

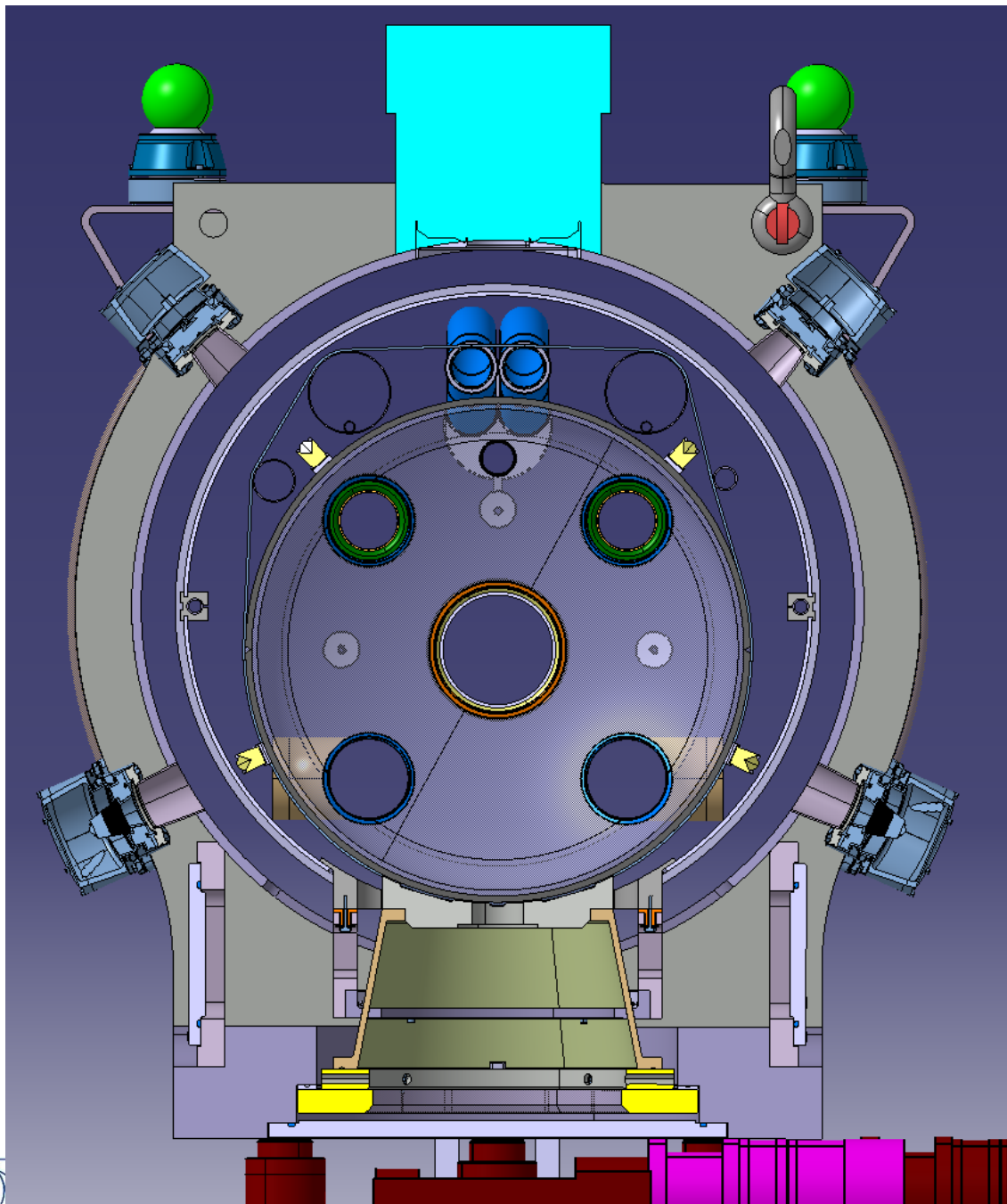


# Status of pumping pressure drop issue in the Q1-D1 continuous cryostat

D. Ramos, M. Moretti, C. Eymin



WP3 meeting 17 January 2018



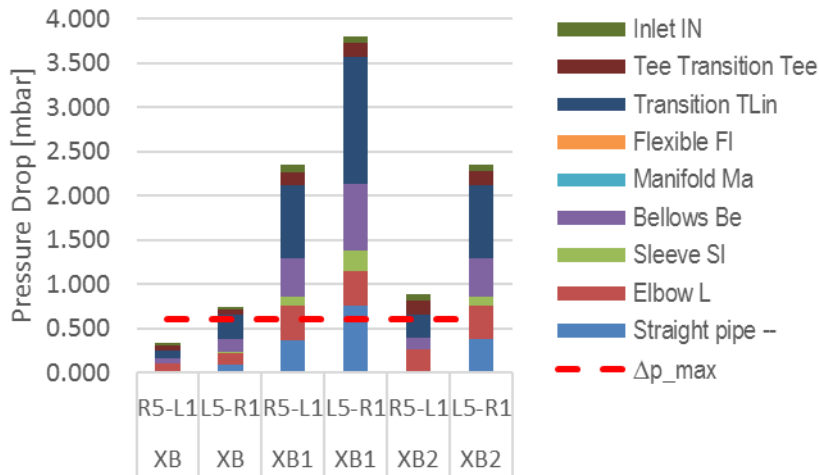
# History

- High pressure drops identified in pumping lines: 3rd WP3+11 Cryostat interface Meeting <https://indico.cern.ch/event/677105/>
- Refined calculations and new assessment of pressure drops: 4th WP3+11 Cryostat interface Meeting <https://indico.cern.ch/event/687145/> + integration study of jumper between Q2a and Q2b
- This meeting: Present status and decisions to be taken

