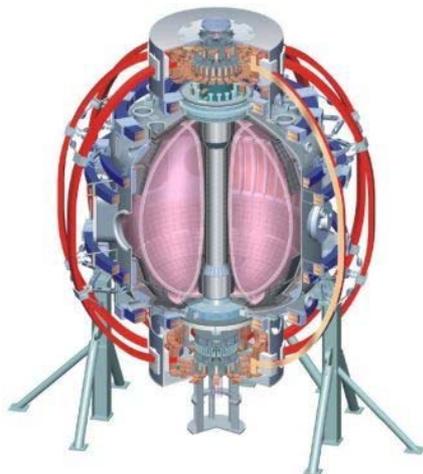


Transport and Turbulence TSG Summary

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FY11-12 Research Forum
March 15-18th, 2011



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
TRINITY
KBSI
KAIST
POSTECH
ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

College W&M
Colorado Sch Mines
Columbia U
CompX
General Atomics
INEL
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

Transport and Turbulence Prioritization Based on:

- **NSTX FY2011 research milestone R(11-1): Measure fluctuations responsible for turbulent electron, ion and impurity transport**
- **FY2012 Office of Fusion Energy Sciences 3 Facility Joint Research Milestone:**
 - The work will emphasize simultaneous comparison of model predictions with experimental energy, particle and impurity transport levels and fluctuations in various regimes, including those regimes with significant excitation of electron modes
- **NSTX ITPA participations**

Transport & Turbulence XP Summary

- 24 XPs received at T&T TSG (23 presentation given, 4 remotely)
 - 15 XPs: 1st priorities; 8 XPs: 2nd priorities; 1 XP: other
 - NSTX R11-1 and 2012 JRT are adequately covered
 - Request: 26.8-29.3 days with a minimum of 18.5-19.5 days
 - The run time guidance: 8 days for 1st priority; 2 days for 2nd priority.
- A broad range of physics topics:
 - Multi-channel transport: 1 group XP for 2012 JRT
 - Particle and impurity transport: 3 XPs
 - Electron thermal transport: 9 XPs
 - Ion scale turbulence: 2 XPs
 - L-H physics: 4 XPs
 - GAM physics: 1 XP
 - Intrinsic rotation: 2 XPs
 - Confinement scaling: 1 XP
 - Other: 1 XP

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- A broad range of physics topics:
 - Multi-channel transport: 1 group XP for 2012 JRT 4 days (1st priority)
 - Particle and impurity transport: 3 XPs with group XP
 - Electron thermal transport: 9 XPs 4 days (1st priority)
 - Ion scale turbulence: 2 XPs Combined
 - L-H physics: 4 XPs 1 day (2nd priority)
 - GAM physics: 1 XP 0.5 day (2nd priority)
 - Intrinsic rotation: 2 XPs 0.5 day (2nd priority)
 - Confinement scaling: 1 XP 0 day
 - Other: 1 XP 0 day

