

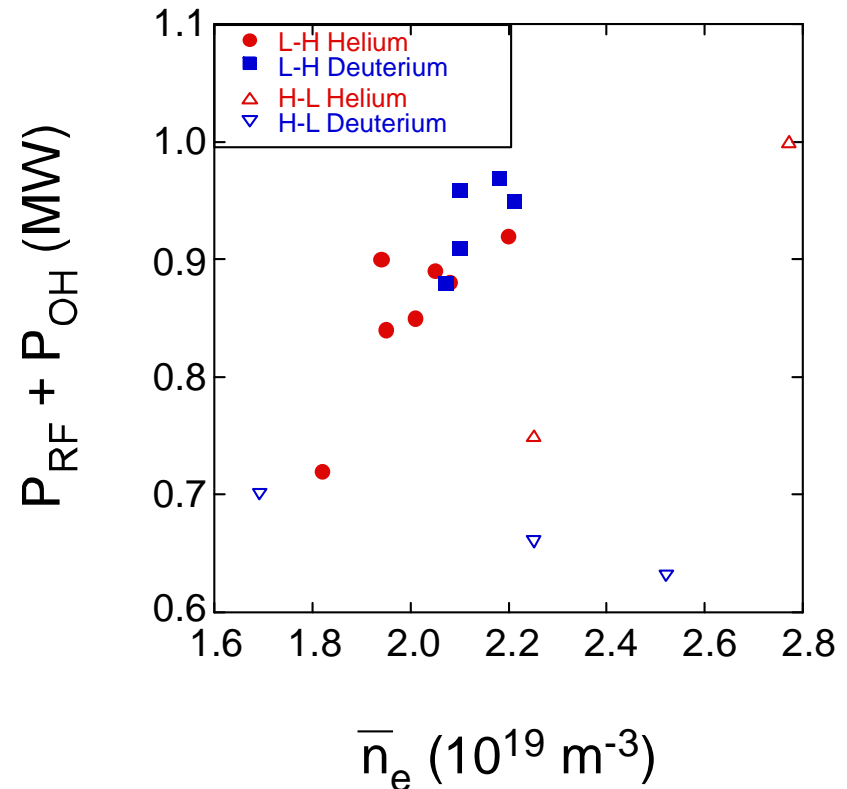
T&T XPs

S. Kaye

3/4/10

XP1028 Density Dependence of L-H Threshold

- Knowing the n_e dependence of P_{LH} is important for interpreting the P_{LH} dependence on other parameters (where density could be different at time of transition)
 - Lithium
 - Applied $n=3$ fields, etc
- HHFW experiments have indicated a possible near linear dependence of P_{LH} on density
 - Not inconsistent with $n_e^{0.7}$ dependence from conventional P_{LH} scalings
- Need to confirm dependence with dedicated scan



