

*DS-20k Calibration Meeting, 03 Jun 2021*

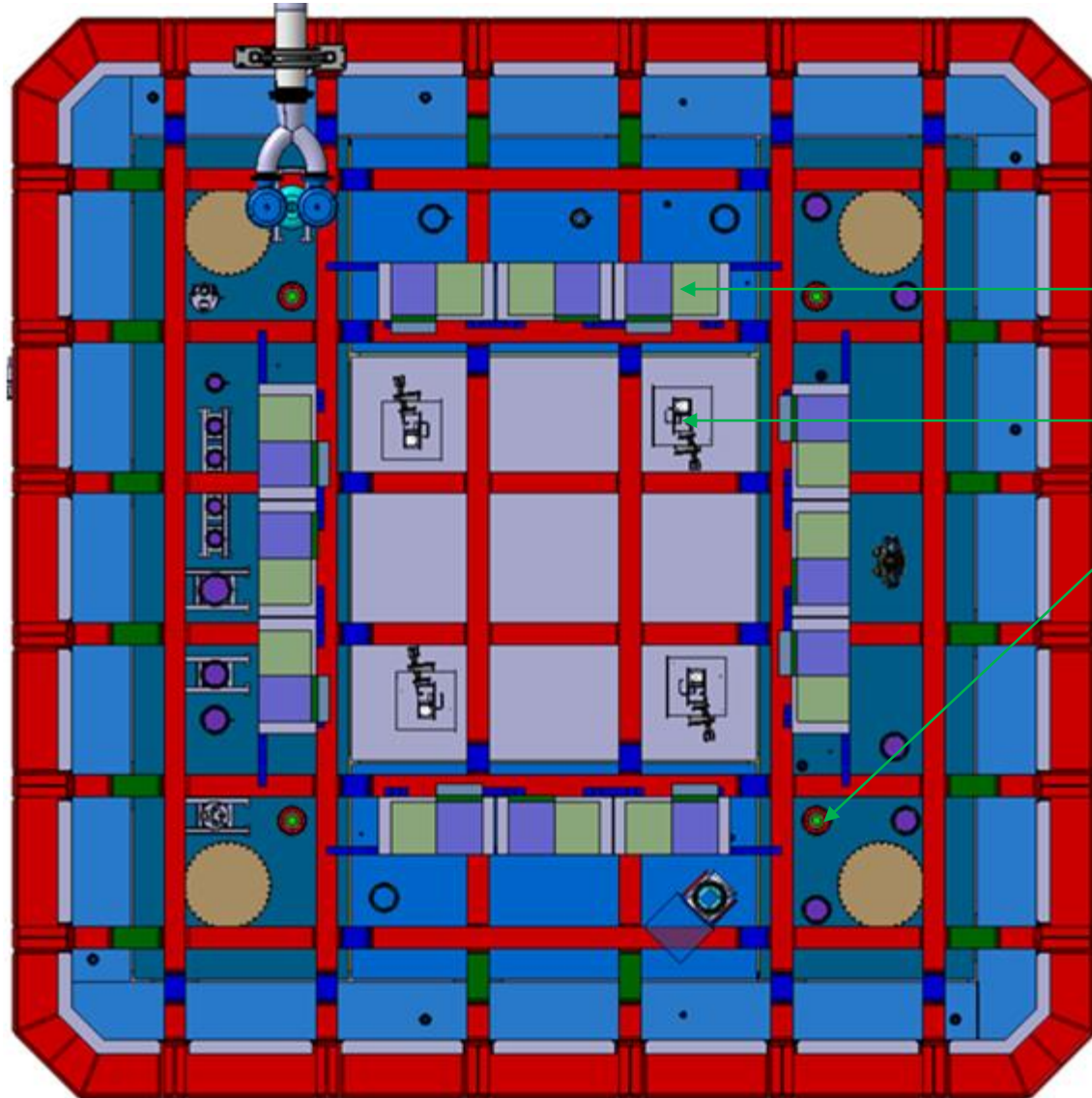
# Calibration system preliminary CAD integration in Option C

