestal Physics

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138	Punit Gohil	GA	Pellet induced H-mode at low toroidal rotation	Transport
139	C. Craig Petty	GA	Direct Measurement of Momentum Drag from Error Fields	Rotation Physics
140	Punit Gohil	GA	Pellet pacing of ELMs in low toroidally rotating plasmas	ELM Control & Pedestal Physics
141	Todd E. Evans	GA	Enhanced ohmic confinemnt using edge RMPs	Hydrogen Discharges
142	C. Craig Petty	GA	High Beta, Reactor Relevant Hybrid	Core Integration (Advanced Inductive)
143	Oliver Schmitz	FZ Juelich	Particle confinement regimes with RMP in n=3	Transport
144	Oliver Schmitz	FZ Juelich	Resolve deviations between the measured and the EFIT predicted strike point position	Model based Control
145	Oliver Schmitz	FZ Juelich	Resolve impact of mode spectrum on particle transport regimes with RMP	ELM Control & Pedestal Physics
146	Larry R. Baylor	ORNL	Burst Disk Gas Jet for Disruption Mitigation on DIII-D	Disruptions
147	Larry R. Baylor	ORNL	Burst Disk Gas Jet for Disruption Mitigation on DIII-D	Disruptions
148	Ed Lazarus	ORNL	electron transport in sawteeth	Transport
149	Robert J. La Haye	GA	Hybrid beta limit at lower rotation	Rotation Physics
151	Larry R. Baylor	ORNL	Test of Pellet Fueling Fast Transport Theory	General IP
152	Dave Schlossberg	U of Wisconsin, Madison	2D Velocimetry of edge turbulence structures at the LH-transition	Transport
153	Dave Schlossberg	U of Wisconsin, Madison	Simultaneous fluctuation amplitudes measured across the plasma radius in L- and H-mode	Transport
154	Richard Buttery	UKAEA	Tearing Mode Beta Limits and Error Fields in Low Rotation Baseline Plasmas	Rotation Physics
155	Richard Buttery	UKAEA	2/1 NTM beta limits in modest to strong counter torque plasmas	Rotation Physics
156	Richard Buttery	UKAEA	ECCD control of sawteeth and monster sawteeth to avoid NTMs	NTM Stabilization
157	Larry R. Baylor	ORNL	ELM pacing with small pellets	ELM Control & Pedestal Physics
158	Robert J. La Haye	GA	Marginal island for 2/1 NTMs	Stability
159	Morgan Shafer	U of Wisconsin, Madison	Turbulence dynamics of integer q surfaces in near-sationary NCS discharges w/ off-axis ECCD	Transport
160	Morgan Shafer	U of Wisconsin, Madison	Dependence of turbulence and transport on the safety factor and magnetic shear	Transport Model Validation
161	Yongkyoon In	FARTECH, Inc.	Multiple low-n RWM identification and feedback control	RWM Physics
162	Yongkyoon In	FARTECH, Inc.	Can we prevent locked mode from being locked ?	Rotation Physics

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163	Yongkyoon In	FARTECH, Inc.	How to maximize ELM control resources?	ELM Control & Pedestal Physics
164	Yongkyoon In	FARTECH, Inc.	Catastrophic MHD-affiliated non-axisymmetric fields	Error Fields
165	George R. McKee	U of Wisconsin, Madison	Dependence of Turbulence and Transport on Te/Ti in Low Rotation L & H Modes	Transport Model Validation
166	Edward Doyle	UC, Los Angeles	Test theory based models and empirical scaling for intrinsic rotation by changing turbulence modes	Rotation Physics
167	Jose A. Boedo	UC San Diego	Intermittency scaling for ITER	Boundary
168	Larry R. Baylor	ORNL	ELM supression at high density	ITER Demonstration Discharges
169	Thomas W. Petrie	GA	Can the RMP coils eliminate ELMs from SNs with B x gradB out of the divertor?	ELM Control & Pedestal Physics
170	Thomas W. Petrie	GA	Comparison of impurity screening between ELMing and ELM-suppressed plasmas?	ELM Control & Pedestal Physics
171	Richard Buttery	UKAEA	Completion of n=1 RMP ELM control studies	ELM Control & Pedestal Physics
172	Thomas W. Petrie	GA	Is the Radiating Divertor Scenario Compatible With ELM Suppression?	ELM Control & Pedestal Physics
173	Thomas W. Petrie	GA	Compatibility of ELM suppression with the radiating divertor in the hybrids	ELM Control & Pedestal Physics
174	Thomas W. Petrie	GA	What is the nature of the heat flux outside a slot divertor and are particle drifts important?	Thermal Transport in the Plasma Boundary
175	Tony Peebles	UC, Los Angeles	Turbulence & transport modifications in ECH plasmas and comparison to gyrokinetic simulation	Transport Model Validation
176	Robert I. Pinsker	GA	Investigation of fast wave damping at 2nd and 3rd harmonics on injected hydrogen beams	Hydrogen Discharges
177	Thomas W. Petrie	GA	Compatibility of the radiative divertor with high performance plasma operation	Core-Edge Integration
178	Thomas W. Petrie	GA	Optimal location for fueling pumped DN plasmas	Boundary
179	Thomas W. Petrie	GA	Effect of particle drifts on particle exhaust in an ITER-like configuration	Boundary
180	Richard Buttery	UKAEA	Complete ELM suppression with n=2 RMPs	ELM Control & Pedestal Physics
181	Dave Humphreys	GA	Vertical Stability Control Physics for ITER	ITER Startup, Shutdown, Vertical Stability
182	Richard A. Moyer	UC San Diego	Measurement of the electrostatic Reynolds stress across the L-H transition	Transport