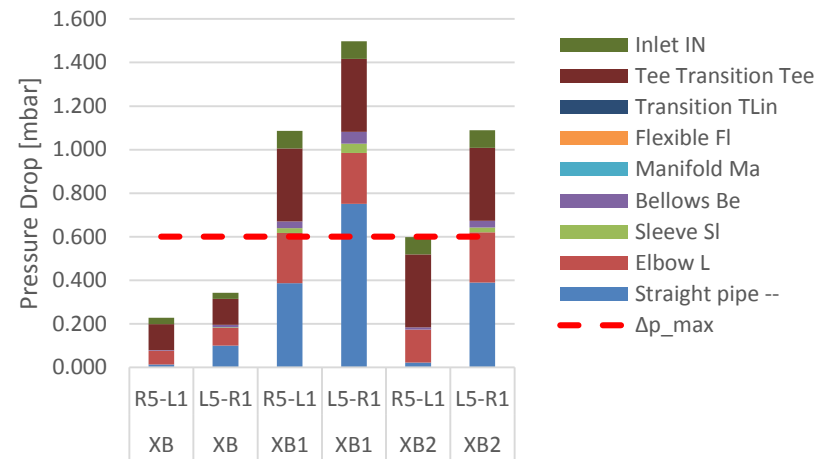


# Pumping pressure drop assessment (lines XB)

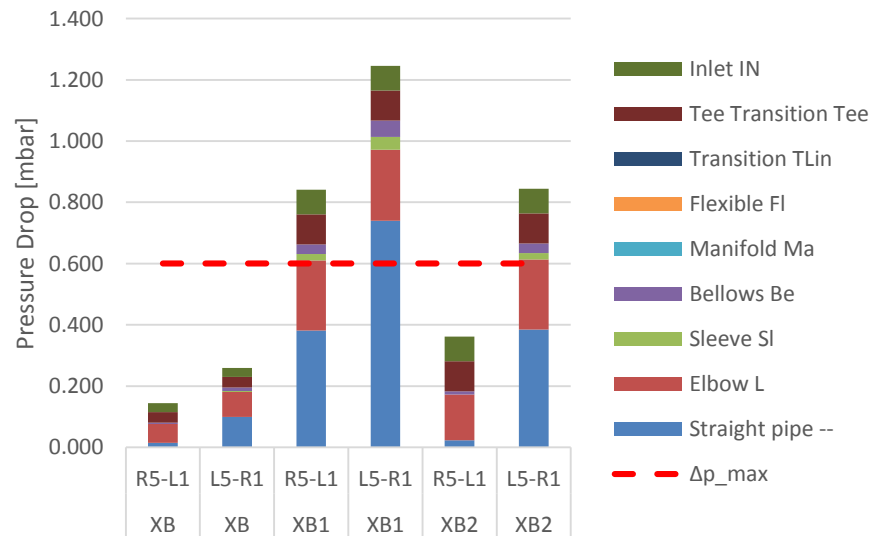
First detailed assessment



Second detailed assessment with updated bellows designs



Present detailed assessment with T-transitions replaced by Y-transitions

