Circumstantial evidence points to Edge/SOL flow and flow shear as underlying the x-point dependence of L-H power threshold.

MP493 attempted to highlight differences in edge flow/flow-shear in LSN and USN as ohmic L-H transitions were approached.

The goal was to study these differences, primarily with Mach probes.

But, contrary to expectations, the power threshold was identical in LSN and USN! ⇒ The topology ‘tool’ failed.

(Flow and flow shear was virtually identical on the Mach probes… inconclusive.)
Yet, we know that ICRF-heated discharges exhibit clear changes in edge/SOL flows as L-H transition is approached.

⇒ We should revisit ICRF heating as a tool to study edge flow and flow shear evolution to L-H with Mach probes.

Two diagnostic improvements have recently occurred, which may allow further exploration of ICRF-heated discharges with probes:

• High heat-flux, tungsten-tipped Mach probes
• Ability to monitor \( \perp \) flow and flow shear

Sheath-rectification does not corrupt \( I_{sat} \) measurement, the basis for flow interpretation.

We may also be able to implement an ICRF filter using a stub-tuned coaxial cable network\(^1\)

Edge Flow and Flow Shear Evolution to the L-H Transition
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Setup:
• ASP, FSP and WASP \perp Mach probes, scanning to LCFS
• Implement 80 MHz ICRF filter on ASP drive, if possible
• All available CXRS diagnostics plus X-ray doppler
• GPI-inferred poloidal phase velocity profiles across edge/SOL

Experiment (~1 run):
• Revisit 0.8 MA L-H threshold shots, NL04 ~ 0.9e20, LSN
  - well-conditioned plasmas (boronize, if necessary)
  - step ICRF power shot to shot, up to L-H transition
  - optimize flow diagnostics
  - carefully target probes to capture shear layer near LCFS
• Repeat with USN and higher ICRF powers
• Map out flows, shear layer and gradient evolution (if any) near LCFS