



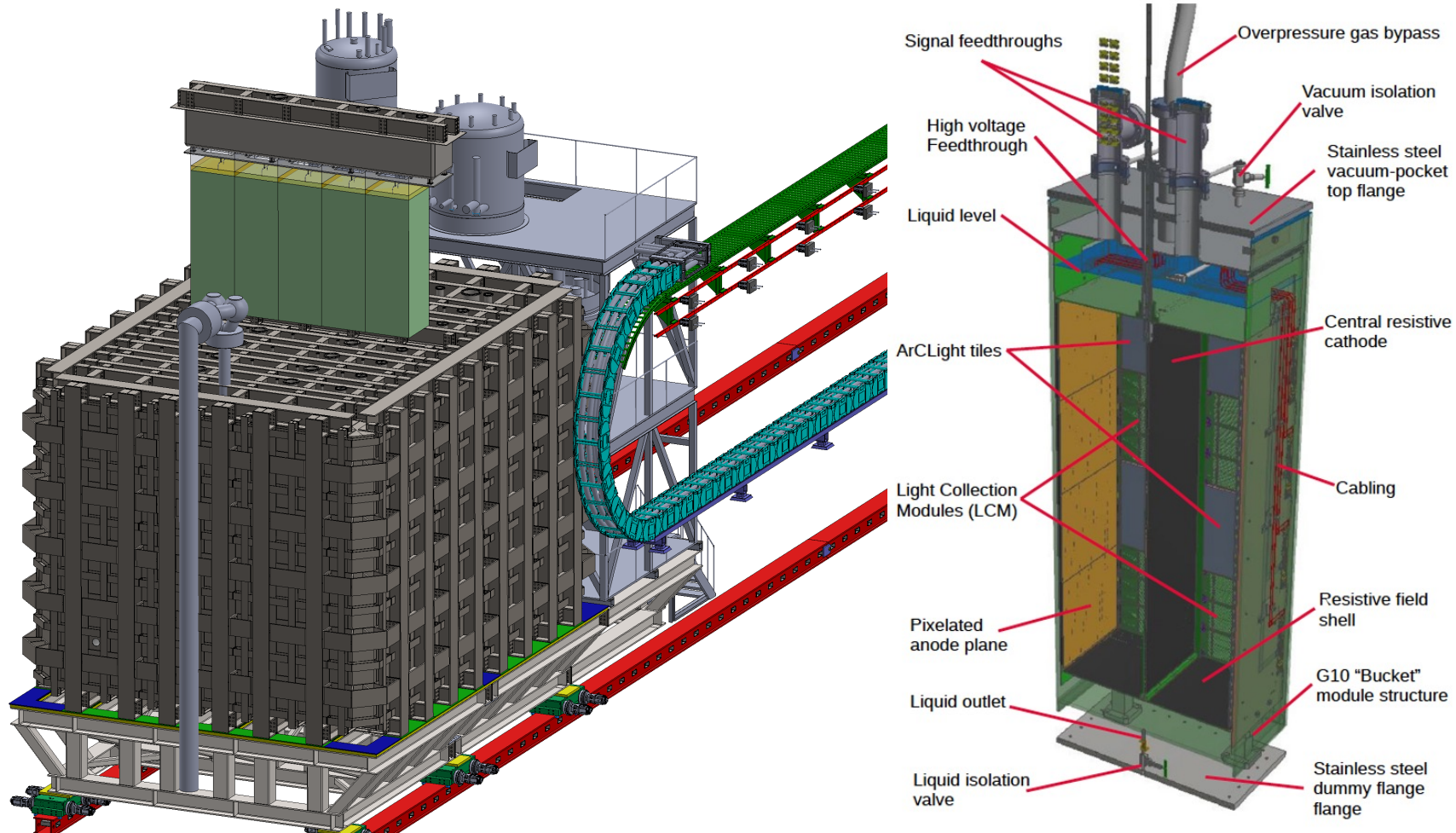
DUNE 2x2 Progress

ND All Hands Meeting
November 1, 2022

DUNE ND-LAr = 35 modular small TPCs

(instead of one single-volume TPC as in other near detectors)

