Follow-up on TAXS-TAXN

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TAN vs TAXN approach

**TAN**
- Uncooled
- Cu absorber surrounded by steel box, inside TAN shielding
- Baking at periphery of steel box
- Thermal insulation: aluminium sheet

**TAXN**
- Water cooled
- Cu absorber surrounded by thermal insulation
- Baking & cooling in absorber
TAXN baseline design

- Shielding re-used from the present TAN (not marble).

* Luminosity detector
TAN VS TAXN ABSORBERS

TAN

TAXN (Baseline)

Cross Section

Cross Section

Side View (TAN absorber length)

Side View (TAXN absorber length highlighted)
Current status based in optics v1.3

- Y-chamber designed
- Absorber designed
- External shielding to be re-used
- Collaboration agreement being discussed: manufacturing in BINP
- Integration of BRAN pending
- No forward experiments (yet)

- On hold, new optics (1.5)
2019 TAXN timeline

- June 2019: beam optics review → impact on the Y-chamber.
  → Mechanical aperture update.
  → Mechanical tolerance review.
  → Alignment tolerance definition.
  → BRAN design.

- December 2019: final design from WP8.
Recombination chamber

- Design finished (optics v1.3).
  - Technical specifications document done (EDMS 1824656 v3).
  - Material: cooper.
  - NEG coated.
  - Validated by beam impedance working group
    - Impedance Working Group meeting #17.
  - Length equals to 4902mm.

- Aperture to be updated in June 2019.
  - Based on WP2 & WP10 inputs.

- Mechanical tolerances definition to be reviewed after beam aperture review.
TAXS baseline design

- Cu absorber inside existing forward shieldings
- Unbaked, water cooled
TAXS

- Integration models based in the current TAS, where:
  - CMS @ nominal position
  - ATLAS Non Conformity, EDMS 1137878:
    - Point 1 TAS side A (left) is installed 29 mm further than the nominal position, away from the Point 1 IP.
    - Point 1 TAS side C (right) is installed 21 mm further than the nominal position, away from the Point 1 IP.

- TAXS IP face position could be at nominal (TAXS face @19050 from IP), tbd before Q3.
- HL-LHC ECR + Update of Functional specification will follow.
TAS in ATLAS forward shielding

Position: ATLAS Non Conformity, EDMS 1137878
**HL-LHC VAX design**

**VAX area cross section**

- Cold vacuum (until end of D1)
- Vacuum @RT
- NEG coating (until TAXS)

**Apertures to absorb relative re-positioning/movement without further re-alignment**

**Bellows to compensate +/- 10 mm transversal**

- TAS to be replaced by TAXS to increase aperture of the beam (ID34mm to 60mm)

**Smooth ID aperture transitions: same solution for ATLAS and CMS**

**New radiation hard ID 80 mm sector valve under development**
Conclusions

- Y-chamber design to be updated after beam optics iteration. (chamber aperture and tolerances)
- TAXN adapted to Y-chamber & WP10 requests, BRAN to be studied in detail.
- TAXS IP flange @ IP1 under study.
- VAX approach: large apertures to reduce impedance.
Present TAN – 5L (UJ53)
Present TAN – 5R (R571)