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183	Dave Humphreys	GA	Improved Gas Jet Disruption Mitigation by I-coil-Enhanced Impurity Transport	Disruptions
184	Ted Strait	GA	Test of neoclassical toroidal viscosity (NTV) theory for magnetic braking	Rotation Physics
185	Richard A. Moyer	UC San Diego	Completion of MP 2007-01-02: test RMP effect on ELM stability and increase neped with pellets	ELM Control & Pedestal Physics
186	Ted Strait	GA	Role of error fields in resistive wall mode stability	RWM Physics
187	Ted Strait	GA	Stability control and disruption avoidance: initial demonstration of an integrated approach	Disruptions
188	Ted Strait	GA	ELM control with a single row of RMP coils	ELM Control & Pedestal Physics
189	Kenneth Gentle	U of Texas	Model Validation of Electron Transport Using Modulated ECH	Transport Model Validation
190	Thomas A. Casper	LLNL	Assessment of ITER startup with DIII-D similarity shapes	ITER Startup, Shutdown, Vertical Stability
191	Thomas A. Casper	LLNL	Accessibility to AT regimes with ITER-scaled DIII-D shapes	ITER Startup, Shutdown, Vertical Stability
192	Thomas A. Casper	LLNL	ITER controller assessment	ITER Startup, Shutdown, Vertical Stability
193	Kenneth Gentle	U of Texas	Transport Locality and ECH Deposition	Transport
194	Thomas A. Casper	LLNL	Current profile feedback controller verification for AT experiments	Model based Control
195	Robert J. La Haye	GA	ECCD control of 2/1 NTM in ITER q95=3.2 shape	NTM Stabilization
196	Thomas A. Casper	LLNL	Density peaking at low collisionality	ITER Demonstration Discharges
197	Robert J. La Haye	GA	Simultaneous ECCD control of 3/2 and 2/1 NTMs	NTM Stabilization
198	Michio Okabayashi	PPPL	Tearing Mode locking avoidance with toroidal phase advance in the feedback	Disruptions
199	Michio Okabayashi	PPPL	RWM: Mode non-rigidity in low/high rotation plasmas	RWM Physics
200	James D. Callen	U of Wisconsin	Edge Current Control of ELMs	ELM Control & Pedestal Physics
201	Michio Okabayashi	PPPL	Improvement of Dynamic Error Filed Correction by Active MHD Spectroscopy approach in closed feedback	Error Fields
202	Eugenio Schuster	Lehigh U	Development of Model-based Current Profile Control at DIII-D	Model based Control
203	Pete Politzer	GA	Characterization and optimization of H-mode plasmas	ITER Demonstration Discharges
204	Eugenio Schuster	Lehigh U	Model-based Closed-loop Current Profile Control at DIII-D	Model based Control

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205	Pete Politzer	GA	Characterization and optimization of advanced inductive and hybrid plasmas in the ITER configuration	ITER Demonstration Discharges
206	Pete Politzer	GA	Intrinsic rotation and SOL flows	Rotation Physics
207	Pete Politzer	GA	Perpendicular resistivity in Ohm's law	Heating & Current Drive
208	Pete Politzer	GA	Measure the NBCD profile	Heating & Current Drive
209	Lothar Schmitz	UC, Los Angeles	Intermediate/high-k turbulence in electron ITBs and tests of gyrokinetic code predictions	Transport Model Validation
210	Pete Politzer	GA	Effect of loop voltage fluctuations on the pedestal	ELM Control & Pedestal Physics
211	Lothar Schmitz	UC, Los Angeles	Dependence of Zonal Flows on magnetic shear in internal transport barriers	Transport Model Validation
212	Pete Politzer	GA	Burn control simulation	General PCO
213	Punit Gohil	GA	QH-mode in hydrogen plasmas	Hydrogen Discharges
214	Pete Politzer	GA	Flux pumping �?? modulation of the 3/2 NTM in hybrid/AI plasmas by ELMs	Core Integration (Advanced Inductive)
215	Michio Okabayashi	PPPL	The n=3 RFA excitation in the ELM-induced RWM by applying the n=3 extra error field	RWM Physics
216	Lothar Schmitz	UC, Los Angeles	Measurement of Zonal Flows in the H-mode pedestal	Transport
217	Pete Politzer	GA	Is q profile modification the key element in hybrid and advanced inductive plasmas?	Core Integration (Advanced Inductive)
218	Pete Politzer	GA	Minimum rotation for hybrid/AI plasmas	Core Integration (Advanced Inductive)
219	Pete Politzer	GA	Hybrid/AI plasmas rotating in the counter-Ip direction	Core Integration (Advanced Inductive)
220	Michael Van Zeeland	GA	Investigation of Alfvenic Activity and Resultant Fast Ion Transport with Low NBI Power	Energetic Particles
221	Michael Van Zeeland	GA	Investigate Impact of ECH on Alfvenic Activity	Energetic Particles
222	Pete Politzer	GA	Reduced beta hybrid/AI plasmas and the transition to ELM-free VH-mode-like operation	Core Integration (Advanced Inductive)
223	Pete Politzer	GA	Noninductive, high betap plasmas �?? lower q95	Fully Noninductive High Beta Operation
224	Pete Politzer	GA	Noninductive, high betap plasmas �?? broadband MHD and confinement	Fully Noninductive High Beta Operation
225	Michio Okabayashi	PPPL	Edge Ti (rotation) disturbance with residual stable RWM activity	Rotation Physics
226	Guiding Wang	UC, Los Angeles	Density, Bt, and Ip dependence of toroidal rotation effect on L-H transition power threshold	Transport
227	Charles Lasnier	LLNL	Inter-machine comparisons for heat flux scaling	Thermal Transport in the Plasma Boundary

