Characterization of the Boundary Layer and Power Flow to the Divertor

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Experimental Run Plan (2 days)

- Conditioning:
  - Perform 30 minutes of He GDC.
- NBI Power Scan:
  - Establish discharges with $I_p \sim 800$ kA with a 200-300 msec flat top, $B_t = 4.5$ kG, $\langle n_e \rangle = 2.5 \times 10^{13}$ cm^{-3}
  - Inject NBI into plasma with above conditions varying injected power from 0.5 to 6 MW in 0.5 MW steps:
    - 1 @50% modulation
    - 1 source
    - 1 +1 @50% modulation
    - 2 sources
    - 2 +1 @50% modulation
    - 3 sources

Configuration scan

- DND Configuration scan: (6 shots)
  - Use DND configuration with same operating conditions, injecting with one NBI source.
  - Repeat this configuration, but with two NBI sources.
- CSL comparison
  - In CSL configuration and inject with one NBI source into L-mode plasma.

Density scan

- Revert to LSN configuration and inject with two NBI sources.

- Repeat this configuration, but change profile integrated electron density to $\langle n_e L \rangle = 2 \times 10^{15}$ cm^{-2}, 4×10^{15} cm^{-2}, and 5×10^{12} cm^{-3}, taking 2 shots at each condition. Examine for signs of plasma detachment and changes in density profile.

Supplemental Scans

- I_p scan for comparison with 800 kA baseline
  - Scan I_p @ 600 kA and 1 MA
    conditions as in power scan
- Toroidal field scan for compari
  - Scan B_T at 3, and 3.5 and 4
    sources, with same condition
    at B_T = 5 kG if NSTX if perm