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Scrape-off Layer Particle and Energy Transport with varying SOL Collisionality

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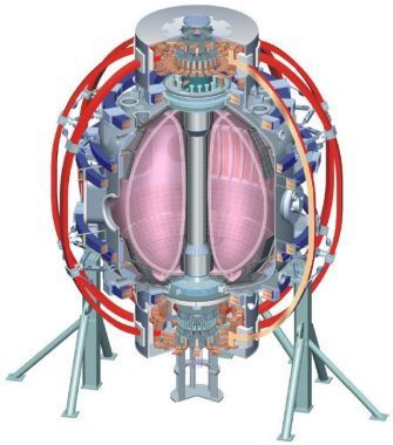
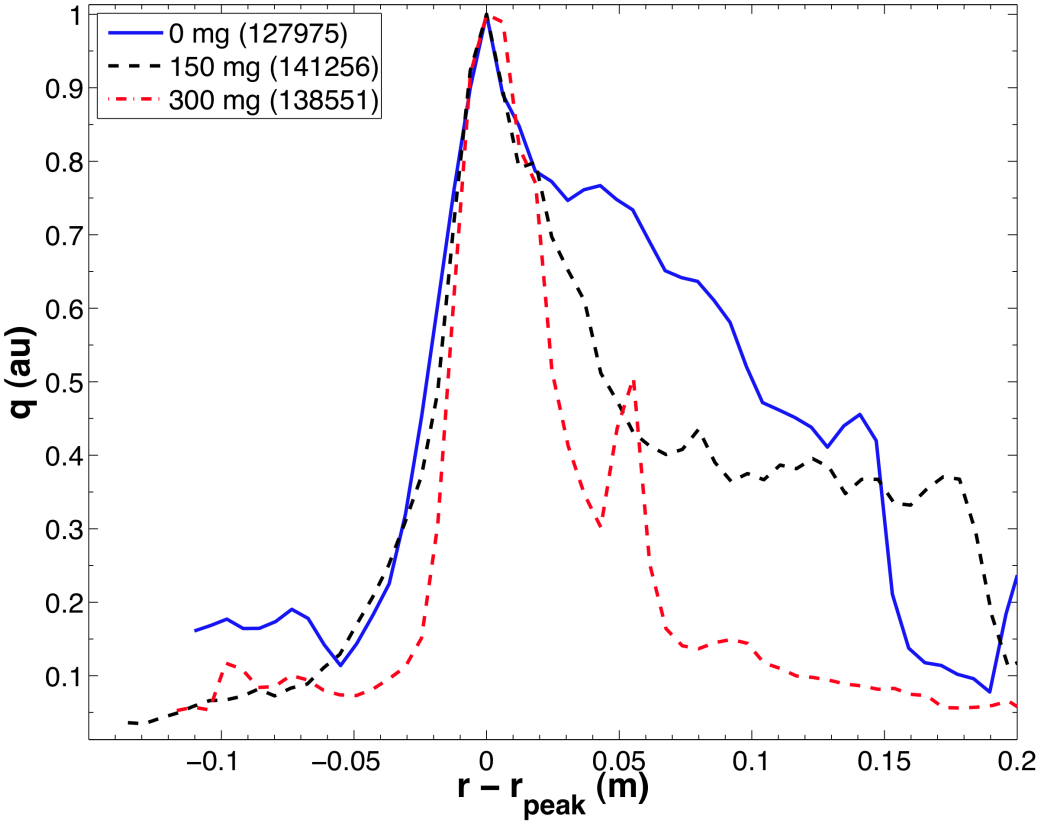