ID	Name	Affiliation	Title	Research Area
228	Michio Okabayashi	PPPL	Optimization of combined Dynamic Error Field Correction and Direct RWM Feedback at Low Rotation	RWM Physics
229	Nikolai Gorelenkov	PPPL	Beam Ion Excitation of Beta Induced Alfvenic Acoustic Eigenmodes	Energetic Particles
230	Anders Welander	GA	Modulated ECCD for 2/1 NTM suppression	NTM Stabilization
231	Steve Allen	LLNL	Hydrogen Confinement at Low Rotation	Hydrogen Discharges
232	Christopher Holland	UC San Diego	Rho-star scan for transport validation studies	Transport Model Validation
233	Steve Allen	LLNL	ELM control in hybrid discharges	ELM Control & Pedestal Physics
234	Christopher Holland	UC San Diego	Mach number scan for transport validation studies	Transport Model Validation
235	Christopher Holland	UC San Diego	nu-star scan for transport validation studies	Transport Model Validation
236	Christopher Holland	UC San Diego	Grad-Ti/Stiffness scan for transport validation studies	Transport Model Validation
237	Steve Allen	LLNL	Feedback Controlled Radiative Divertor	Boundary
238	Christopher Holland	UC San Diego	Search for long-range correlations and non-local behavior in turbulence dynamics	Transport
239	Charles Lasnier	LLNL	Scaling of SOL heat flux	Thermal Transport in the Plasma Boundary
240	Novimir Pablant	UC San Diego	B-Stark Validation Using Deuterium Beams	General IP
241	Robert I. Pinsker	GA	Evaluation of effect of double-layer Faraday screen on rf voltage standoff in ELMing H-mode	Heating & Current Drive
242	George R. McKee	U of Wisconsin, Madison	Beta Scaling of turbulence and transport in low-rotation H-Mode Plasmas	Transport Model Validation
243	Edward Doyle	UC, Los Angeles	Assess sensitivity of ITER demonstration discharges to variations in key physics parameters	ITER Demonstration Discharges
244	Novimir Pablant	UC San Diego	B-Stark Validation Using Hydrogen Beams	Hydrogen Discharges
245	Michael Walker	GA	Real time disruption detection/mitigation	Disruptions
246	Michael J. Schaffer	GA	Improve empirical error correction for right-handed plasmas	Error Fields
247	Andrea M. Garofalo	Columbia U	BetaN=5 for 2 seconds	Core Integration (Steady-State Scenario)
248	Ioan N. Bogatu	FAR-TECH, Inc.	Internal Structure of n=1 MHD Activity in Low Rotation Plasma	Rotation Physics
249	Wayne M. Solomon	PPPL	Determination of intrinsic rotation using torque ramps	Rotation Physics
250	Ron Prater	GA	H-mode transition assisted by edge ECH	Transport

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251	Wayne M. Solomon	PPPL	Dependence of intrinsic rotation on applied error field	Rotation Physics
252	Wayne M. Solomon	PPPL	Test of toroidal momentum pinch model	Rotation Physics
253	Wayne M. Solomon	PPPL	Main ion rotation studies	Rotation Physics
254	Wayne M. Solomon	PPPL	Rotation studies in the absence of Alfven Eigenmodes	Rotation Physics
255	Stefan Muller	UC San Diego	Role of turbulent momentum transport for intrinsic rotation	Rotation Physics
256	Guiding Wang	UC, Los Angeles	Turbulence characteristics in edge pedestal and its correlation with pedestal structure evolution from L-H transition to the first ELM	ELM Control & Pedestal Physics
257	Wayne M. Solomon	PPPL	Poloidal rotation as a function of toroidal rotation	Rotation Physics
258	Guiding Wang	UC, Los Angeles	Measurement of radial profile and radial propagation of density perturbations due to EHO in QH plasmas	ELM Control & Pedestal Physics
259	Wayne M. Solomon	PPPL	Effect of aspect ratio on momentum confinement	Rotation Physics
260	Wayne M. Solomon	PPPL	Poloidal spin up of plasma using off-axis neutral beam injection	Transport
261	Wayne M. Solomon	PPPL	Poloidal rotation comparison between forward & reverse Bt	Transport
262	Ron Prater	GA	Validation of GYRO	Transport Model Validation
263	C. Craig Petty	GA	Direct Measurement of E_rad Corrugation at Rational Surfaces	Transport
264	Guiding Wang	UC, Los Angeles	Simultaneous measurement of density and temperature fluctuation level and radial correlation length in both low and high field side of L-mode plasmas	Transport Model Validation
265	Wayne M. Solomon	PPPL	Poloidal rotation comparison between forward & reverse Ip	Transport
266	Phil Snyder	GA	"burning plasma" control	General PCO
267	Yongkyoon In	FARTECH, Inc.	Eigenmode model-based n=1 RWM feedback control	Model based Control
268	Lei Zeng	UC, Los Angeles	Study of turbulence effects on anomalous particle and momentum pinches	Transport
269	Karl Umstadter	UC San Diego	Enhanced erosion from deuterium saturated materials during ELMs	Hydrogenic Retention
270	Michael J. Schaffer	GA	Simultaneous correction of B-coil bus and F-coil offset errors	Error Fields
271	Phil Snyder	GA	ECH Modification and Control of Pedestal Profiles	ELM Control & Pedestal Physics
272	George R. McKee	U of Wisconsin, Madison	Hydrogen Isotope Scaling of Turbulence and Transport	Transport Model Validation
273	Michael J. Schaffer	GA	Simultaneous correction of B-coil bus and F-coil offset errors	Error Fields