*Marco Carlini*

**darkside**  
two-phase argon TPC for Dark Matter Direct Detection



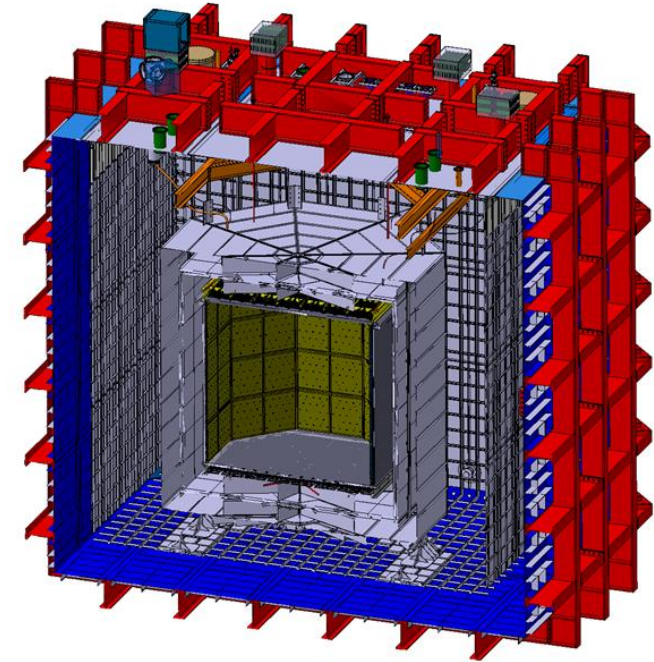
# A bit of history: Option A



12 x signal chimneys

4 x calibration

4 x DSS penetrations



In this configuration calib penetrations were on the 45 deg plane and DSS on the outside roof modules.

New design of DSS (see next slide) has important advantages:

- is simplifying detector installation and leveling operations;
- is much less massive.

# Opt C: pipe routing and calib penetration

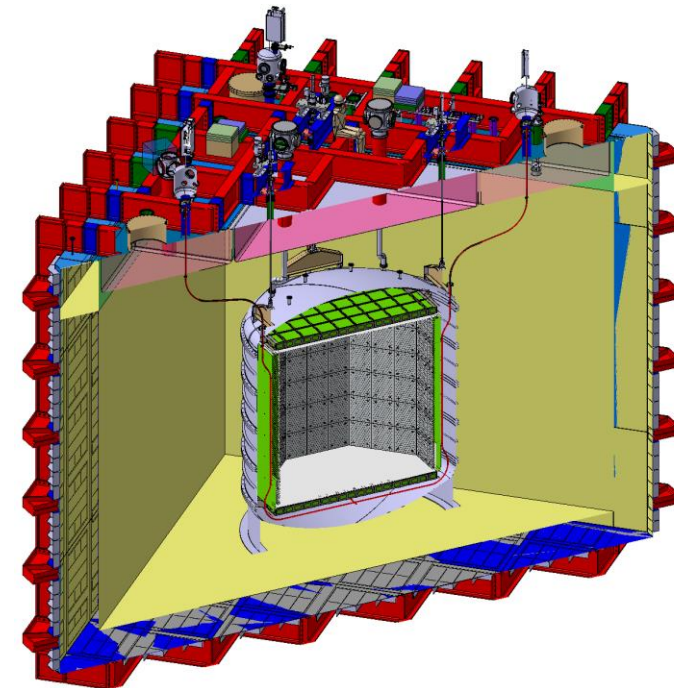
Important remarks:

1. **Penetrations location is not fixed:** the relative placement can be optimized.
2. The only "fixed" position assignment is the Detector Support System (DSS) penetrations due to mechanical constraints.

