

ITPA Tasks and XP Ideas

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NSTX Research Forum

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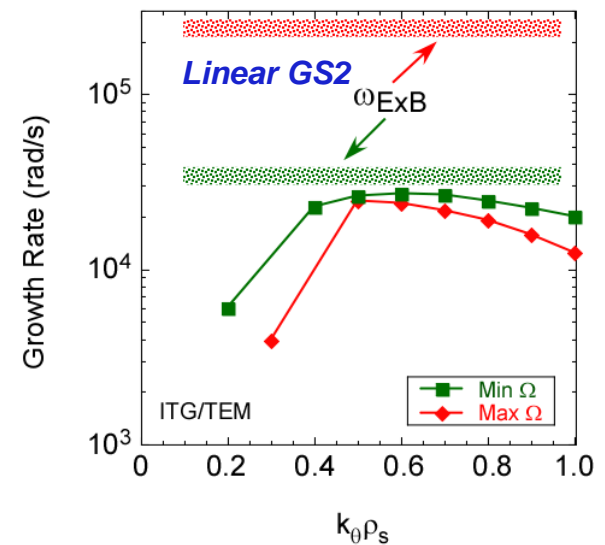
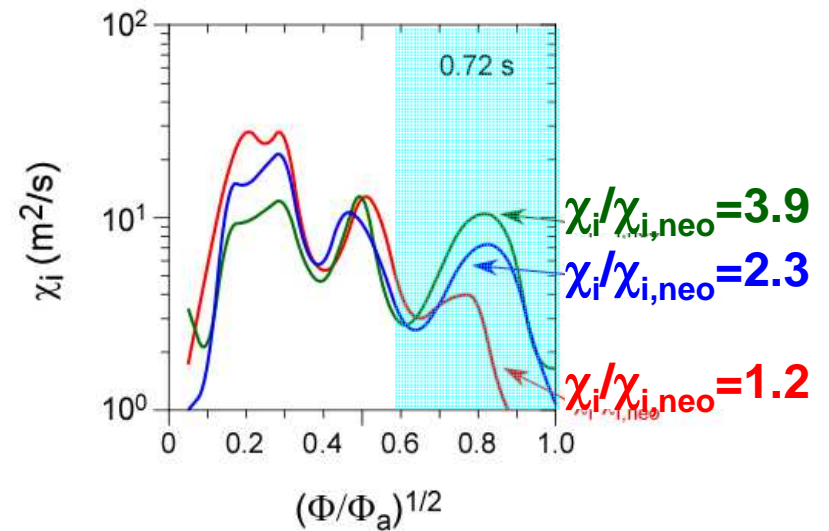
ITPA T&C Joint Expts/Activities

- ***TC-1 Confinement scaling in ELMy H-modes: beta degradation***
 - *NSTX pretty much done with this for phenomenology*
 - *Turbulence measurements (high-k and BES) desired*
- ***TC-2 Power ratio - hysteresis and access to H-mode with H~1***
 - *Work done last year*
- ***TC-3 Scaling of the Low-Density Limit of the H-mode Threshold***
 - *Not a strength for NSTX*
- ***TC-4 H-mode transition and confinement dependence on ionic species***
 - *Work done last year*
- ***TC-9 Scaling of intrinsic plasma rotation with no external momentum input***
 - *Want to explore (HHFW)*
- ***TC-10 Experimental identification of ITG, TEM and ETG turbulence and comparison with codes***
 - *Ongoing: High-k, BES important*
- ***TC-12 H-mode transport and confinement at low aspect ratio***
 - *Ongoing; effect of Lithium (collisionality) on confinement*
- ***TC-15 Dependence of momentum and particle pinch on collisionality***
 - *Experiments performed last year*
 - *Would like low-k turbulence*

XP1: Impact of rotation on turbulence and energy and momentum transport (Kaye, Solomon, Smith et al.)

Part I – Ion Energy Transport

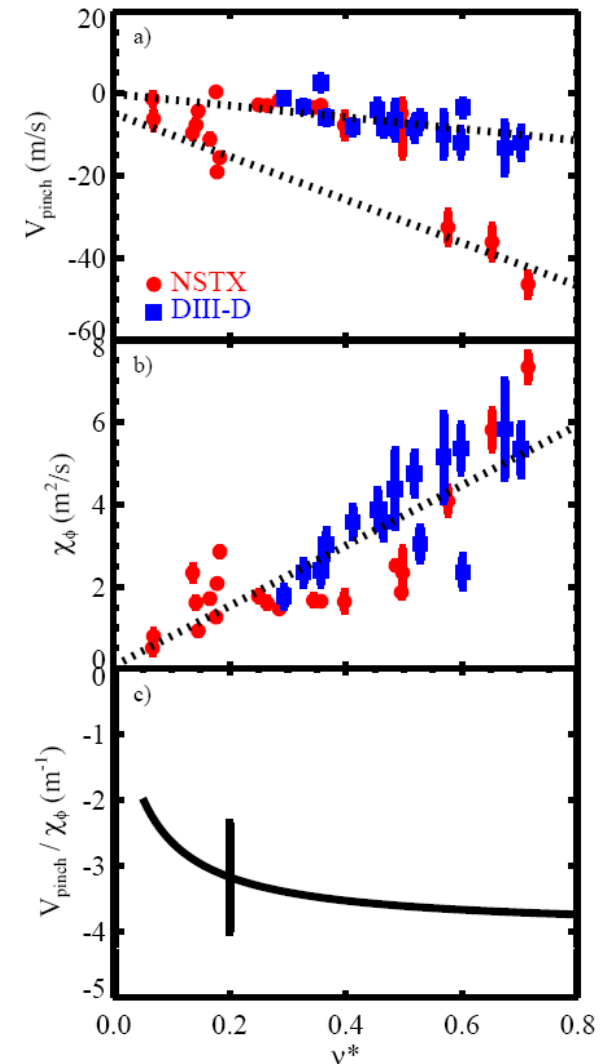
- Kaye et al. (IAEA2008) showed the relation between rotation and ion thermal transport
- Expect more anomalous ion transport at lower levels of rotation
- Would like to repeat this experiment and link to measurements of low-k turbulence with BES (TC-10)
- Use n=3 braking (steady) to obtain different rotational equilibrium
- ~1 day



XP1: Impact of rotation on turbulence and energy and momentum transport ***(Kaye, Solomon, Smith et al.)***

Part II – Momentum Transport

- Solomon, Kaye et al. (2008) have shown a relation between inferred momentum pinch and that predicted by theory based on low-k turbulence
- XPs run last year (Solomon et al.) have shown the dependence of momentum pinch and diffusivity on collisionality
- Is this related to the character and changes in low-k turbulence (TC-15)?
- Use n=3, NBI pulses
- ~1 day



XP2: Density dependence of L-H threshold power

- L-H expts last year using RF appeared to show some dependence of the threshold power on density
- Important for determining hysteresis, scaling, etc (TC-2, 4)
- Dedicated NBI experiments last year attempted to explore this, but found MHD events at late NB turn on times clouded the interpretation
- Would like to redo with RF and/or NBI to reach conclusion
- ~1/2 day

XP3: I-Mode

- Access
 - Unfavorable drift direction
 - Strong shaping
 - Low- q_{95}
 - Powers lower than threshold power
- Benefits
 - Good confinement
 - L-mode edge: low particle confinement, no impurity accumulation
 - Huge benefit for ITER
- Data mining from reversed B_T experiments
 - Possible $\frac{1}{2}$ day scoping experiment in collaboration with C-Mod