

L-H power threshold versus lithium deposition and LLD temperature

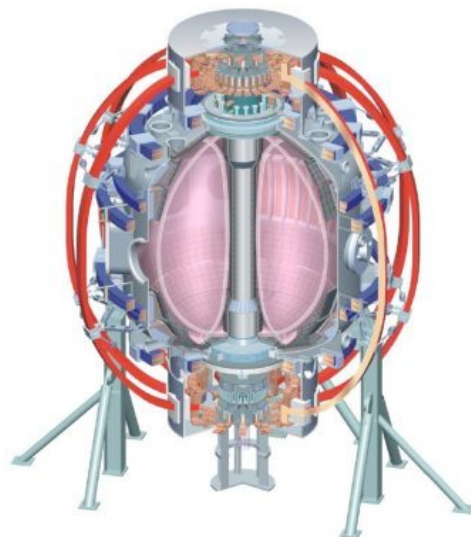
D.J. Battaglia^{1*}, T. Gray¹, R. Maingi¹,
S. Kaye²

¹ Oak Ridge National Laboratory, Oak Ridge, TN

² Princeton Plasma Physics Laboratory, Princeton, NJ

* Participant in the U.S. DOE Fusion Energy Postdoctoral
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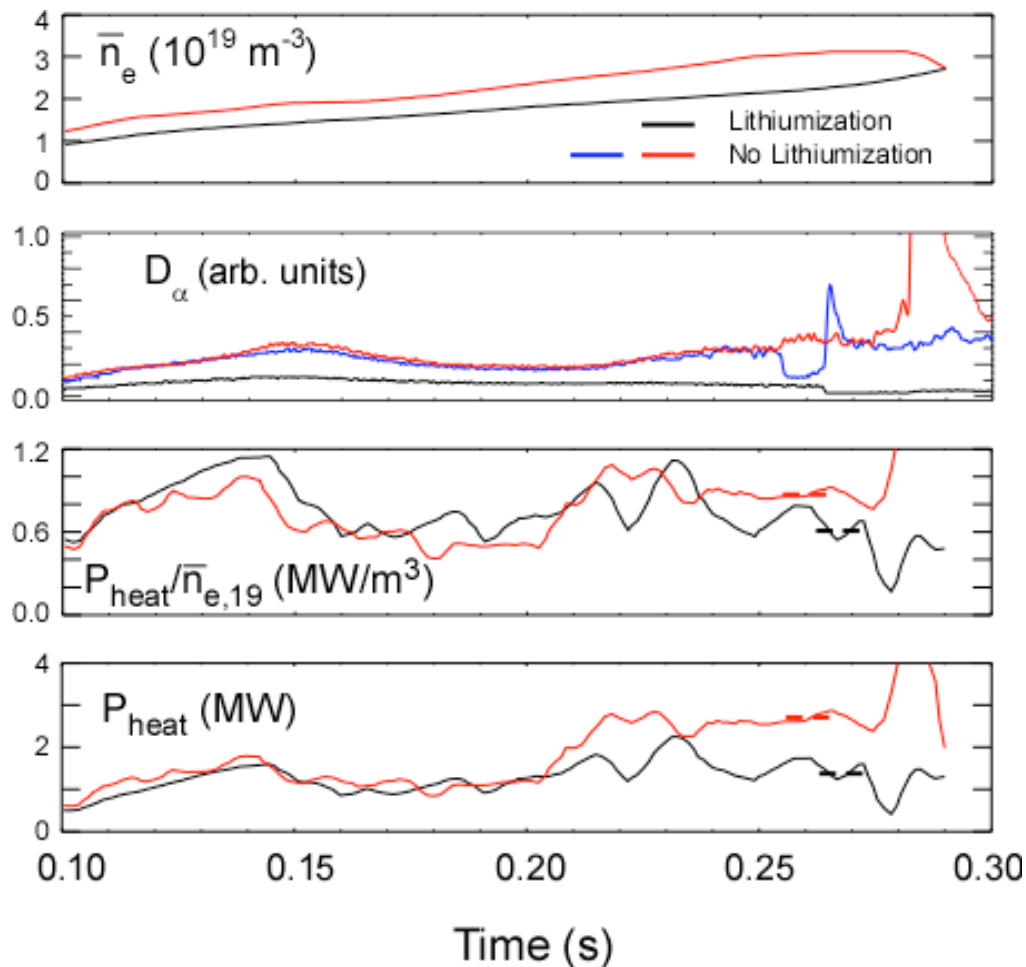