T&T Run Time Allocation

| Cat. | XP No. | Name | Title | Req uest | Min. | FY11 1st | FY11 2nd | FY12 1st | FY12 2nd | Combine |
|------------------------|--------|---|--|--------------|------------------|------------------|-------------|-------------|-------------|-----------------------|
| 1st Priority XPs | TT1 | Kaye | Multi-channel transport and related microturbulence (group XP) | 3-4 | 3-4 | 2 | | 2 | | |
| | TT3 | Kubota | Particle Transport Using Gas Puff Modulation | 2 | 2 | | | | | TT1 |
| | TT5 | Soukhanovskii | Development of diagnostic method and perturbative gas injection techniques for impurity, ion and electron heat transport studies | 0.5 | 0.5 | | | | | TT1 |
| | TT6 | Clayton | Impurity Transport Measurements in the NSTX Plasma Edge | 1 | 0.5 | | | | | TT1 |
| | TT8 | Mazzucato | ETG Turbulence and Anomalous Transport in NSTX | 2 | 1 | 0.5 | | | | |
| | TT9 | Ren | ExB Shear Effect on Micro-turbulence in L and H mode plasmas | 1 | 0.5 | | | | | TT1 |
| | TT10 | Ren | Assessing the 2D k spectrum of high-k turbulence | 1 | 0.5 | | | 0.5 | | |
| | TT11 | Guttenfelder | Collisionality scaling of turbulence at high beta | 1-2 | 1 | 1 | | | | |
| | TT13 | Smith | Assessment of core low-k turbulence and poloidal flow fluctuations | 2 | 1 | | | | | TT11 |
| | TT14 | Smith | ETG turbulence in the k-theta, k-r plane | 0.5 | 0.5 | | | 0.5 | | |
| | TT16 | Tritz | GAE effects on electron thermal transport | 1 | 0.5 | | | 0.5 | | |
| TT17 | Yuh | Measurement of residual turbulence in ITBs and explaining the high-k bursts | 1 | 1 | 0.5 | | 0.5 | | | |
| 2nd Priority XPs | TT2 | Kaye | L-H Threshold Power Study: Ramp-Up vs Steady Ip Phase | 1 | 1 | | 1 | | | |
| | TT4 | Kubota | Search for GAMs Using Doppler Backscattering | 1 | 0 | | | | 0.5 | |
| | TT24 | Solomon | Characterization of intrinsic torque and rho* scaling | 1 | 1 | | | | 0.5 | |
| | TT7 | Munsat | Dynamics of Zonal Flow-Drift Wave System Preceding L-H Transition | 0.5 | 0.5 | | | | | piggyback on boundary |
| | TT12 | Guttenfelder | Polarimetry measurements of microtearing turbulence | .5-1 | 0.5 | | | | | piggyback |
| | TT18 | Lee | Measurement of density fluctuation for the study of transport and L-H power thresholds | 1 | 1 | | | | | piggyback on L-H XPs |
| | TT15 | Hosea | Turbulence Characteristics for HHFW Saturated Stored Energy versus RF Power | 1 | 0.5 | | | | | |
| | TT19 | Battaglia | L-H power threshold for D and He plasmas using RF current drive with symmetric phasing | 1 | 1 | | | | | |
| | TT20 | Lore | Effect of Radiated Power Fraction on Divertor Power Load and Core Confinement | 1 | 0.5 | | | | | |
| | TT21 | Park | Intrinsic rotation in Ohmic L-mode and H-mode plasmas | 0.75 | 0.5 | | | | | |
| | TT22 | Petty | Aspect Ratio Scaling of Transport With DIII-D | 1 | 0.5 | | | | | |
| | TT23 | McKee | Dependence of Low-k turbulence properties on rho* in the ST | 1 | 0.5 | | | | | |
| | | | | total | 26.8-29.3 | 18.5-19.5 | 4 | 1 | 4 | 1 |

2012 JRT Targeted Group XP Receives Highest Priority

- (TT1) Multi-channel transport and related micro-turbulence (Kaye)
 - 4 1st priority days including scoping and experimental time
 - Directly targets 2012 JRT and also NSTX R11-1
 - A T&T group effort
- The following XPs are included in the group XP:
 - (TT3) Particle Transport Using Gas Puff Modulation (Kubota)
 - (TT5) Development of diagnostic method and perturbative gas injection techniques for impurity, ion and electron heat transport studies (Soukhanovskii)
 - (TT6) Impurity Transport Measurements in the NSTX Plasma Edge (Clayton)
 - (TT9) ExB shear effect on micro-turbulence in L and H mode plasmas (Ren)

Electron Thermal Transport Study also Strongly Supported with 1st priority

- (TT8) ETG Turbulence and Anomalous Transport in NSTX (Mazzucato) 0.5 day
- (TT10) Assessing the 2D k spectrum of high-k turbulence (Ren) and (TT13) ETG turbulence in the k-theta, k-r plane (Smith) 1 day
- (TT17) Measurement of residual turbulence in ITBs and explaining the high-k bursts (Yuh) 0.5+0.5 day
- (TT11) Collisionality scaling of turbulence at high beta (Guttenfelder) 1 day
 - including (TT13) Assessment of core low-k turbulence and poloidal flow fluctuations (Smith)
- (TT16) GAE effects on electron thermal transport (Tritz) 0.5 day

2nd Priority XPs are also Supported

- (TT2) L-H Threshold Power Study: Ramp-Up vs Steady Ip Phase (Kaye) 1 day
- (TT4) Search for GAMs Using Doppler Backscattering (Kubota) 0.5 day
- (TT24) Characterization of intrinsic torque and ρ^* scaling (Solomon) 0.5 day