

XP951 Improved lithium coverage with diffusive Li injection

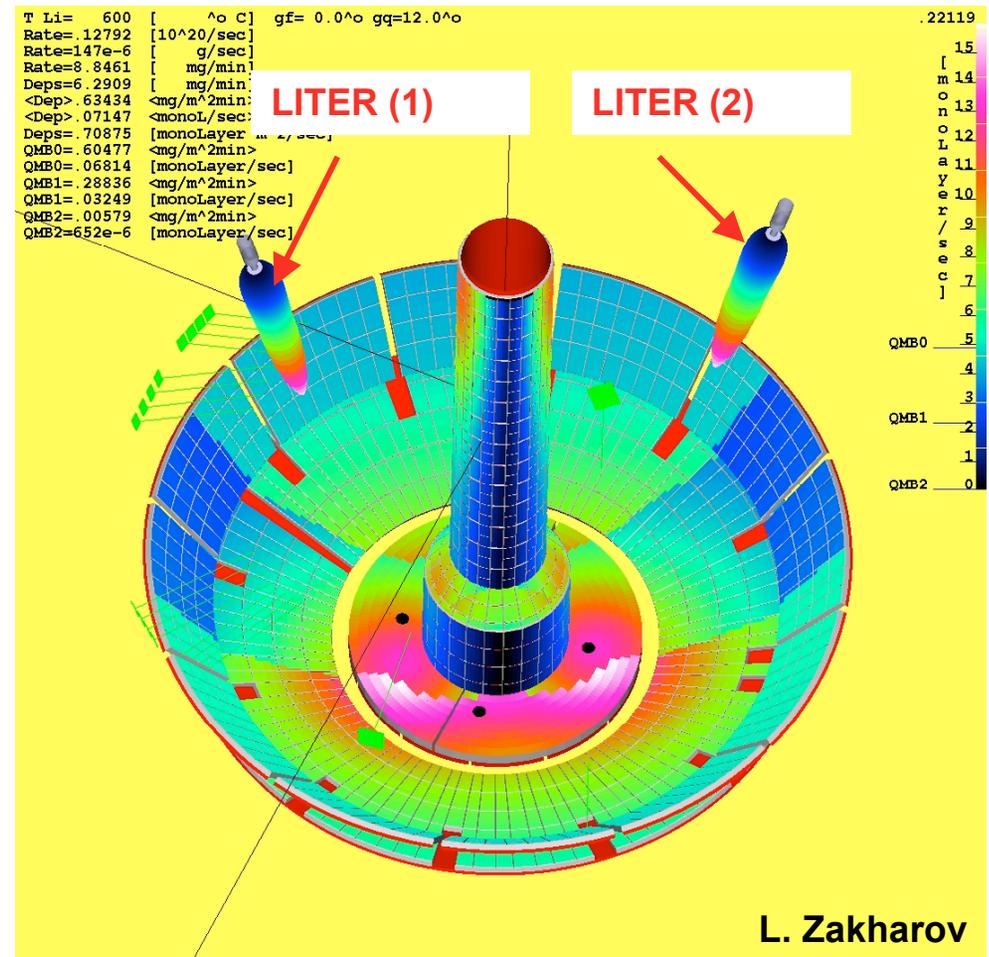
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Motivation:

- Density and impurity control is goal of multi-year Li program on NSTX.
- But so far elimination of ELMs by Li has caused impurity accumulation late in discharge.
- Core carbon levels actually increase with Li. (R. Bell).

XP951 Plan:

- Inject Li into low pressure He gas.
- Collisions will scatter Li into previously shadowed areas on center stack and upper midplane.
- Vary coverage by varying He pressure and mean free path (e.g. mfp = 17 cm @ 4e-4 torr He).
- Monitor upper QMB, Prad, Zeff...



Preliminary results

- Started with good LSN H-mode fiducial with 200 mg 'regular' Li evaporation into vacuum.
- Varied He pressure in 3 stages during 200 mg LiTER evaporation
 - $1.2e-4 \pm$ factor two (mfp= 0.56 m)
 - $4e-4$ torr He \pm factor two (mfp= 0.17 m, *best*)
- Double LiTER to 400 mg into
 - constant $25 e-4$ torr He (mfp= 0.03 m)
 - constant $10 e-4$ torr He (mfp= 0.07 m)
 - constant $4e-4$ torr He (mfp= 0.17 m)
- Results showed more pumping (more gas needed) and up to ~20% lower Prad, lower Zeff (VB), Zeff (CHERS), Zeff (metals).
- See expected deposition on upper QMB.
- No large increase in He emission on SPRED.
- Notice 'enhanced' green emission on upper CS.
- Exception is first shot at $1.2e-4$ torr He.
- Relevant 'integration time' for Li unclear.
- DEGAS modeling pending.

