

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 XP's be formulated to use lithium evaporation for improved performance as observed during 2006 run (e. g., better density control during long pulse H-modes, achievement of reversed shear discharges, etc.)

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 [1 shot]
 2. Deposit 0.5 gm (@0.05 g/min for 10 min) and Run shot 121323 within 2 mins [1 shot]
 3. Repeat 121323 two more times [2 shots]

2. Measure faster between-shot evaporation shorter graphite intercalation time,
 1. Deposit 1 gm (@0.11 g/min for 10 min) and Run shot 121323 within 2 mins [1 shot]
 2. Repeat 121323 two more times [2 shots]

3. Measure effects of impurity passivation between D LSN ohmic discharges.
 1. Close NBI TIV and TMPs. Run 121323-Ohmic. Measure change in gas pressure. [1 shot]
 2. Relithiumize, Wait 1 min. Run 121323-Ohmic. Measure change in gas pressure. [1 shot]
 3. Relithiumize, Wait 10 min. Run 121323-Ohmic. Measure change in gas pressure. [1 shot]

4. Measure the effects of increasing the density x2
 1. Repeat best of above at higher density [2 shots]

5. Support other XP's exhibiting improved 2006 performance after lithium
e.g. long pulse H-modes, reverse shear discharges,...