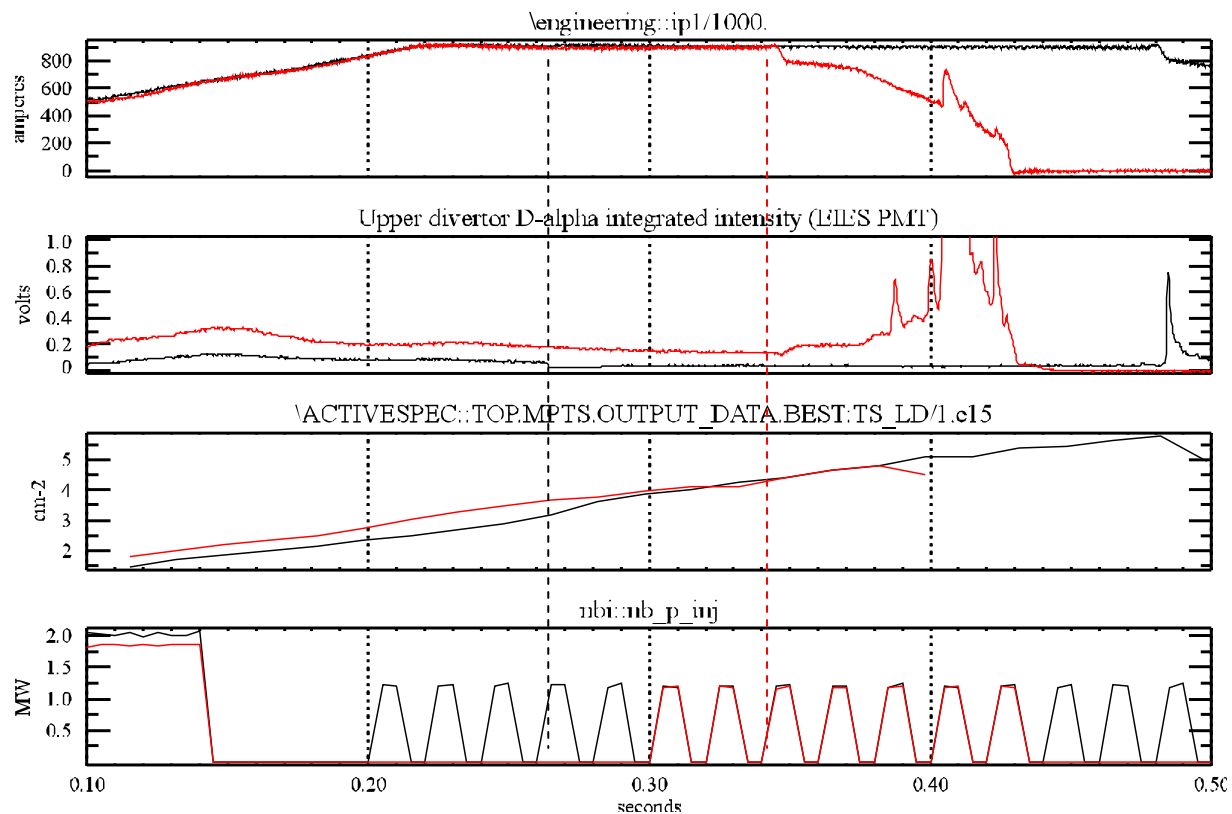
Two-point scan was attempted last year

- Beam power brought on later during current flattop, at higher density
 - Resulted in some sort of mode causing current drop out, coincident with D_a drop
 - Not a clean L-H transition (most likely not even a transition)

Shots:

132958

132971



Experimental Plan (~1/2 day)

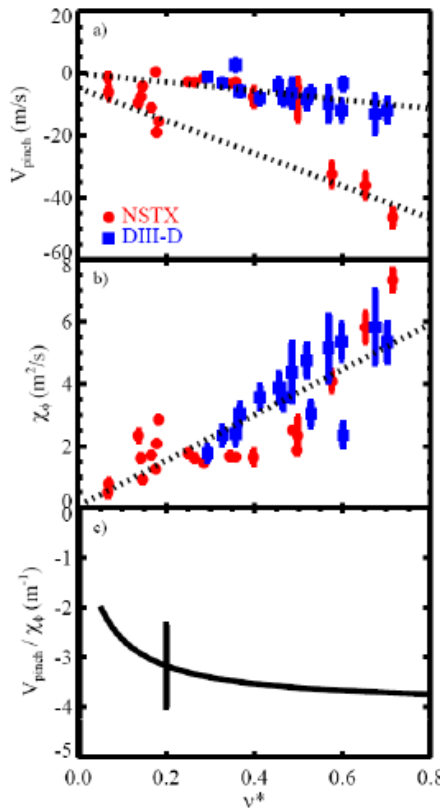
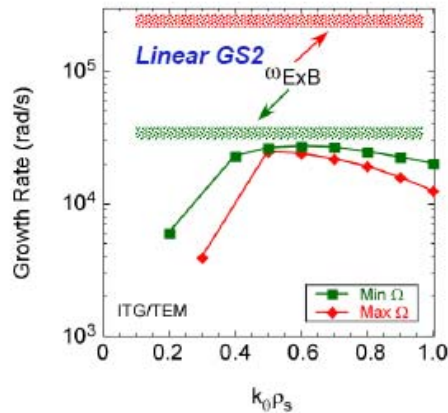
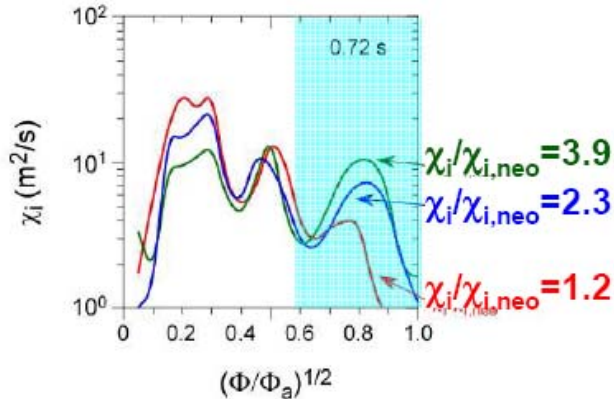
- Redo experiment changing the beam on time
 - Use same baseline discharges (132958) if possible
 - Cold LLD, but with LITER evap to reproduce conditions
 - Start with beam on time at 0.2 s (132958)
 - Move beam on time back 0.05 ms to begin (not as large a density increment)
- If current drop still a problem, retrench and perform with HHFW, changing the HHFW on time
 - Use 135293 as baseline shot (D⁺ shot for species dependence scan); similar Li conditioning (~5-10 mg/min)
 - Change HHFW timing (delay) to get as large a density range as possible
 - Will need > 4MW HHFW power available