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274	Phil Snyder	GA	Edge current measurement	ELM Control & Pedestal Physics
275	Andrea M. Garofalo	Columbia U	Optimization w.r.t. plasma rotation of the error field correction from I-coil	Error Fields
276	Phil Snyder	GA	Pedestal width in Hydrogen discharges	Hydrogen Discharges
277	Keith Burrell	GA	Test of Neoclassical Toroidal Viscosity theory using modulated I-coil currents	Rotation Physics
278	Zeke Unterberg	ORISE/ORNL	Density pump-out studies in USN divertored, RMP discharges	ELM Control & Pedestal Physics
279	C. Craig Petty	GA	Extrapolation of H-modes and Hybrids to ITER	ITER Demonstration Discharges
280	Matthew Baldwin	UC San Diego	DiMES Investigation of Helium Plasma Induced Nanostructured Morphology on Tungsten	Boundary
281	Jim Leuer	GA	Production of a Mass gradient in DIII-D Discharges	Hydrogen Discharges
282	Michael J. Schaffer	GA	Test J-K Park theory of tokamak error field correction	Error Fields
284	Keith Burrell	GA	Test contribution of edge ion orbit loss to intrinsic toroidal rotation	Rotation Physics
288	Andrea M. Garofalo	Columbia U	Measurement of internal structure of RFA	RWM Physics
289	Keith Burrell	GA	Main ion poloidal rotation measurements in helium plasmas	Rotation Physics
290	Michael J. Schaffer	GA	Develop an L-mode error correction test plasma	Error Fields
291	Keith Burrell	GA	Prompt torque and zonal flow damping	Rotation Physics
292	Michael J. Schaffer	GA	ELM suppression with I-coil error correction	ELM Control & Pedestal Physics
293	Jim Leuer	GA	Minimum Contact Startup in DIII-D	Model based Control
294	Richard A. Moyer	UC San Diego	Search for Structures Predicted in RMP ELM control modeing	ELM Control & Pedestal Physics
295	Michael J. Schaffer	GA	ELM suppression by single-row coil sets	ELM Control & Pedestal Physics
296	Keith Burrell	GA	Test neoclassical poloidal rotation prediction as a function of toroidal rotation speed	Rotation Physics
297	Richard A. Moyer	UC San Diego	Effect of Error Fields and RMPs on H-mode power threshold and transport barrier	Transport
298	Robert I. Pinsker	GA	Balance between FW edge absorption by far-field sheaths and central absorption	Heating & Current Drive
299	Keith Burrell	GA	QH-mode studies as a function of edge rotation	ELM Control & Pedestal Physics
300	Keith Burrell	GA	QH-mode with co-injected neutral beams	ELM Control & Pedestal Physics
301	Michael J. Schaffer	GA	Does RMP ELM suppression have hysteresis?	ELM Control & Pedestal Physics
302	Keith Burrell	GA	Diagnostic spatial cross calibration using edge sweeps in QH-mode	ELM Control & Pedestal Physics

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303	Keith Burrell	GA	RF sustained QH-mode	ELM Control & Pedestal Physics
304	Keith Burrell	GA	Turbulence spreading experiment in plasma core	Transport Model Validation
305	Keith Burrell	GA	Turbulence spreading experiment in the plasma edge	Transport Model Validation
306	Richard A. Moyer	UC San Diego	Completion of MP 2007-01-02: Investigate direct effect of RMP on ELM Stability	ELM Control & Pedestal Physics
307	Michael J. Schaffer	GA	ELM suppression by multi-harmonic RMPs	ELM Control & Pedestal Physics
308	Andrea M. Garofalo	Columbia U	Resonant vs non-resonant braking	Rotation Physics
309	William W. Heidbrink	UC, Irvine	Simple as possible fast-ion transport by TAEs	Energetic Particles
310	William W. Heidbrink	UC, Irvine	Giant sawteeth that never crash	Energetic Particles
311	Masanori Murakami	ORNL	Off-axis NBCD with a small, upward-shifted plasma	Core Integration (Steady-State Scenario)
312	Masanori Murakami	ORNL	test off-axis NBI with a small, upward-shifted plasma	Heating & Current Drive
313	Masanori Murakami	ORNL	Extend full noninductive, high performance operation	Core Integration (Steady-State Scenario)
314	Masanori Murakami	ORNL	ITER steady state scenario demonstration	ITER Demonstration Discharges
315	Michael J. Schaffer	GA	L-mode RMP thermal footprint	Thermal Transport in the Plasma Boundary
316	Ed Lazarus	ORNL	effect of toroidal rotation on sawtooth period	Stability
317	Ed Lazarus	ORNL	localized heating in the sawtooth region in oval plamas	Transport Model Validation
318	Ed Lazarus	ORNL	Bean & Oval Sawteeth without fast ions	Stability
319	Michael J. Schaffer	GA	Stochastic thermal transport in DND	Thermal Transport in the Plasma Boundary
320	Michael J. Schaffer	GA	Control VH-mode density rise by RMP	General FS
321	Ted Strait	GA	RWM feedback control in ITER-like low rotation plasmas	RWM Physics
322	Ted Strait	GA	Dynamic error field control for ITER	Error Fields
323	Keith Burrell	GA	Separating role of E x B and magnetic shear in stabilization of turbulence (DOE Milestone 166)	Transport Model Validation
324	Steven A. Sabbagh	Columbia U	Dependence of non-resonant magnetic braking on nu_i and v_phi profile	Rotation Physics
325	Steven A. Sabbagh	Columbia U	Comparison of RWM stabilization physics in DIII-D and NSTX	RWM Physics
326	Michio Okabayashi	PPPL	Exploring the assumptions built in the RWM models: Hu-Bettie-Manickam and MARS codes	RWM Physics
327	Todd E. Evans	GA	Understanding the role of wall sources and sinks during RMP H-modes	ELM Control & Pedestal Physics

