

IAEA 2012 Talk Outline: “The nearly continuous improvement of discharge characteristics and edge stability with increasing lithium coatings in NSTX”

- Focus is on the ‘continuous’ effect, i.e. that the fractional change in edge recycling, confinement, transport, and ELM stability depends on the amount of pre-discharge lithium deposition
 - D_α , P_0^{mid} , and ELM frequency go down with increasing lithium
 - Profile peaking factors go down and H-factor goes up with increasing lithium
- Transport
 - χ_e goes down from \sim mid-radius to edge (TRANSP), but not in core
 - χ_e goes down from $\psi_N \sim 0.8-0.97$ (SOLPS), but goes up slightly outside
 - (J. Canik paper) From $\psi_N \sim 0.9-0.95$, μ tearing reduced due to enhanced n_e gradient (in this region, reduced collisionality is destabilizing)
- Stability
 - Gradual change in ELM stability is generally reflected in ELITE calculations, including ELM-free to ELMy to ELM-free sequences due to long L-modes
 - Profile change from $\psi_N \geq 0.95$ is stabilizing due to reduced P'
 - Profile change from $\psi_N \leq 0.95$ (increased P') is also stabilizing – kink/peeling boundary improves