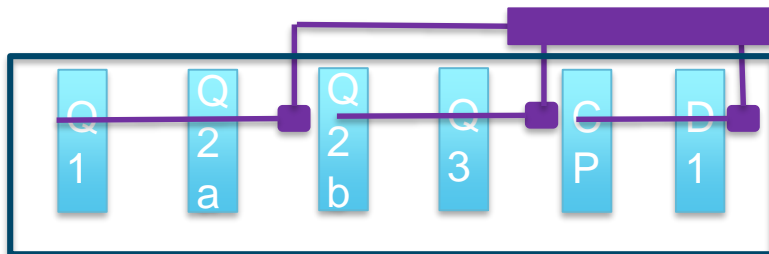
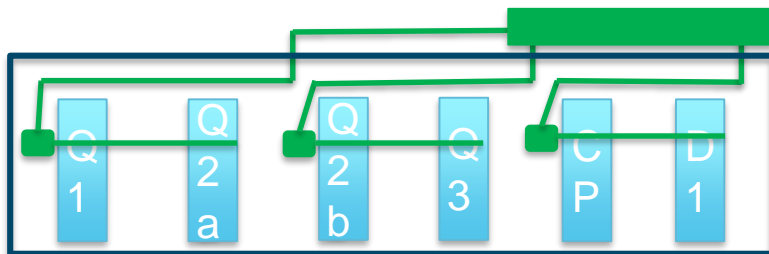


Note: All calculations for ultimate operating conditions

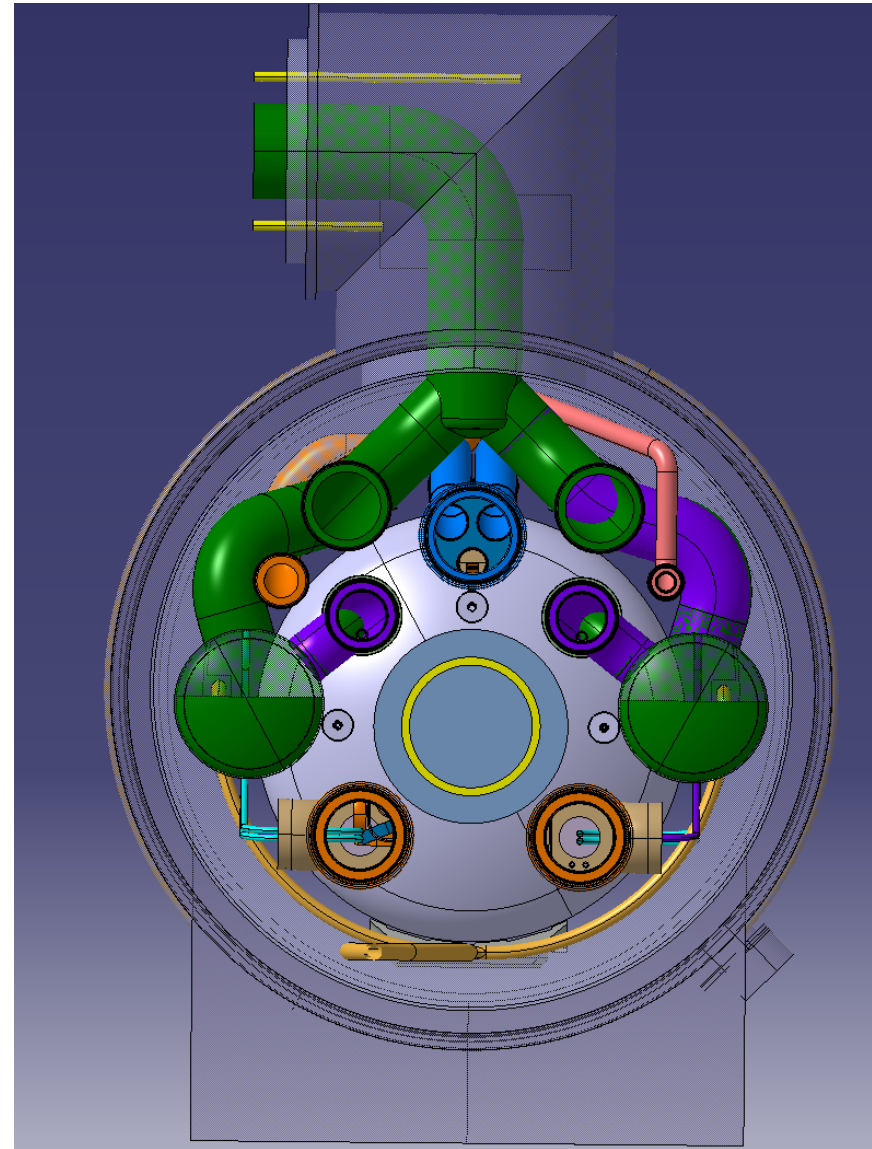
# Jumper between Q2a and Q2b – integration study