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328	Masanori Murakami	ORNL	Fast wave heating and current drive in AT plasmas	Core Integration (Steady-State Scenario)
329	Masanori Murakami	ORNL	Role of ECCD in sustaining steady state NCS scenario	Core Integration (Steady-State Scenario)
330	Masanori Murakami	ORNL	ITER accessibility to hybrid regime using RF	ITER Demonstration Discharges
331	Masanori Murakami	ORNL	ITB in ITER steady state scenario	ITER Demonstration Discharges
332	Naoyuki Oyama	JAEA	Comparison of high beta_p small ELM regime in DIII-D and JT-60U	ELM Control & Pedestal Physics
333	Terry L. Rhodes	UC, Los Angeles	Turbulence dependence on rho_* via working gas species (Hydrogen and Helium)	Transport Model Validation
334	Mathias Groth	LLNL	Deuterium and carbon SOL flows in USN plasmas using toroidally symmetric CD4 injection	Integrated Modeling
335	Mathias Groth	LLNL	Deuterium and carbon SOL flows in LSN or USN ELM-suppressed H-mode plasmas	Boundary
336	Mathias Groth	LLNL	Effect of core plasma rotation of deuterium and carbon SOL flows	Boundary
337	Mathias Groth	LLNL	Control of SOL flows by Puff & Pump	Boundary
338	Mathias Groth	LLNL	Carbon migration in the divertor using the C13 method	Hydrogenic Retention
339	Mathias Groth	LLNL	Control of the heat and particle flux in radiative divertors	General PCO
340	Todd E. Evans	GA	Low triangularity, low nu*, RMP ELM control	ELM Control & Pedestal Physics
341	Lei Zeng	UC, Los Angeles	Investigation of edge ne profile, fluctuations, and particle transport during RMP	ELM Control & Pedestal Physics
342	Lei Zeng	UC, Los Angeles	Formation and radial propagation of ELM filament structure in DIII-D	ELM Control & Pedestal Physics
343	Steven Lisgo	UKAEA	DiMES: Exposure of CVD diamond film	Boundary
344	Lei Zeng	UC, Los Angeles	Search for the critical ExB velocity shear for ITG and ETG	Rotation Physics
345	Terry L. Rhodes	UC, Los Angeles	Is high-k turbulence a significant contributor to the transport dynamics in the pedestal of H-mode?	Transport
346	Terry L. Rhodes	UC, Los Angeles	Effect of ECH on low, intermediate and high k turbulence during density pumpout	Transport
347	Terry L. Rhodes	UC, Los Angeles	Magnetic shear dependence of low, intermediate and high k turbulence and GK simulation predictions	Transport Model Validation
348	Clement Wong	GA	Testing of VPS-W coating on Cu heat sink from ASIPP	Boundary
349	Tom Osborne	GA	Test of importance of rotation in QH-mode using the I-coil for rotation and density control	ELM Control & Pedestal Physics

ID	Name	Affiliation	Title	Research Area
350	Gerrit J. Kramer	PPPL	Giant Sawtooth control with Alfven Eigenmodes in ITER	Energetic Particles
351	Peter C. Stangeby	GA ,LLNL and U of Toronto	Recovery of D from thick exfoliated C-codeposits mechanically or using localized thermal oxidation	Hydrogenic Retention
352	Gerrit J. Kramer	PPPL	Stabilization of Giant sawteeth by modifying the q-profile.	Energetic Particles
353	Gerrit J. Kramer	PPPL	Stabilization of giant sawteeth through the reduction of the fast particle pressure gradient.	Stability
354	Gerrit J. Kramer	PPPL	The effect of plasma rotation on core-localized Alfven eigenmodes.	Rotation Physics
355	Gerrit J. Kramer	PPPL	Controlling q(0) with Elipticity induced Alfven Eigenmodes in DIIID	Energetic Particles
356	Peter C. Stangeby	GA ,LLNL and U of Toronto	Measuring the contribution of the main wall to tritium retention	Hydrogenic Retention
357	John Ferron	GA	Test the feasibility of operating ITER steady-state scenario demonstration discharges in DIII-D	ITER Demonstration Discharges
358	Terry L. Rhodes	UC, Los Angeles	Te/Ti dependence of low, intermediate and high k turbulence	Transport
359	Tom Osborne	GA	Structure of EHO and Connection to ELM precursor	ELM Control & Pedestal Physics
360	Bejamin F Hudson	LLNL	Variation of Bootstrap Current with Collisionality in the H-Mode Pedistal	Heating & Current Drive
361	Tom Osborne	GA	Scaling of H-mode pedestal width with rhostar	ELM Control & Pedestal Physics
362	Bejamin F Hudson	LLNL	Comparison of Bootstrap Current in ELMing and non-ELMing H-Modes	Heating & Current Drive
363	Bingjia Xiao	ASIPP	Current versus voltage control of plasma shape	General PCO
364	Charles Lasnier	LLNL	Tungsten surface treatments for thermography	Boundary
365	Neil H Brooks	GA	Visualization of 3-D SOL structures in RMP discharges	Thermal Transport in the Plasma Boundary
366	Tom Osborne	GA	Effect of rotation, nonresonant field perturbation, betap, and triangularity on ELM size	ELM Control & Pedestal Physics
367	William R. Wampler	Sandia National Laboratories	Deuterium retention in tungsten	Hydrogenic Retention
368	Dmitry Rudakov	UC San Diego	Dependence of C deposition and D co-deposition rates on the surface temperature	Hydrogenic Retention
369	Dmitry Rudakov	UC San Diego	DiMES Erosion Measurements with Detached Plasmas Induced by Argon Injection	Boundary
370	Francesco Volpe	ORAU	ECRH/ECCD Control of ELMs	ELM Control & Pedestal Physics
371	Francesco Volpe	ORAU	Inducing 3/2 NTMs in hybrid discharges by means of ECRH	Core Integration (Advanced Inductive)

