Aspect ratio studies utilizing DIII-D and NSTX

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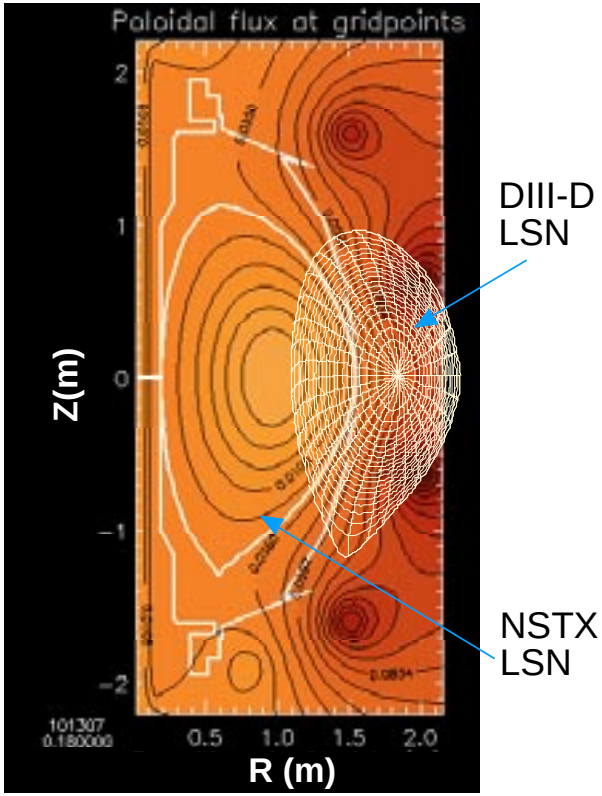
DIII-D and NSTX are well suited to explore the physics of high beta and aspect ratio

- Similar cross-sectional areas and shapes, but very different aspect ratio

- Can be run at similar engineering parameters (B_T = 0.6 T, Ip can be matched)

- Both co-injection, 7 MW
  HHFWalso available

- Beta can be matched and scanned



Paoletti, Sabbagh (Columbia)

NSTX is ready to move to global and local comparison studies with DIII-D

Questions from DIII-D about our readiness:

Q: Can you run at 5.5 - 6 kG A. Yes

Q: Do you have the profile data? A. Yes, $T_i(R,t)$, $V_\phi(R,t)$ $T_e(r,t)$ now

Q: Do you have a database to compare to?

A. Yes

Perform both dimensional and dimensionless comparisions

- Dimensional: compare τ_E at constant n_e, temperature,toroidal field, power, I_p
- Dimensionless: compare local heat fluxes at constant q, ν^*, β_T, $\langle\rho^*\rangle$
- Both with co-injected NBI
- Heidbrink's work provides a basis for this

First, generate an ensemble of comparison plasmas on NSTX

- 6 kG (both devices)
- Ip: ~ 700 kA (both devices) allow adequate fast ion confinement
- ne scan
- NBI power variation to vary beta
  - If FW available on DIII-D, use this, too
- Inner-wall limited L mode; LSN H mode
- Can also raise Ip on NSTX to match the edge q on DIII-D

A subset will be matched and documented on DIII-D

- NSTX and DIII-D have a unique opportunity in the U.S. community to use their programs to get at powerful physics