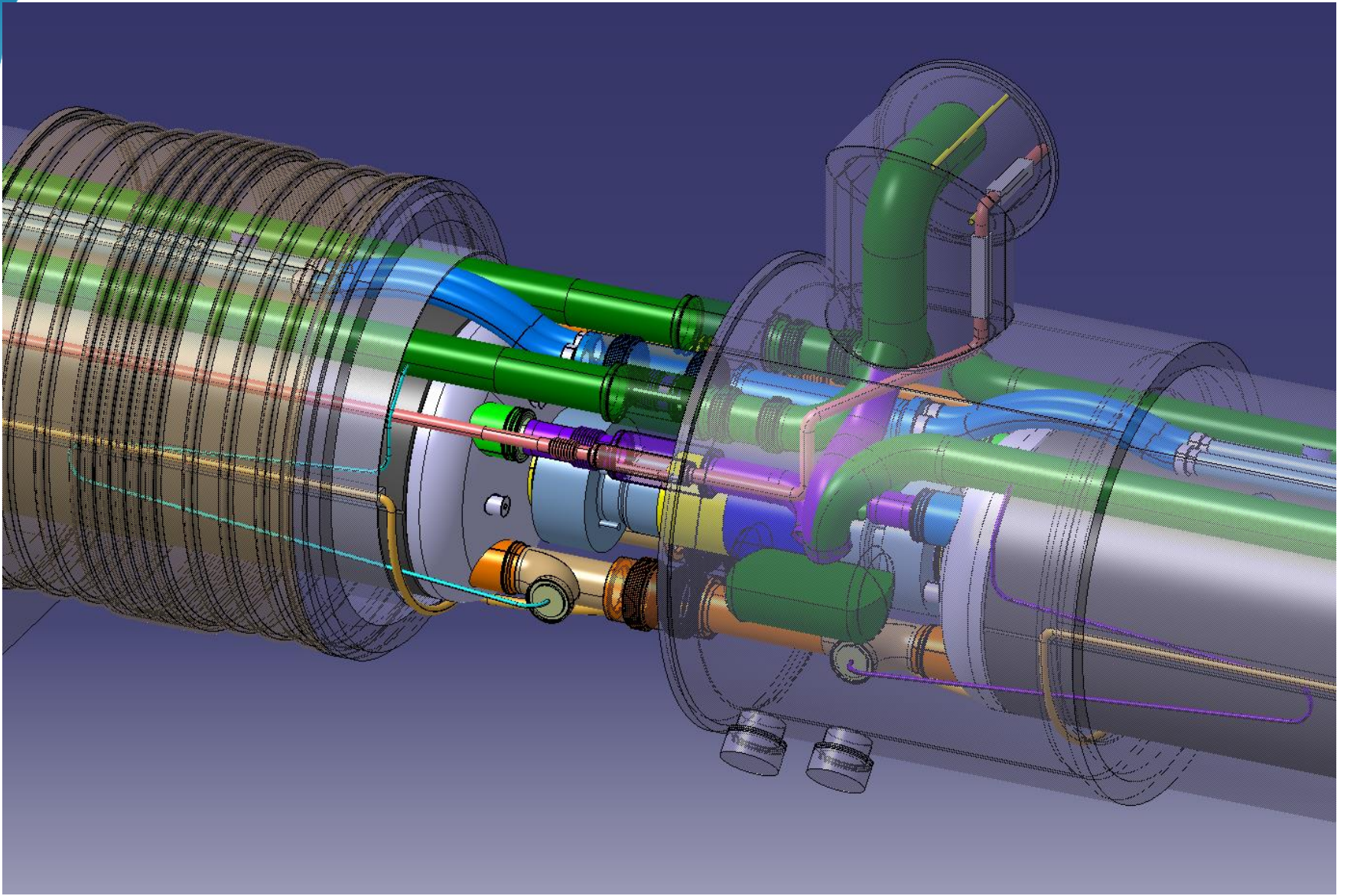
Smarteam ST0913169

- Double cross section
- External cryo-line between jumper and QXL service module (remaining at the corrector package level) with actively cooled thermal shield