ID	Name	Affiliation	Title	Research Area
372	Francesco Volpe	ORAU	Inducing 3/2 TM or NTM in hybrid discharges by means of modulated ECCD	Core Integration (Advanced Inductive)
373	Francesco Volpe	ORAU	Prompt turn-off of ECCD when no longer required or detrimental for NTM stabilization	NTM Stabilization
374	Francesco Volpe	ORAU	Assess optimal Error Field Correction by modulating I-coils at incommensurable frequencies	Error Fields
375	Francesco Volpe	ORAU	Test of causality: mode rotation vs. plasma rotation	Rotation Physics
376	Ilon Joseph	UC San Diego	RFA assisted RMP-ELM control	ELM Control & Pedestal Physics
377	Francesco Volpe	ORAU	Beta limits for 3/2 NTM onset and locking, as a function of rotation	Rotation Physics
378	Ilon Joseph	UC San Diego	Counter Ip RMP-ELM suppression	ELM Control & Pedestal Physics
379	Ilon Joseph	UC San Diego	Can RMP strike point-splitting spread divertor heat flux?	Thermal Transport in the Plasma Boundary
380	Ilon Joseph	UC San Diego	Calibrate separatrix deformation to ideal response theory	Error Fields
381	Zeke Unterberg	ORISE/ORNL	Rapid-pulse Thomson Scattering scans in initial phase of RMP discharges	Boundary
382	Francesco Volpe	ORAU	Oblique-ECE-assisted MECCD suppression of NTMs	NTM Stabilization
383	Francesco Volpe	ORAU	Simultaneous control of ELMs and RWMs	Core-Edge Integration
384	Francesco Volpe	ORAU	Preferential Locking	General IP
385	Francesco Volpe	ORAU	Sustained rotation of 2/1 for locking prevention, rotational mitigation and to assist ECCD control	NTM Stabilization
386	Phil West	GA	Scaling of peak divertor heat flux and heat flux profile widths during MHD free L-mode operation	Thermal Transport in the Plasma Boundary
387	Clement Wong	GA	Chamber wall materials study	Boundary
388	Tom Osborne	GA	Type II ELMs and the Evolution of Profiles Between Type I ELMs	ELM Control & Pedestal Physics
389	Dave Humphreys	GA	Vertical Stability Control Using C-coil and I-coil	General PCO
390	Matthew Lanctot	Columbia U	Measurement of RFA using the SXR Diagnostic	Error Fields
391	Matthew Lanctot	Columbia U	Optical Sensor for Feedback Control of Resistive Wall Modes	RWM Physics
392	Matthew Lanctot	Columbia U	Resonant and Non-resonant magnetic braking	Error Fields
393	Eric Fredrickson	PPPL	NSTX/DIII-D simularity experiments	Energetic Particles
394	Tom Osborne	GA	High energy confinement, low density Type III discharges and study of Type III - Type I transition	ELM Control & Pedestal Physics
395	Terry L. Rhodes	UC, Los Angeles	Turbulence dependence on rho_* via working gas species (Hydrogen and Helium) (see transport area)	Hydrogen Discharges