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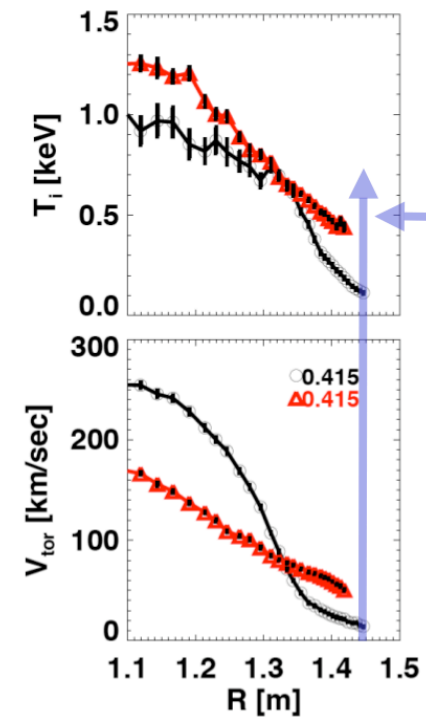
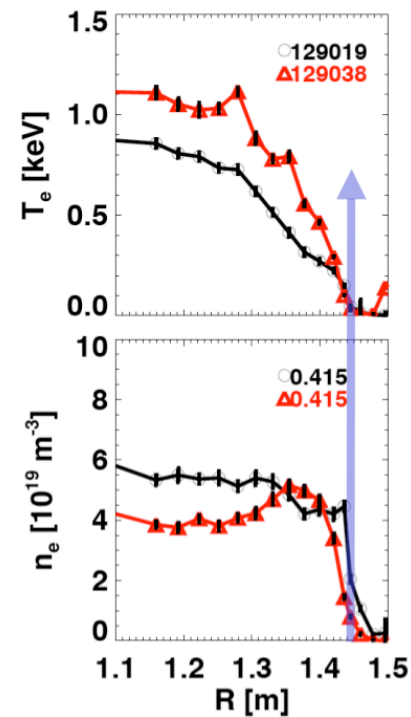
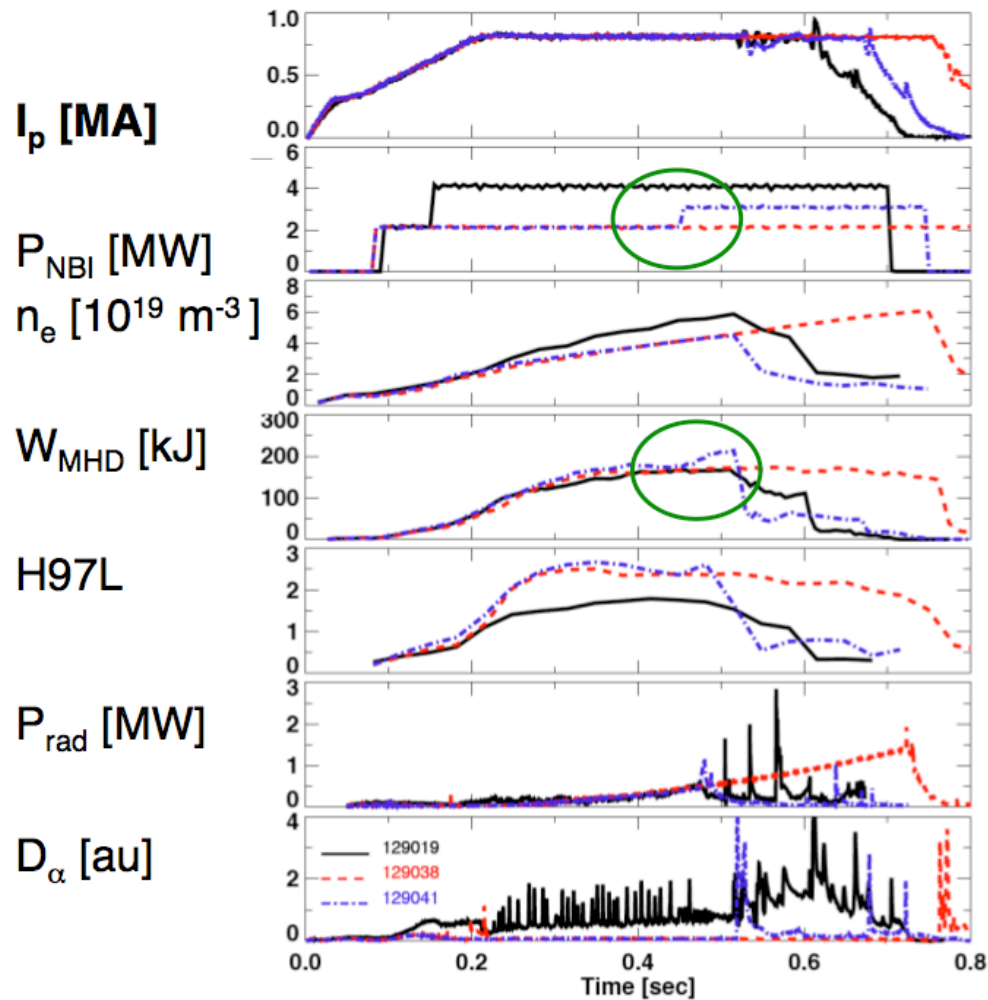
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Reduction in P_{LH} observed with lithium wall conditioning

$P_{LH} \sim 2.7$ MW NBI without Li evaporation ($P_{heat}/n_e \sim 0.9$ MW/ 10^{19} m 3)
 ~ 1.4 MW NBI with Li evaporation (0.6 MW/ 10^{19} m 3)



