




# Transport & Turbulence ITPA Joint Activities

Leader: Stan Kaye  
Deputy: Kevin Tritz

and the T&T TSG working group

*GOAL: To identify and prioritize NSTX contributions for the IEA-ITPA Joint Experiment Planning Meeting and for the upcoming 2009 NSTX run.*



# High Priority Research Tasks 2008-2009

## Proposed by Transport Task Group:

Develop an improved characterization of the L-H transition threshold

Global Confinement

Particle and impurity transport

Electron transport:

Ion thermal transport

Momentum transport and plasma rotation:

Barrier formation

Model validation

## Requested by ITER Organization:

- o Access to the H-mode in the non-active phase is problematic, with significant implications for overall structure of the ITER Research Plan: Timescale ~2 years
  - Robust H-modes probably not achievable in hydrogen plasmas
  - Confirmation of recent results from helium H-mode studies in JET (PLH,He ~ 0.7 PLH,H), would open access to H-mode operation in the non-active phase

# Present & Future Transport Joint Activities

- CDB-2      Beta Degradation (Kaye) - [use Li for ELM-free scaling studies](#)
- CDB-9      Density profiles at low collisionality (LeBlanc?) - [study density profiles & peaking during Li operation](#)
- CDB-10     Power ratio - Hysteresis and access to H-mode with H~1
- CDB-11     Scaling of the low density limit to the H-mode threshold in H&D ([He?](#)) plasmas (Stewart) - [modify task to address IO request? Develop physics understanding for more confident scaling](#)
- TP-3.2     Determine transport dependence on Ti/Te ratio in L-mode plasmas (Yuh) - [continue e<sup>-</sup> transport studies in RF-heated L-mode plasmas](#)
- TP-4        Transport dependence of high performance operation on low external momentum input (Hosea) - [address using high performance RF discharges \(pending RF results\)](#)
- TP-6.1     Scaling of spontaneous rotation with no external momentum input (R. Bell?) - [Ohmic/RF & ERD](#)
- TP-6.3     NBI-Driven momentum transport study (Kaye/Solomon) - [use beam blips/magnetic braking](#)
- TP-9        H-mode aspect ratio comparison (Tritz) - [similarity XP with DIII-D, also important for ST scaling](#)

## New proposals:

Stutman - joint machine investigation of magnetic fluctuation & shearing AE effect on electron thermal transport

Hahm - influence of residual stress on intrinsic rotation and momentum transport

Delgado - introduce impurity transport joint activities

Lee - effect of neutral penetration on L-H threshold, comparison to developing theory

*[Further prioritization needed for NSTX 2009 run \(research forum\)](#)*