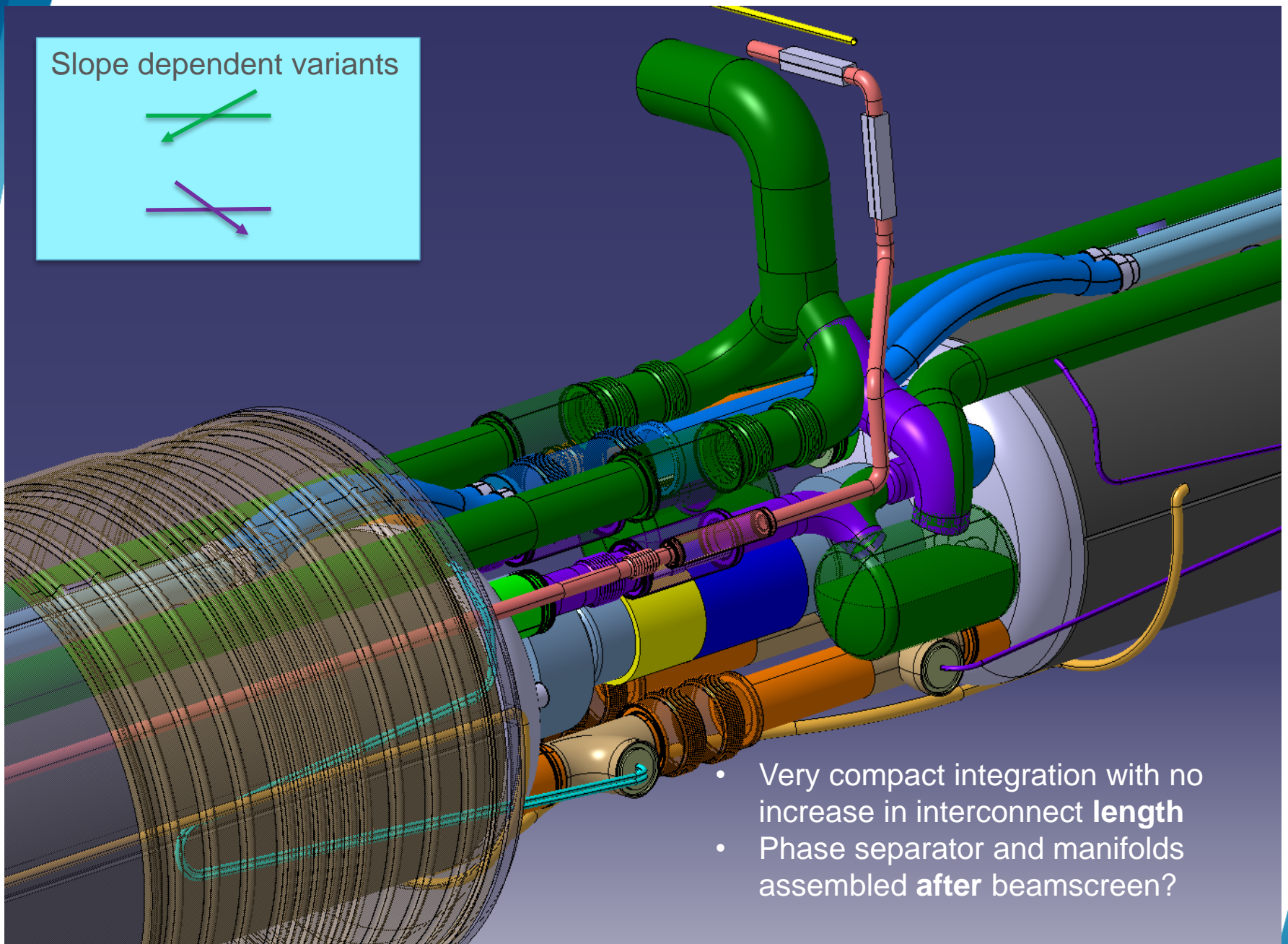


Slope dependent variants





## Slope dependent variants



- Very compact integration with no increase in interconnect **length**
- Phase separator and manifolds assembled **after** beamscreen?



# Point of situation

- Without design changes the pressure drop in XB line is calculated at **1.2 mbar at ultimate**, i.e. 2x the specification. To be discussed if it could be accepted.
- We **discarded an oval cryostat** to accommodate larger piping diameters
- An additional **jumper between Q2a and Q2b** will drastically lower the pressure drop and pumping will be guaranteed to not limit machine performance. The QXL service module remains at the level of CP – simple transfer line up to Q2b. However:
  - Management of thermal contractions in Q2 will be more difficult: either the jumper is designed for ~15 mm movement or one of the sliding posts will have its stroke doubled.
- A decision must be taken urgently in order to finalise the drawings for the vacuum vessels of Q1 and Q2 protos and launch procurement