4 x calibration

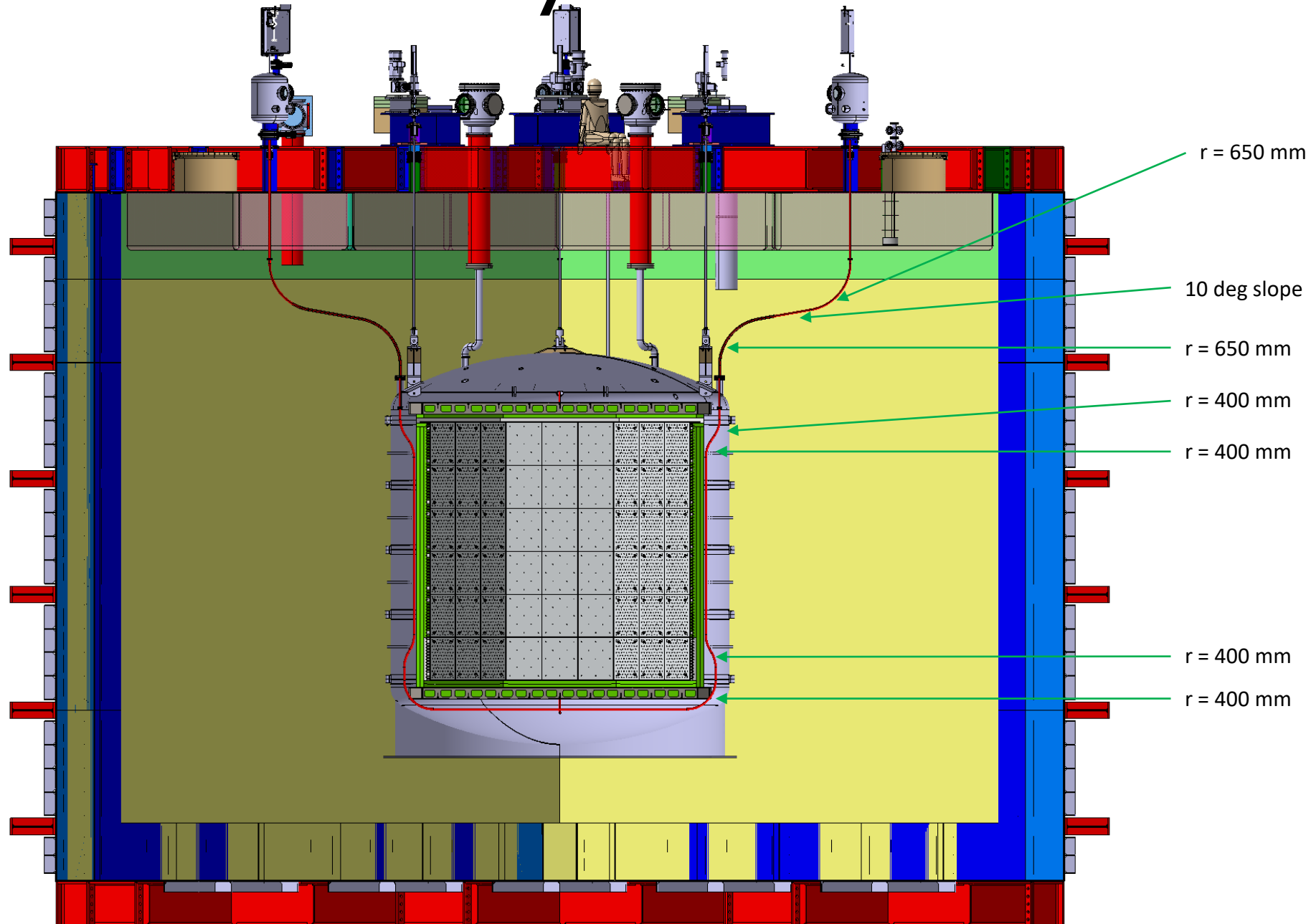
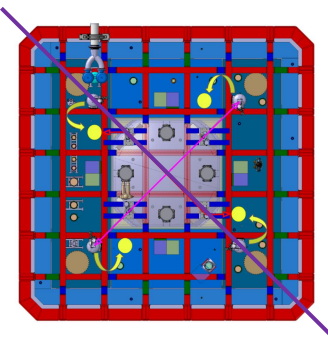
4 x signals chimneys