XP1035 Impact of turbulence on energy and momentum transport

Ion transport more anomalous with lower rotation shear

Pinch believed to be driven by low-k turbulence

- Low-k turbulence measurements critical for understanding variation of energy and momentum transport
- Studies performed using steady or pulsed n=3 field application

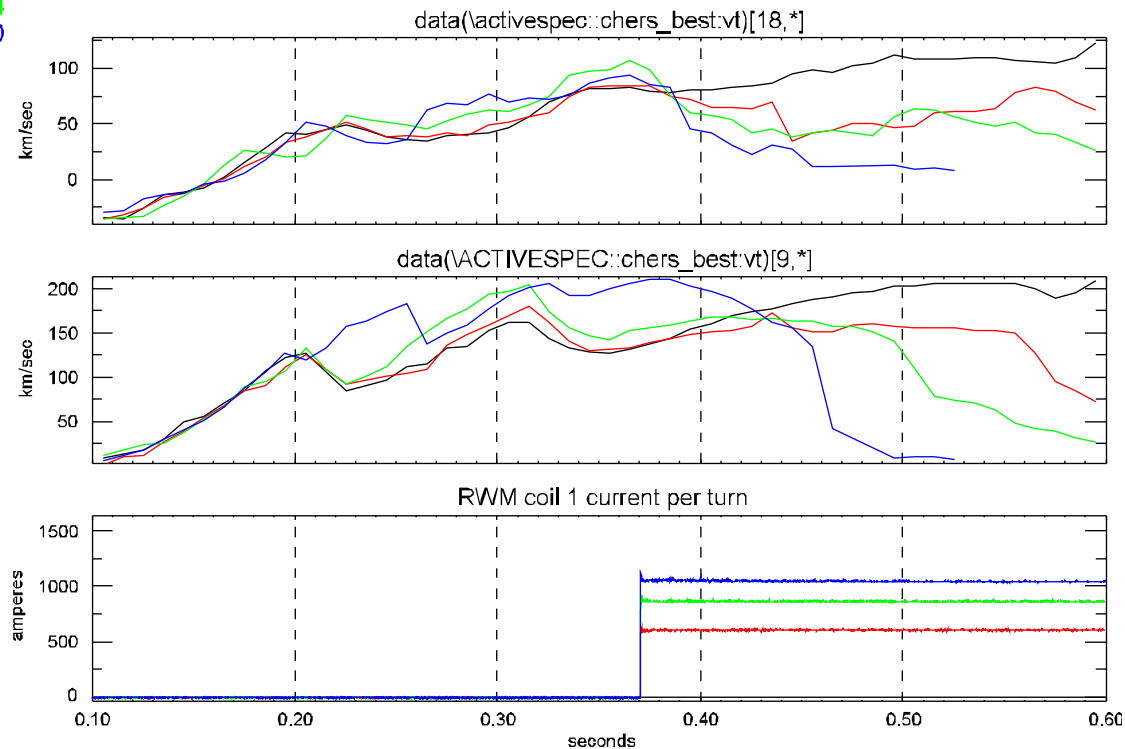


Experimental Plan (Part I)

