

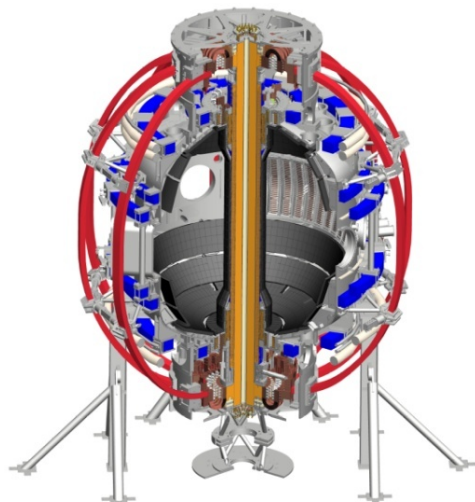
Halo Current Studies in NSTX-U

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MS TSG Breakout Session
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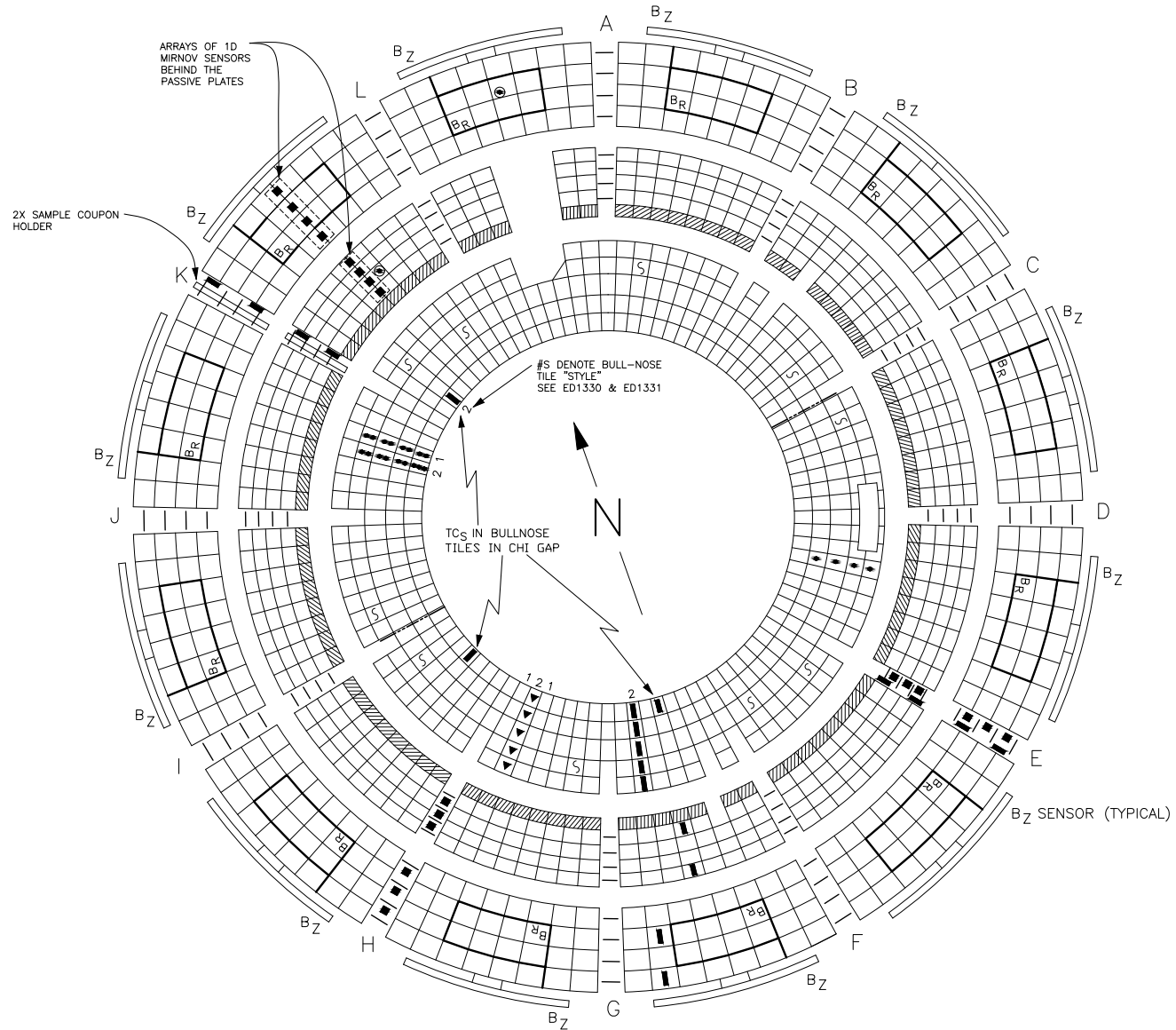