4 x DSS penetrations





# Cryostat 45° Section



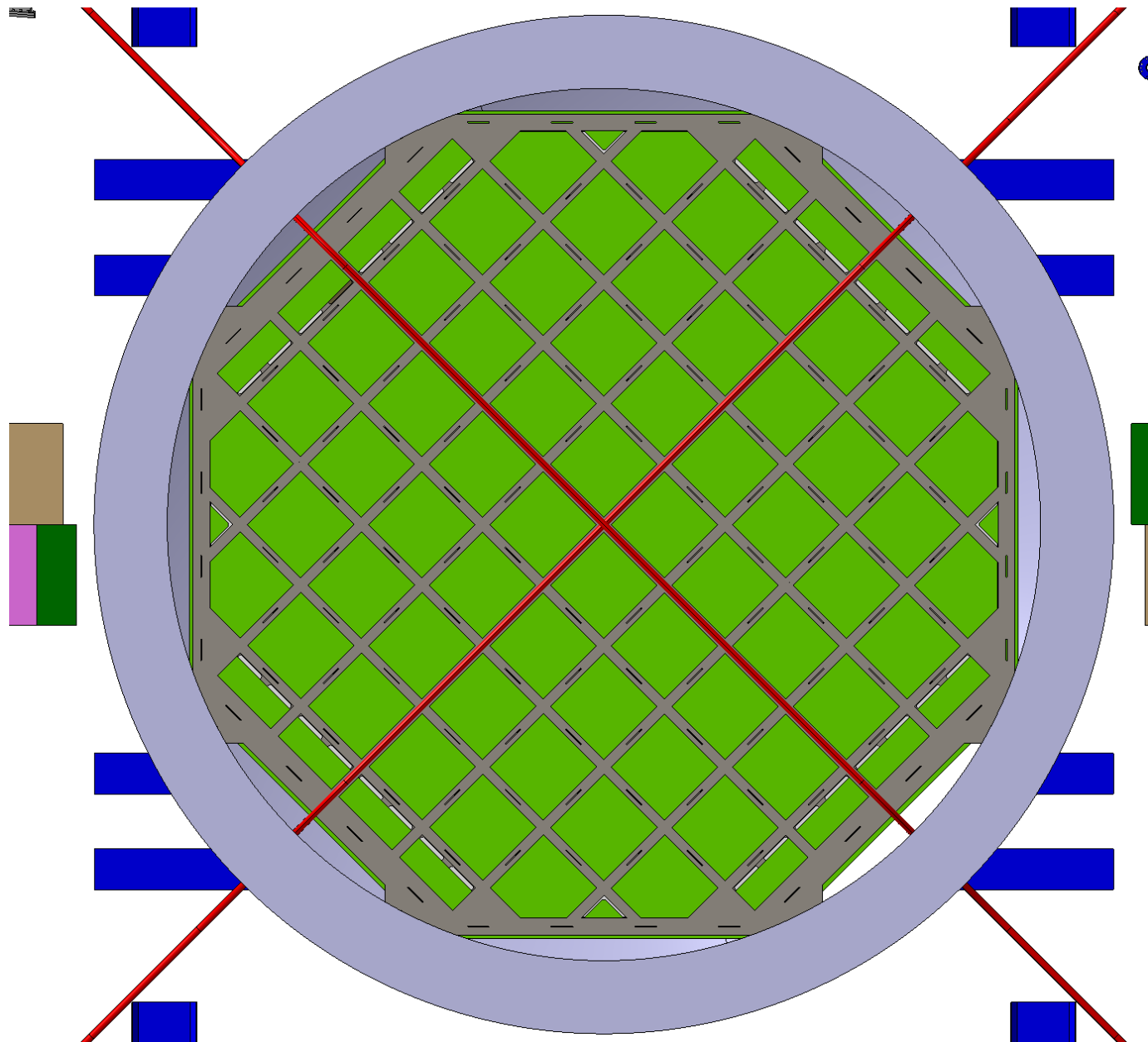
Features kept:

1. 30 mm distance tube axis to TPC external wall;
2. 2 bending on top and 2 on bottom (400 mm radius) to avoid interference with optical planes structure.

Features added:

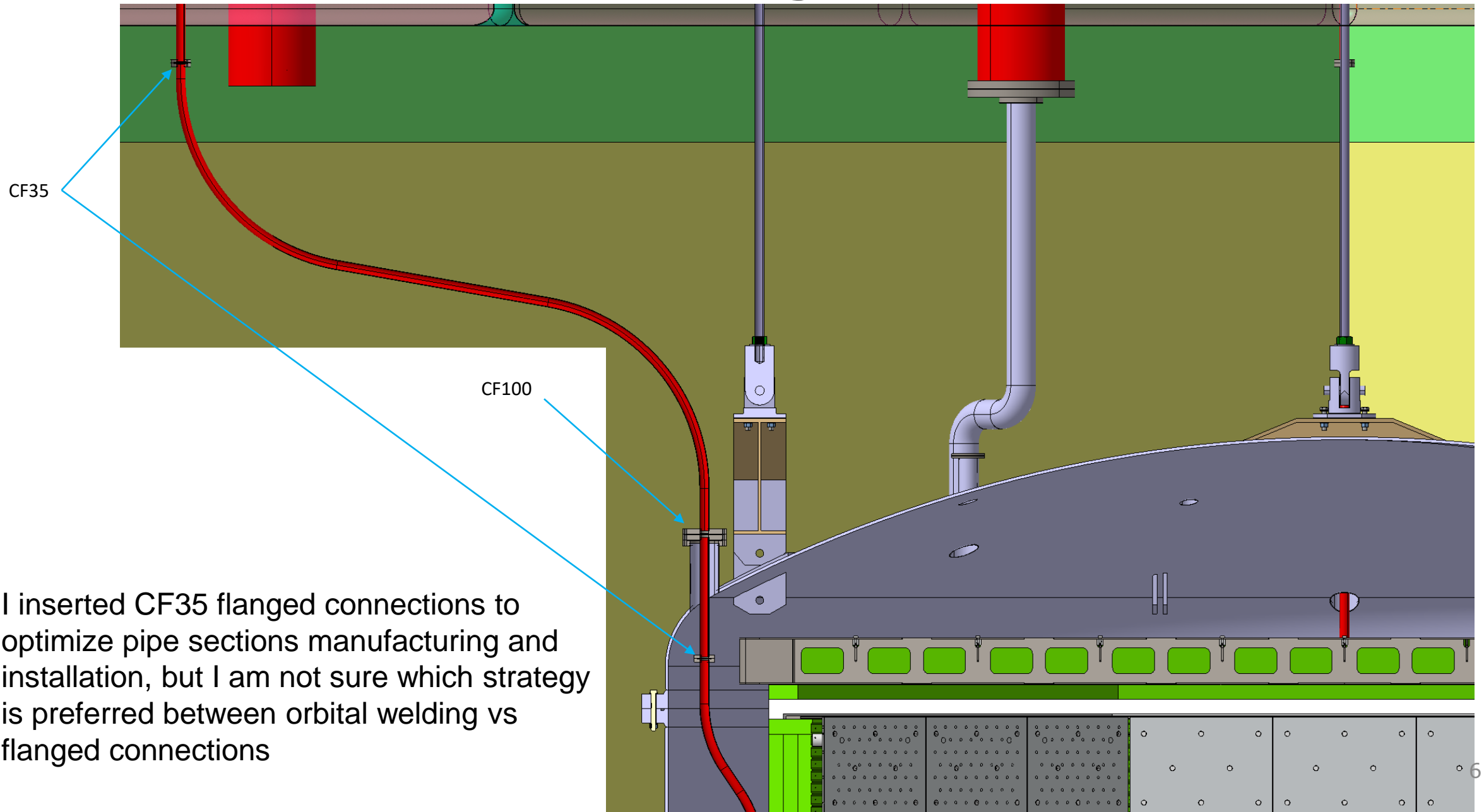
1. Flanged connections to ease the installation phase (to be discussed).