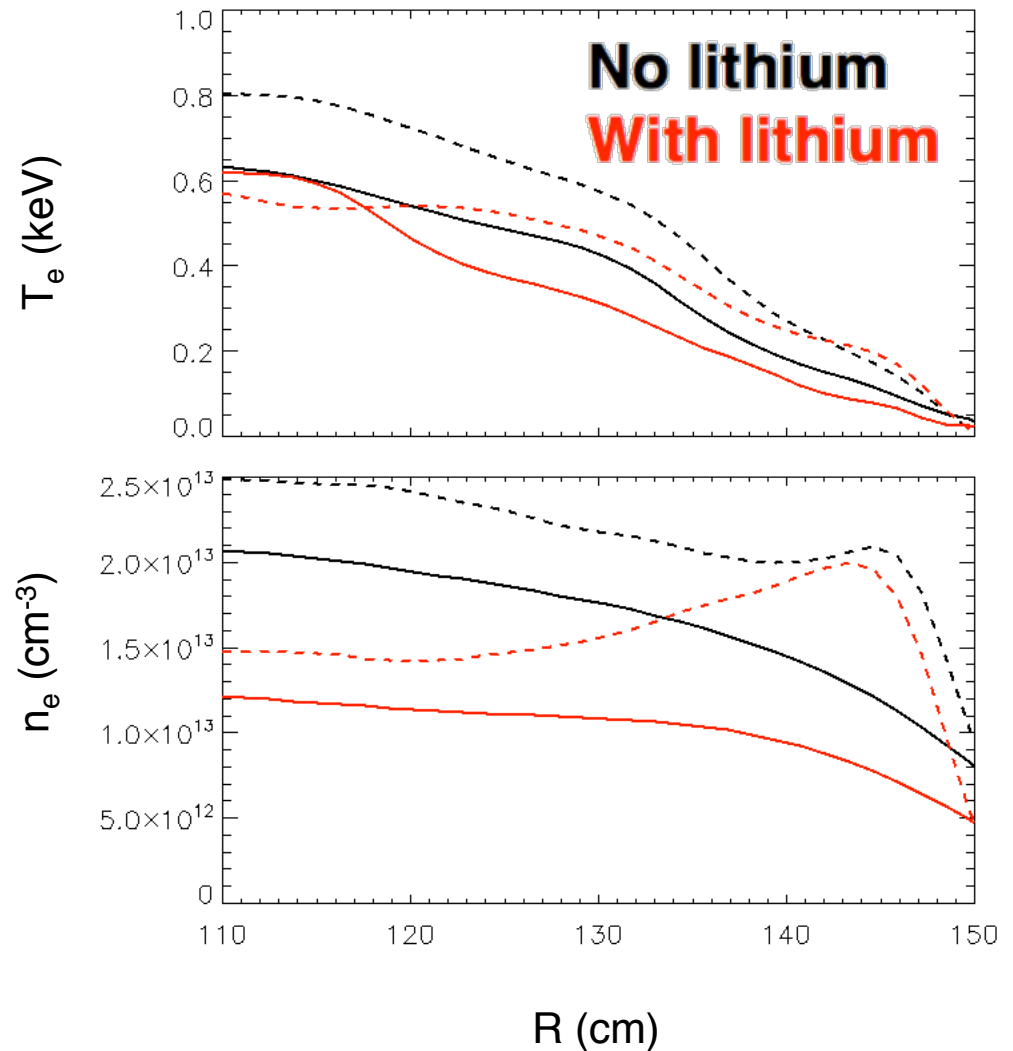
Li pumping significantly alters the plasma profiles in H-mode



No lithium
With lithium

Edge T_e profile is similar near L-H transition despite factor of 2 difference in P_{NBI}

- L-H transition
 - No Li: $t \sim 0.20$, 4 MW NBI
 - Li: $t \sim 0.16$, 2 MW NBI
 - During I_p ramp when profiles quickly evolving
- T_e profiles similar near transition
 - $n_e \sim$ factor of 2 difference
 - P_{LH}/n_e similar
 - May support theory of a T_e threshold
 - ... but global parameters not matched



Propose dedicated XP to quantify P_{LH} versus lithium deposition and LLD temperature

- Edge pumping control with Li presents opportunity to vary edge profiles and P_{LH} while maintaining constant global parameters: I_p , B_t , S , and n_e
 - Supports ITPA PEP-26 proposal to examine key local parameters at time of transition
 - Also interested in GPI / high-k turbulence at time of transition
 - TC-12: Effect of collisionality on H-mode confinement
- Propose 1 dedicated day or dedicated discharges spread throughout campaign as LLD becomes loaded
 - Constant shape, x-point position, I_p , B_t , S (and n_e if possible)
 - Vary P_{NBI} to find P_{LH}
 - Scan pre-shot lithium deposition
 - Scan LLD temperature with constant lithium loading
 - Could piggy-back with experiments that want to operate near P_{LH}