- Ion transport (~1/2 day)
 - Repeat scan performed in 2007 varying steady $n=3$ fields to change rotational shear (use 123182, or similar, as baseline)



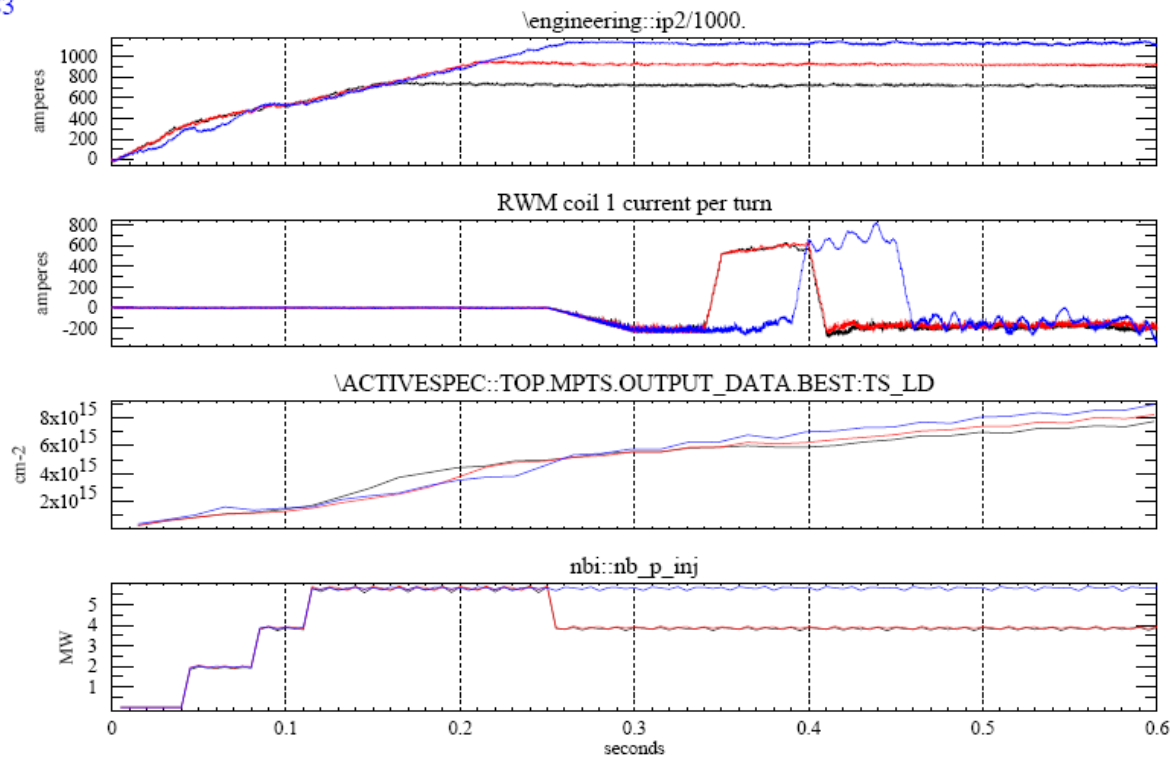
Shots:
123182
123188
123184
123180



Experimental Plan (Part II)

- Momentum transport (~1/2 day)
 - Repeat 2009 collisionality scan (vary I_p and B_T , keeping I_p/B_T fixed)
 - Fixed power
 - Apply 50 ms $n=3$ pulses (at same time)

Shots:
134790
134779
134783



Requirements

- Turbulence diagnostics required
 - BES (critical to assess validity of linear gyrokinetic theory/ E_r shear suppression & momentum pinch explanations)
 - High-k, reflectometry important (but not as critical)
- Desire cold LLD, with LITER evaporation as previously for these baseline discharges