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396	Dmitry Rudakov	UC San Diego	ELM interaction with main chamber wall	Boundary
397	Terry L. Rhodes	UC, Los Angeles	New ORNL pellet dropper to modify edge instability drives	Transport
398	Ilon Joseph	UC San Diego	RMP pedestal transport and stability at normal density	ELM Control & Pedestal Physics
399	Phil West	GA	Co-Injected QH-mode access using edge EC/ECCD	ELM Control & Pedestal Physics
400	Edward Doyle	UC, Los Angeles	Continue development of reactor optimized hybrid plasmas	Core Integration (Advanced Inductive)
401	Keith Burrell	GA	Dedicated Experiments to Check Cross Section Correction forCER Rotation Measurements	Rotation Physics
402	Yutaka Kamada	JAEA	Comparison of Rotation Effects on Type I ELMing H-mode in DIII-D�??and JT-60U	ELM Control & Pedestal Physics
403	Shigeyuki Kubota	UC, Los Angeles	Aspect Ratio Scaling of Core Turbulence	Transport Model Validation
404	Yoshiteru Sakamoto	JAEA	QH mode comparison in DIII-D and JT-60U	ELM Control & Pedestal Physics
405	Costanza Maggi	IPP Garching	Role of pedestal on global confinement in hybrid scenario: extend beta range with AUG shape	ELM Control & Pedestal Physics
406	Michio Okabayashi	PPPL	Comparative study of RWM Excitation in low rotation plasmas on JT60U and DIII-D	RWM Physics
407	Andrey Litnovsky	Forschungszentrum Juelich	ITER Mirror performance test. Active control over the deposition on the mirrors by the gas feed.	Boundary
408	Robert Budny	PPPL	Comparisons of L-mode and H-mode in hydrogen and deuterium	ITER Demonstration Discharges
409	Mickey R. Wade	GA	Demonstrate TokSys to Tokamak Capability	General PCO
410	Anthony W Leonard	GA	Pedestal width dependence on Beta	ELM Control & Pedestal Physics
411	Anthony W Leonard	GA	Poloidal Asymmetry of Separatrix heat flux in H-mode	Thermal Transport in the Plasma Boundary
412	Anthony W Leonard	GA	Pedestal Width dependence on Grad-B Direction	ELM Control & Pedestal Physics
413	Anthony W Leonard	GA	RMP ELM suppression dependence on Grad-B drift direction	ELM Control & Pedestal Physics
414	Andrey Litnovsky	Forschungszentrum Juelich	Studies of ITER-like castellation in DIII-D: impact of castellation shape on fuel retention in gaps	Hydrogenic Retention
415	Anthony W Leonard	GA	Rapid pellets for lower density radiative divertor	Core-Edge Integration
416	Ioan N. Bogatu	FAR-TECH, Inc.	RWM n=1 Component Internal Structure in Low Rotation Plasma	RWM Physics
417	Dmitry Rudakov	UC San Diego	Injection of pre-characterized dust in using DiMES	Boundary
418	Francis Perkins	U of Colorado	Does the Pedestasl spin the plasma?	Rotation Physics

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419	Mathias Groth	LLNL	Fluid SOL model validation for helium plasmas	Integrated Modeling
420	Mickey R. Wade	GA	Rotation vs Ion Loss in L-H Transition Threshold	Transport
421	Mickey R. Wade	GA	q95 < 3 Hybrid Plasmas	ITER Demonstration Discharges
422	Dmitry Rudakov	UC San Diego	Monitoring dust levels following entry vent	Boundary
423	T. C. Luce	GA	ITER shutdown with li control	ITER Startup, Shutdown, Vertical Stability
424	T. C. Luce	GA	Test of thermal ion ripple loss as key parameter for L-H transition	Transport
425	T. C. Luce	GA	Extension of advanced inductive domain to lower q95	Core Integration (Advanced Inductive)
426	T. C. Luce	GA	Confinement improvement or degradation with counter injection	Rotation Physics
427	T. C. Luce	GA	High q95 hybrid as a test of current evolution models	Core Integration (Advanced Inductive)
428	T. C. Luce	GA	Bootstrap fraction as a function of q_min	Core Integration (Steady-State Scenario)
429	T. C. Luce	GA	Relative disruption frequency of hybrid and baseline scenario	ITER Demonstration Discharges
430	T. C. Luce	GA	Measure rotation screening of known applied error fields	Error Fields
431	T. C. Luce	GA	Develop method for optimization of error field correction	Error Fields
432	T. C. Luce	GA	Vertical stability of ohmic plasmas in ITER shape	ITER Startup, Shutdown, Vertical Stability
433	Francesco Volpe	ORAU	ELM pacing and suppression by "plasma wobbling" 'a la TCV	ELM Control & Pedestal Physics
434	Francesco Volpe	ORAU	Modulate I-coils to induce edge currents and affect/study ELMs	ELM Control & Pedestal Physics
435	Francesco Volpe	ORAU	Modulate Ip to modulate edge current above/below peeling limit	ELM Control & Pedestal Physics
436	Charles Lasnier	LLNL	Sheath factor measurement in Pisces compared with DIII-D	Thermal Transport in the Plasma Boundary
437	Jose A. Boedo	UC San Diego	Study of turbulence during RMPs	ELM Control & Pedestal Physics
438	Jose A. Boedo	UC San Diego	Momentum transfer across separatrix	Rotation Physics
439	Jose A. Boedo	UC San Diego	SHeath physics studies	Thermal Transport in the Plasma Boundary
440	Michio Okabayashi	PPPL	Plasma startup with compensating n=1(=3) error magnetic field components before the plasma ignition with I-coil feedback	General PCO
441	T. C. Luce	GA	Does the LH threshold go back up with strong ctr-NBI?	Transport
442	T. C. Luce	GA	Rho* scaling of the LH threshold	Transport