Motivation: Lithium has been shown to cause a contraction in SOL width

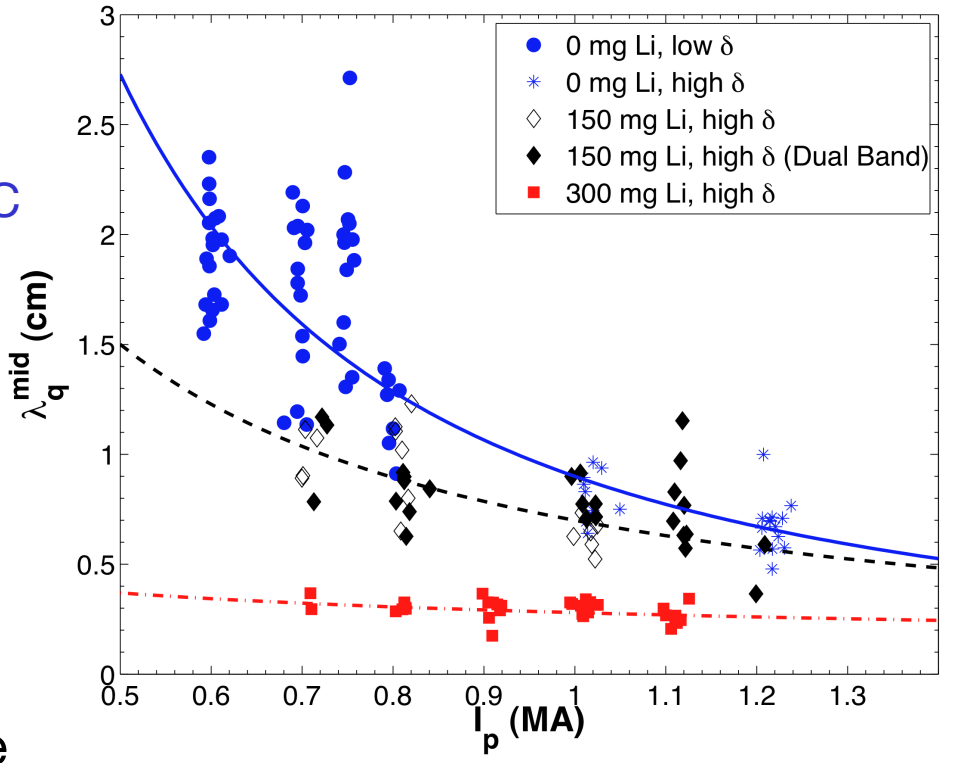
- Recommendation from the PAC to better understand SOL width contraction
- Type V ELMs eliminated from lithiated discharges
  - Some sporadic type I ELMs are still present
  - Responsible for some of the contraction in IR profiles
- λ_q^{div} contracts further with increasing lithium deposition



	0 mg	150 mg	300 mg
λ_q^{div} (cm)	14.1	13	7
λ_q^{mid} (cm)	0.98	0.74	0.37

Measure the SOL width from IR, optical and particle profiles simultaneously

- Will inform on physics leading to contraction of λ_q
  - Recommended for study by the PAC
  - Impacts NSTX-U operation
- Determine whether particle flux profiles also contract similar to λ_q
- Probes will help better determine divertor operating regime
  - Conduction, sheath limited or detached
- Provide insight into edge turbulence and the role it plays in setting λ_q
- D_α measurements qualitatively show a similar trend with IR measurements
  - Quantitative measurements require knowledge of n_e and T_e



- Interest from modeling community on this XP
  - OEDGE: M. Jaworski (PPPL)
  - SOLT: J. Myra (Lodestar)

Proposed Run Plan: 1 day (0.5 day minimum)

- Run a medium δ shape with OSP on or near the high density Langmuir Probe array
  - Optimize OSP location to provide the best divertor profiles of n_e and T_e
- Scan I_p and SOL collisionality at 2-3 Lithium deposition rates
  - Collisionality will be scanned with changes in I_p ($L_{||}$) as well as the addition of midplane gas puffing
  - I_p = 0.8, 1.0, and 1.2 MA (if possible)
  - Li depostion rates = 100, 200 and 300 mg
  - Exact number of points in I_p and Li scans dependent on run time allocation