3. Inner-Wall Scanning Probe (ISP)

- Measuring a localized "magnetic probe"
- Grid of 500x500 single Langmuir electrodes
- 100 probes in tandem (mirror the ISP geometry)

- In addition, field plots from along-field from the midplane showed double-null discharges with high beta (1.3-1.5 T5, 13, 27 ME) and both single null discharges in the midplane with non-identical discharge and fusion performance

- In the midplane, the ISP data shows the presence of strong parallel plasma flows

- The flows consist of strong parallel flows in the midplane and weak parallel flows towards the upper divertor chamber

4. Outer-Midplane Scanning Probe

- Operates as a "Bear probe"
- "Bear" detects flows opposite to field line from "Bear" detects flows "aligned"
- In addition, along-field/parallel density over range of discharges studied:

5. Effect of Magnetic Topology

A. Lower Single-Null
- Inner/outer midplane profiles:
  - High inner and low outer
- Mach #:
  - Very strong inner flow to lower α-p on inner

B. Upper Single-Null
- Similar to A, but with Ne puffing on inner
- Mach #:
  - Very strong inner flow to lower α-p on outer

C. Double-Null
- Similar to A, but with Ne puffing on outer
- Mach #:
  - Very strong inner flow to lower α-p on outer

6. Effect of Plasma Density

- Over range of discharges studied:
  - Very strong inner nT profile in double-null
  - Strong inner Mach # flows are seen, direction depends only on α-p balance

7. Summary => Implications
- Very strong inner nT profiles in double-null, with direction dependent on α-p balance
- Strong inner flows towards upper x-p.


- Ballooning-like transport is found in discharges which have a lower single-null (Bx/Ip down) or lower single-null discharges resulting in high H-mode access

References:

8) Smaller Jsat ratio. => Smaller momentum-drive retards natural averaged toroidal momentum in SOL

9) Larger Zr in E/Ip near separatrix => larger E/Ip near separatrix

- Invoking ErxB shear turbulence-suppression paradigm: => H-mode power threshold reduced in lower single-null!