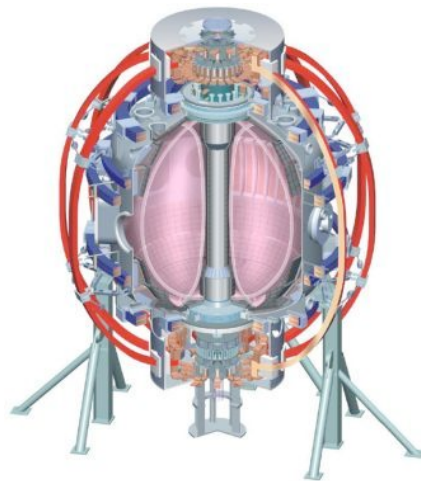


Boundary physics group prioritization

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NSTX Research Forum
Princeton, NJ
Dec. 1-3, 2009

College W&M
Colorado Sch Mines
Columbia U
CompX
General Atomics
INL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Nova Photonics
New York U
Old Dominion U
ORNL
PPPL
PSI
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Washington
U Wisconsin



Culham Sci Ctr
U St. Andrews
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Hebrew U
Ioffe Inst
RRC Kurchatov Inst
TRINITI
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

Boundary Physics TSG priorities are defined by

- **DOE and NSTX Milestones**
 - **FY2010 DOE Joint Research Target:** Conduct experiments on major fusion facilities to improve understanding of the **heat transport in the tokamak scrape-off layer (SOL)** plasma, strengthening the basis for projecting divertor conditions in ITER.
 - **FY2010 Research Milestone R(10-3):** Assess H-mode **pedestal characteristics and ELM stability** as a function of collisionality and lithium conditioning
 - **FY2011 DOE Joint Research Target:** Conduct experiments on major fusion facilities to improve the understanding of the physics mechanisms responsible for the **structure of the pedestal** and compare with the predictive models described in the companion theory milestone.
- **NSTX-U planning needs and ST development path needs**
- **ITPA participation, ITER needs**

Broad participation in boundary physics session

- 33 presentations requesting ~ 33 run days
 - 5 presentations given remotely
 - Two directly from ITER representative
- 3 broad categories
 - physics of H-mode pedestal/ELMs and 3d field effects (21)
 - Several focused on FY10 NSTX and FY11 Joint Research Milestones
 - Divertor and SOL transport, and power loading (10)
 - Couple focused on FY10 Joint Research Milestone
 - Dust studies (2)

Priority and run time allocation by category

CATEGORY	Priority I	Priority II
FY2010 JRT on SOL heat transport	3	0
Divertor and SOL transport, turbulence, sources, flows, and	2	0.5
Dust studies	0	Few hrs
Pedestal and ELMs, including ELM control with RMPs	3	1.5
Total run time:	8	2

NSTX Boundary Physics TSG proposals

- **Pedestal and ELMs, including ELM control with RMPs**

- 1. X. Q. Xu, Controlling the onset of Type-I Elms by rigid-body toroidal rotation via ExB flow shear, 0 day
 - 2. G. McKee, H-mode Pedestal Fluctuation Dynamics in ELM'ing and ELM-free scenarios, 1 day
 - 3. **J.-W. Ahn, Effect of externally applied 3-D fields on divertor profiles, 1 day**
 - 4. J.-W. Ahn, Characterization of ELM heat flux profiles, 1 day
 - 5. J. Canik, Probing the role of homoclinic tangles in the ELM process, 1 day
 - 6. **J. Canik, Density pumpout due to RMPs as a function of collisionality, 0.5 day**
 - 7. **A. Loarte, Effects of ELM control with resonant magnetic perturbation on edge power fluxes between and at ELMs, 2 days**
 - 8. **A. Loarte, Physics processes leading to ELM triggering by vertical jogs and extrapolation to ITER, 1.5 day**
 - 9. **A. Sontag, ELM stability dependence on triangularity, 1-2 days**
 - 10. **D. Battaglia, ELM suppression using 3D fields from a single row off-midplane coils on NSTX, 1 day**
 - 11. D. Battaglia, Imaging the edge island structure in NSTX during the application of 3D fields, 0.5 day or piggyback
 - 12. **A. Diallo, Increasing the Range of Achievable Pedestal Height, 1.5 days** **FY11 JRM**
 - 13. A. Diallo, Correlation of Fluctuations measurements inside the separatrix and GPI, 0.25 day
 - 14. **J.-K. Park, RMP threshold of ELM modification at different q95, 0.5-1 day**
 - 15. R. Goldston, Use of ICRF to Trigger ELMs, 1 day
 - 16. R. Goldston, Use SPAs to Drive EHOs, 1 day
 - 17. **R. Goldston, When Does Core Radiation Affect Confinement, 1 day**
 - 18. R. Goldston, Drive Edge Harmonic Oscillations with Modulated Radio Frequency Heating, 0.5 day
 - 19. **R. Maingi, Dependence of edge profile modification by lithium to proximity to LLD , 1 day** **FY10 NSTX mile.**
- PB 12, 19**
0.5 day
PB 21
PB
0.5 day
ITER
ITER
1 day
ITER
PB 4,6,14
1 day
PB
0.5 day
PB
0.5 day
0.5 day

NSTX Boundary Physics TSG proposals

- **FY2010 JRM on SOL heat transport**

3 days

21. R. Maingi, Measurements of heat flux profiles for the FY2010 Joint Research Milestone, 5 days
22. R. Maqueda, GPI based research in support of the 2010 edge JRT milestone, 0.5 day

- **Divertor and SOL transport, turbulence, sources, flows, and heat flux mitigation**

0.5 + 0.5

23. V. A. Soukhanovskii, Divertor heat flux reduction and detachment studies with impurity seeding and LLD pumping for NSTX-U, 1 day

1 day

24. V. A. Soukhanovskii, Snowflake divertor characterization in NSTX, 1 day

PB

25. A. McLean, Simple As Possible Plasmas (SAPP) on NSTX, 1 day
26. A. McLean, Regular Spectroscopic Characterization of the LLD, 0.5 day
27. A. McLean, Spectroscopic characterization of molecular sources in NSTX, 1 day

0.5 day

28. S. Zweben, Test of LLD Electrodes for SOL Control, 0.5 day

29. N. Nishino, Two dimensional ion flow measurement, 0 days
30. M. A. Jaworski, Turbulence and divertor target plasma characterization during transition to sheath-limited regime, 0 days
31. A. Pigarov, Study of secondary electron emission and thermoelectric current effects with Li, 0.5 day

PB 21

- **Dust studies**

Few hrs

32. C. H. Skinner, Dust Mobilization studies with PMI probe, 0.25 day+piggyback
33. R. D. Smirnov, Modeling of dust trajectories and radiation mantle, 0.25 days