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Halo Current Diagnostics

- Sensors Installed:
 - 10 shunt tiles in the outboard divertor

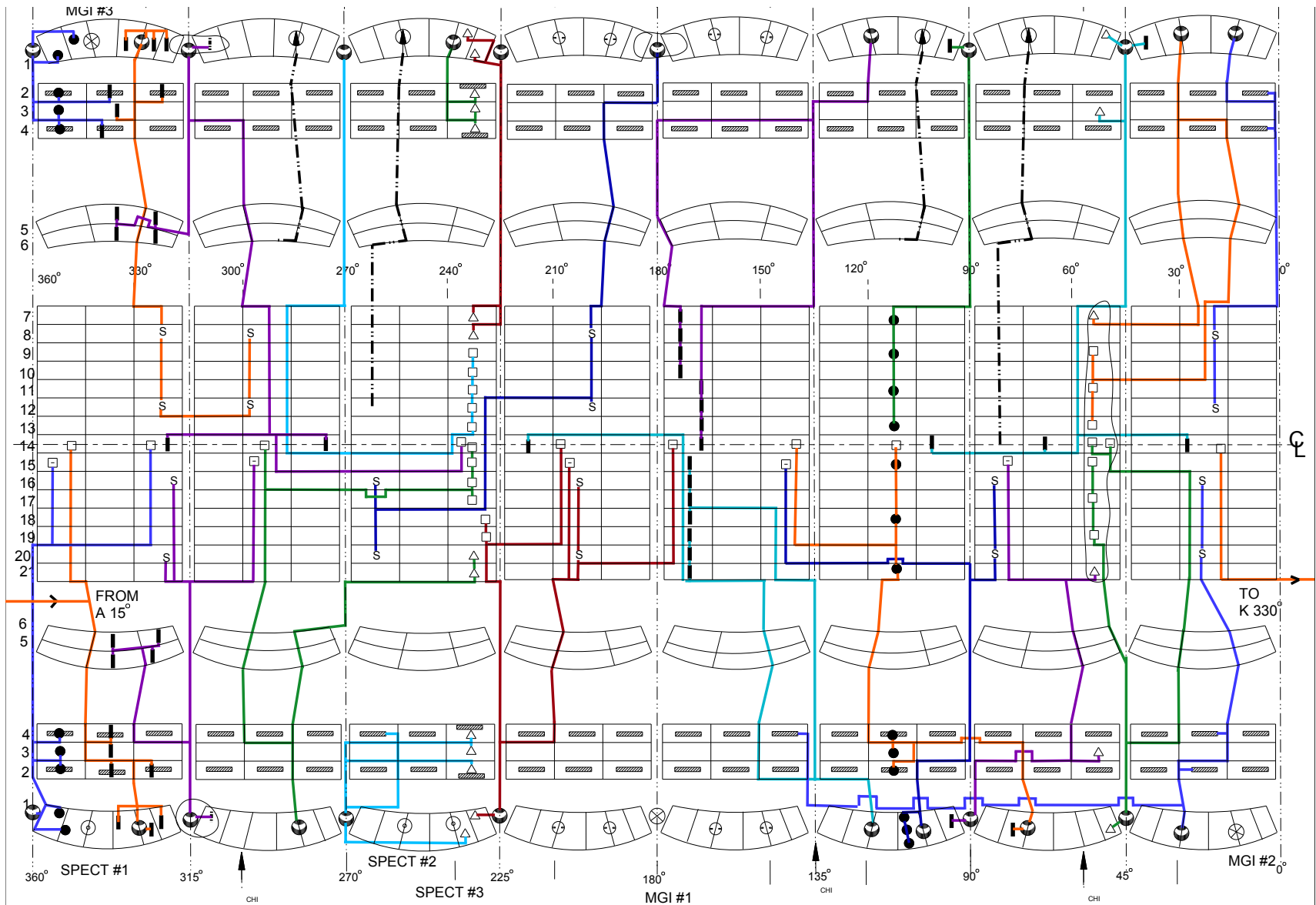
Lower Divertor Tiles-S



Halo Current Diagnostics

- Sensors Installed:
 - 10 shunt tiles in the outboard divertor
 - 18 shunt tiles on the center column.
 - 5 “tilted Mirnovs” on the CS at the midplane.

CS Shunt Tiles - S



Halo Currents

- Sensors Installed:
 - 10 shunt tiles in the outboard divertor
 - 12 shunt tiles on the center column.
 - 5 “tilted Mirnovs” on the CS at the midplane.
- Sensors on CS motivated by question of non-axisymmetric halo currents on the CS.
 - JxB forces obviously have potential to be highest on the CS.
 - Non-axisymmetric halo currents can lead to large sideways forces.
 - Note: NSTX-U has some shims installed at the top of the vessel to attempt to prevent bending of the CS.
- Cross-TSG connection to ASC:
 - Should be able to correlate reduced halo currents when Stefan’s automated shutdown “dud detector” kicks in

This XP

- Piggyback data from VDE experiments and normal operation
 - Routine halo current data will be collected and analyzed
 - First measurements of center stack halo currents in an ST
 - Quantify the impact of various disruption avoidance and mitigation techniques
- Theory collaboration with Amitava:
 - Dedicated postdoc, VALEN (Bialek), M3D-C1 (Jardin), etc.
 - Compute halo current forces in detail
 - Inform future halo current diagnostics
- Support ITPA disruption and halo current MDC's and JRT16