# TPC bottom view

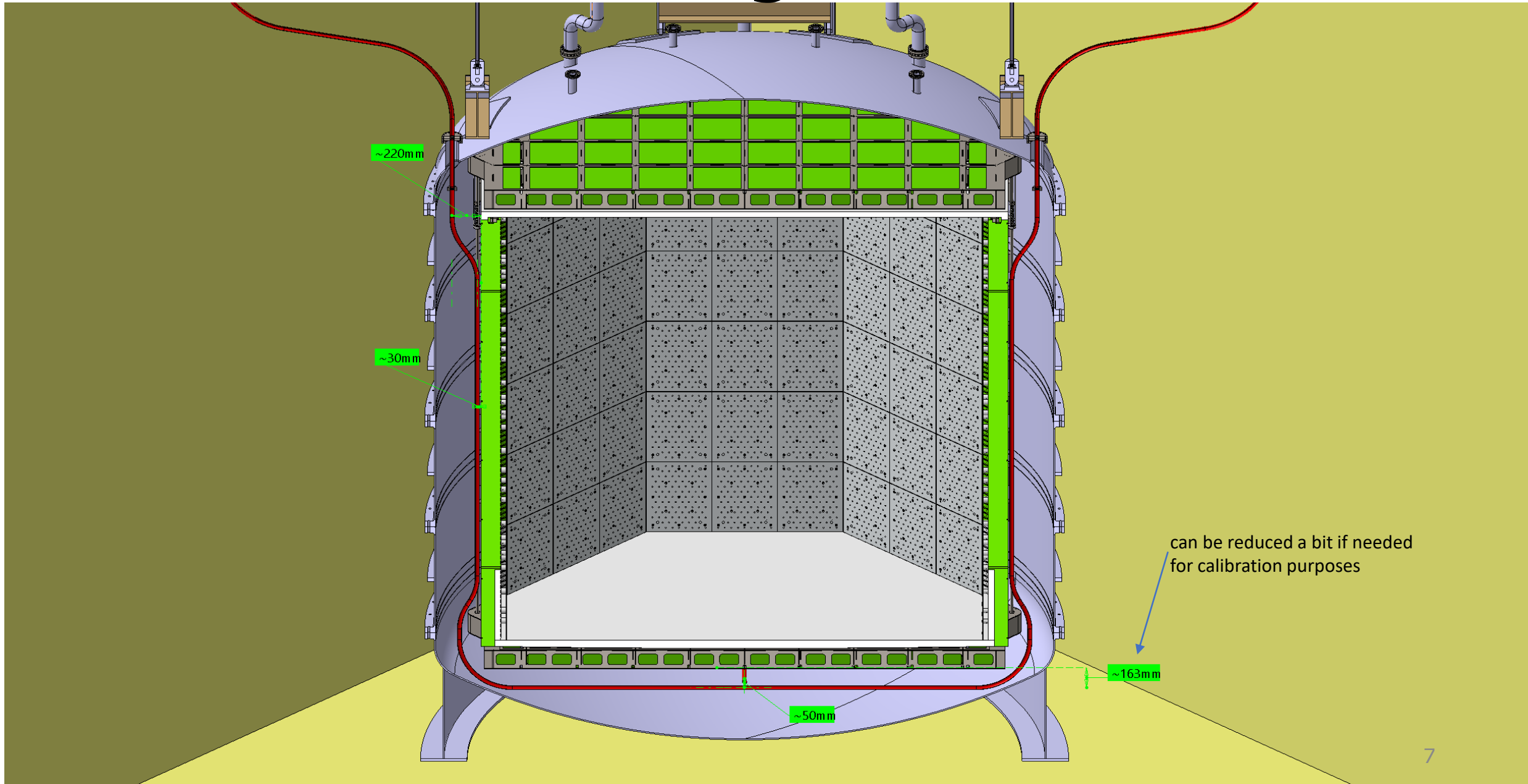


The orientation of the placement is based on TPC internal mechanics to simplify tubes fixture at the bottom and avoid interference with Veto acrylic blocks installation.

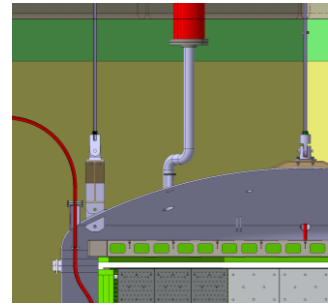
# Routing detail



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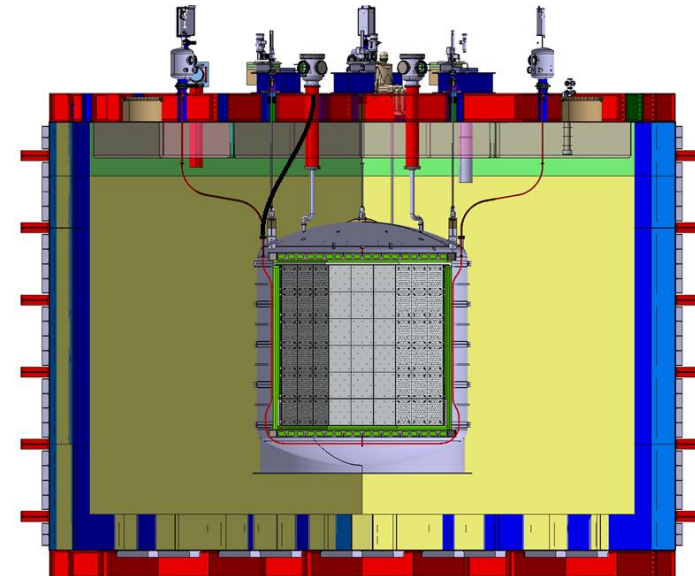


