

XP to Investigate Effect of Lithium-Coated Divertor on Plasma Performance with LITER-1d

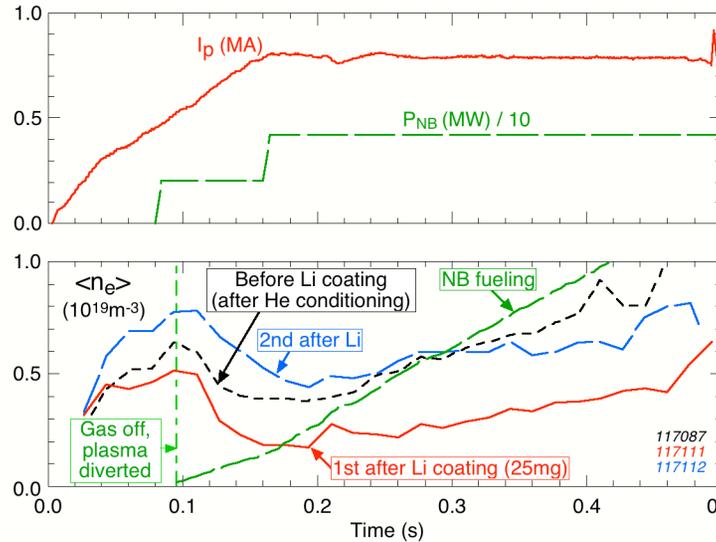


- The initial LITER-1c results suggest the following FY07 experimental investigations:
 1. Does persistence of lithium effect on plasma depend on deposition thickness?
 - Test capability for more deposition [$\approx x67$ - $x96$] on lower divertor target region (larger output barrel [$x1.65$] and re-aim [$x2.72$] at outer strike-point and higher temperature operation [$@730^{\circ}\text{C}/600^{\circ}\text{C} \sim x15$, $@750^{\circ}\text{C}/600^{\circ}\text{C} \sim 21.5$])
 2. Does passivation and intercalation after deposition affect effectiveness of lithium?
 - Test with faster between-shot evaporation (~ 5 - 10 min)
 - Test with shorter duration (~ 30 - 180 sec) between end of evaporation and subsequent discharge
 3. What is effect of lithium coatings on density profiles with increasing density?
 4. Can decreasing the recycling per unit area by increasing the plasma wetted area through flux expansion ($x2$ - 20) by lowering the X-pt increase the effectiveness and duration of density control?

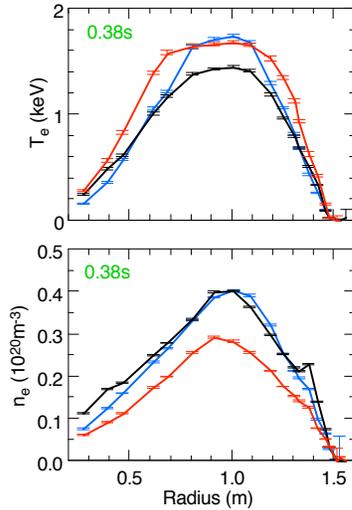
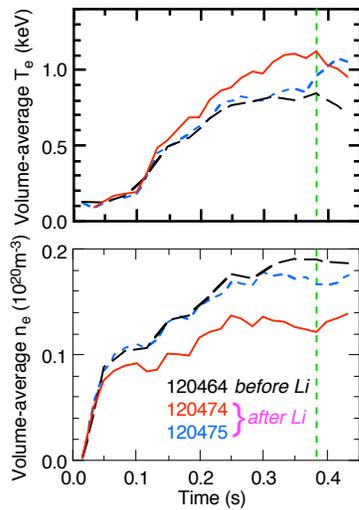
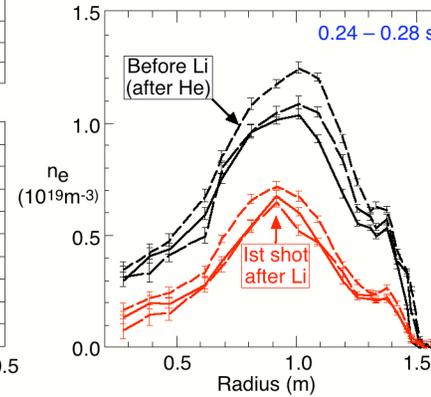
LPI at Low Density and LITER at Higher Density



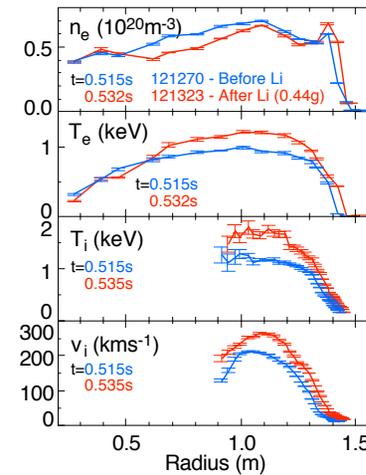
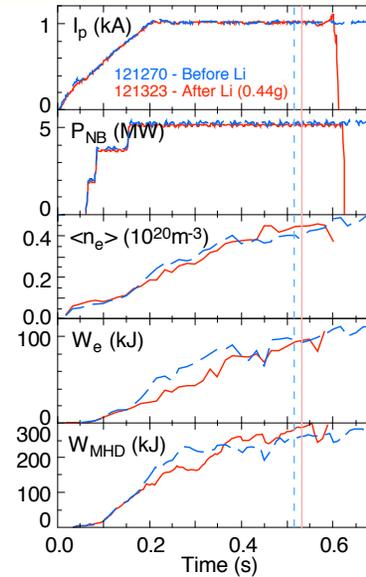
LPI LSN L-mode



Lower single-null divertor discharges, 0.45T, D₂ gas fueled 3.5mg



LITER-1c LSN L-mode



LITER-1c LSN H-mode

Shot List for XP to Investigate Effect of Lithium-Coated Divertor on Plasma Performance with LITER-1d



1. Measure greater deposition on lower divertor target region
 1. Before Li evap, Run D LSN H-mode shot 121323-LD (if possible, try Lower Density $\sim 1 \times 10^{19} \text{ m}^{-3}$) [1 shots]
 2. 10 min HeGDC and then deposit 0.25 gm (@0.05 g/min) and Run shot 121323 within 2 mins [3 shots]
 3. If effect, repeat with 0.125 gm [1 shot]
 4. If no effect repeat with 0.5 gm [1 shot]

2. Choose best condition, and then measure faster between-shot evaporation for shorter intercalation/passivation time,
 1. Deposit at faster rate (@0.11 g/min) and Run shot 121323-LD within 30-60 sec [3 shots]

3. Choose best from the above, and repeat at increasingly higher densities
 1. Repeat with x2 density [1shot]
 2. Choose best condition and then measure the effects of increasing the density x2 [3 shots]

4. Choose best from the above and repeat using increasingly lower X-pt to increase the flux expansion (x2-20) & reduce the recycling per unit area [8 shots]