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443	T. C. Luce	GA	Run hybrid plasmas to the ideal MHD limit	Core Integration (Advanced Inductive)
444	T. C. Luce	GA	Rho* scaling in hydrogen L mode	Hydrogen Discharges
445	T. C. Luce	GA	Effect of ECCD on sawteeth in H mode	Stability
446	Dean Buchenauer	Sandia National Laboratories	Hydrogen Sensor Diagnostic for DIII-D	Hydrogenic Retention
447	Michael Van Zeeland	GA	Rho* Scaling of Alfvenic Activity Using Hydrogen Discharge	Hydrogen Discharges
448	C. Craig Petty	GA	Sensitivity of ELMs and Particle Control to Triangularity	ITER Demonstration Discharges
449	Jonathan G. Watkins	Sandia National Laboratories	Target Plate Heat flux, sheath power transmission factor, and Power Accounting	Boundary
450	Holger Reimerdes	Columbia U	Search for a window of RWM instability at high rotation	RWM Physics
451	Clement Wong	GA	Systematic study of in-situ boronization	Boundary
452	Clement Wong	GA	Systematic study of in-situ boronization	Boundary
453	Michio Okabayashi	PPPL	Edge Ti (rotation) disturbance with residual stable RWM activity	RWM Physics
454	Michio Okabayashi	PPPL	The n=3 RFA excitation in the ELM-induced RWM by applying the n=3 extra error field	RWM Physics
455	Michio Okabayashi	PPPL	Tearing Mode locking avoidance with toroidal phase advance in the feedback	RWM Physics
456	Michio Okabayashi	PPPL	Improvement of Dynamic Error Filed Correction by Active MHD Spectroscopy approach in closed feedback	RWM Physics
457	Michio Okabayashi	PPPL	Plasma startup with compensating n=1(=3) error magnetic field components before the plasma ignition with I-coil feedback	RWM Physics
458	Tom Jernigan	ORNL	Massive Gas Injection during Ip Rampdown	Disruptions
459	Tom Jernigan	ORNL	Massive Gas Injection of ECH Heated Plasma	Disruptions
460	Edward Doyle	UC, Los Angeles	Performance sensitivity studies of steady-state scenario (low rotation, Te~Ti)	Core Integration (Steady-State Scenario)
461	Richard Groebner	GA	Affect of MHD stability on pedestal width at low triangularity	ELM Control & Pedestal Physics
462	Richard Groebner	GA	Modulated ECH to study pedestal electron thermal transport in ELM-stabilized discharges via RMP	ELM Control & Pedestal Physics
463	Didier J Mazon	CEA Cadarache	Real-time q and Te profile control based on dynamical model approach	Model based Control
464	Matthew Lanctot	Columbia U	Measurement of RFA using the SXR Diagnostic	RWM Physics

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465	Jonathan Yu	UC San Diego	Gas Puff Imaging	Boundary
466	Holger Reimerdes	Columbia U	ECCD stabilization of non-rotating mode in high beta, low-torque plasmas	RWM Physics
467	Francesco Volpe	ORAU	NTM (de)stabilization by co-/ctr-ECCD in island O-/X-point	NTM Stabilization
468	Francesco Volpe	ORAU	Pair formation during disruptions	Disruptions
469	Yubao Zhu	UC, Irvine	Prompt Beam Ion Loss Reduction & Suppression	Energetic Particles
470	Michael Walker	GA	Experimental emulation of ITER port-plug RWM coil asymmetries	RWM Physics
471	Wayne M. Solomon	PPPL	Dependence of core rotation on dRsep	Rotation Physics
472	Edward Doyle	UC, Los Angeles	"Simple as possible" tests of TEM to ITG transitions	Transport Model Validation
473	Rajesh Maingi	ORNL	Comparison of particle and momentum diffusivities and pinches in helium discharges	Rotation Physics
474	Edward Doyle	UC, Los Angeles	L-H transition threshold with ECH induced H-modes	Transport
475	Dmitry Rudakov	UC San Diego	Studies of C deposition and D co-deposition in tile gaps	Hydrogenic Retention
476	Ron Prater	GA	ECCD profile in presence of magnetic island	Heating & Current Drive
477	Phil West	GA	Dust Generation at Tile Leading Edges	Boundary
478	Clement Wong	GA	W Rod Armor Plasma Exposure	Boundary
479	John C. Wesley	GA	Thermal Energy Scan for Helium MGI	Disruptions
480	Lothar Schmitz	UC, Los Angeles	Physics and Power Threshold of Low Rotation L- to H-mode Transitions	Transport
481	Lothar Schmitz	UC, Los Angeles	Physics and Power Threshold of Low Rotation L- to H-mode Transitions	Transport
482	Lang L Lao	GA	Test of resistive MHD linear stability threshold and saturated island structure against models	Integrated Modeling
483	Miklos Porkolab	Mass. Inst. of Technology	Parasitic edge losses during Fast Wave Current Drive and Heating	Heating & Current Drive
484	Jonathan G. Watkins	Sandia National Laboratories	The unexplored SN/DN transition zone in the SOL	Boundary
485	Jonathan G. Watkins	Sandia National Laboratories	Sheath Factor measurement in unbalanced Double Null	Boundary
486	Jonathan G. Watkins	Sandia National Laboratories	RMP fueling effect on pressure profile and ELMs	ELM Control & Pedestal Physics
487	Jonathan G. Watkins	Sandia National Laboratories	Target plate conditions during ELM suppression	ELM Control & Pedestal Physics
488	Anthony W Leonard	GA	Role of pedestal in beta scaling of confinement	Transport
489	Lei Zeng	UC, Los Angeles	Relativistic effects on profile reflectometry and a new potential Te measurement	General IP

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490	Thomas W. Petrie	GA	Optimal Density Control in Double-null and near Double-null High Performance Plasmas	Core-Edge Integration
492	Phil West	GA	Particle balance in hybrid plasmas over a full day of operations with no helium glow conditioning	Hydrogenic Retention
493	C. Craig Petty	GA	Does Intrinsic Rotation Depend on Beam Ions?	Rotation Physics
494	Richard Buttery	UKAEA	RWM thresholds without tearing modes	RWM Physics
495	Richard Buttery	UKAEA	Can n=3 fields raise n=1 error field thresholds?	Error Fields