# Alternative ideas?



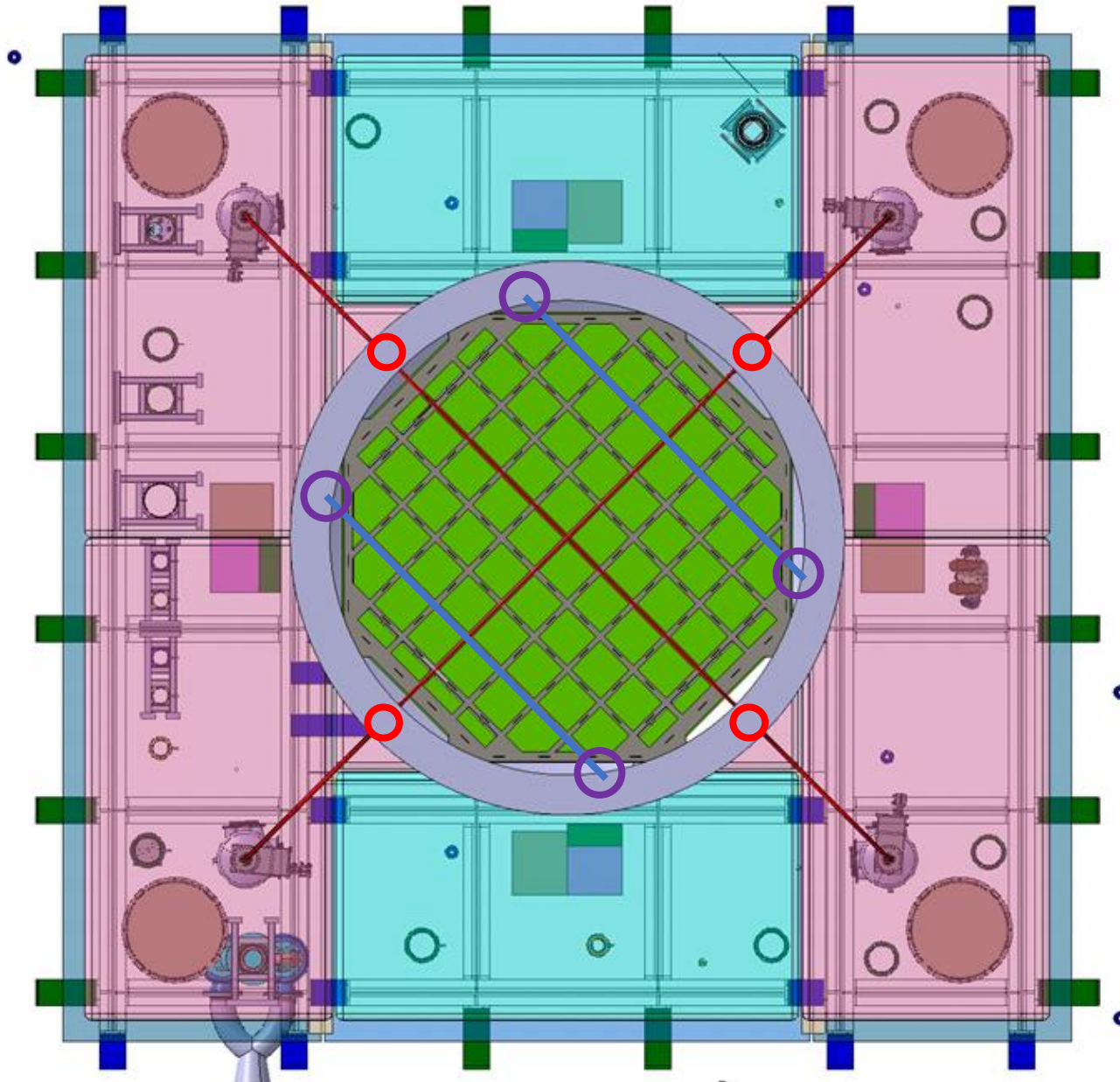
- Optimal circle for exit through the Ti vessel
- Where the calib pipe would exit without introducing any additional bent on top – unluckily crossing the tertiary membrane welding!

Possible alternative: bent inward and place calib penetrations where chimneys are – TBD with I&I, PE, TPC, etc...





# Alternative ideas?



— Possible routing

○ Where the calib pipe would exit without introducing any additional bent – unluckily crossing the primary membrane boundary!

○ DSS location