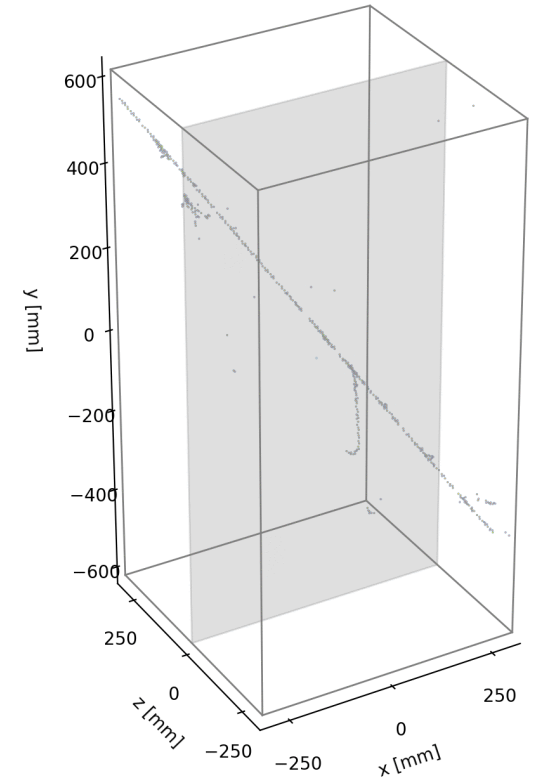
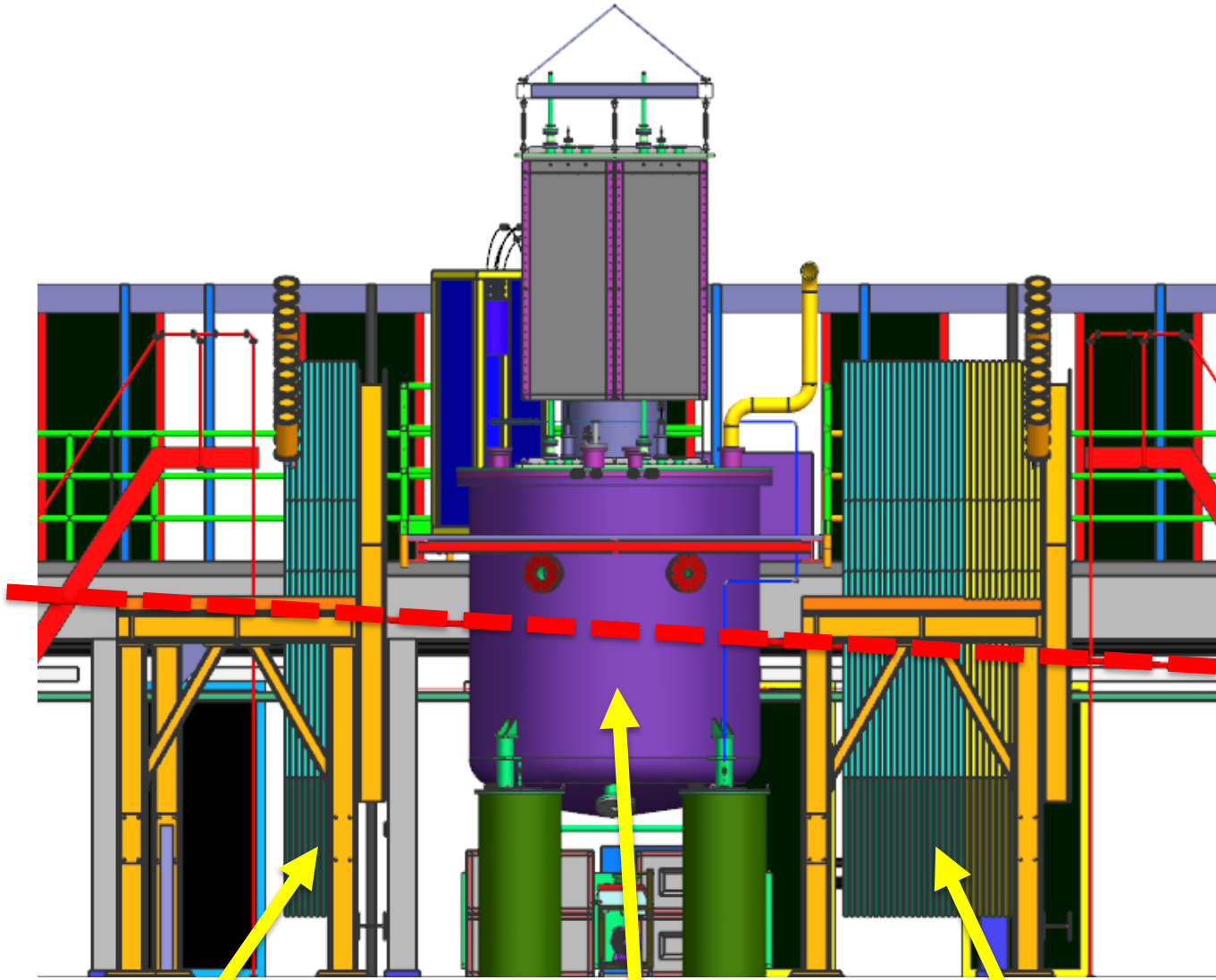
Near detector needs to handle more dense events



5 x 7 = 35 TPC modules

ArgonCube – 1m x 1m x 3m

DUNE 2x2 Detectors in MINOS

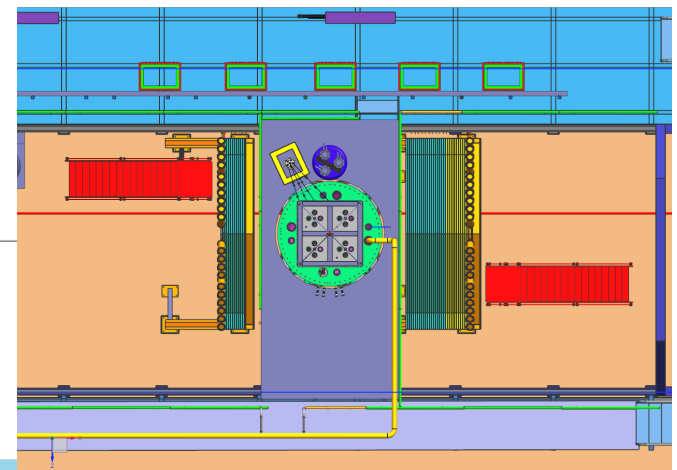


NuMI Beamline

12 MINERvA Modules

2x2 Cryostat and 4 TPCs

32 MINERvA Modules

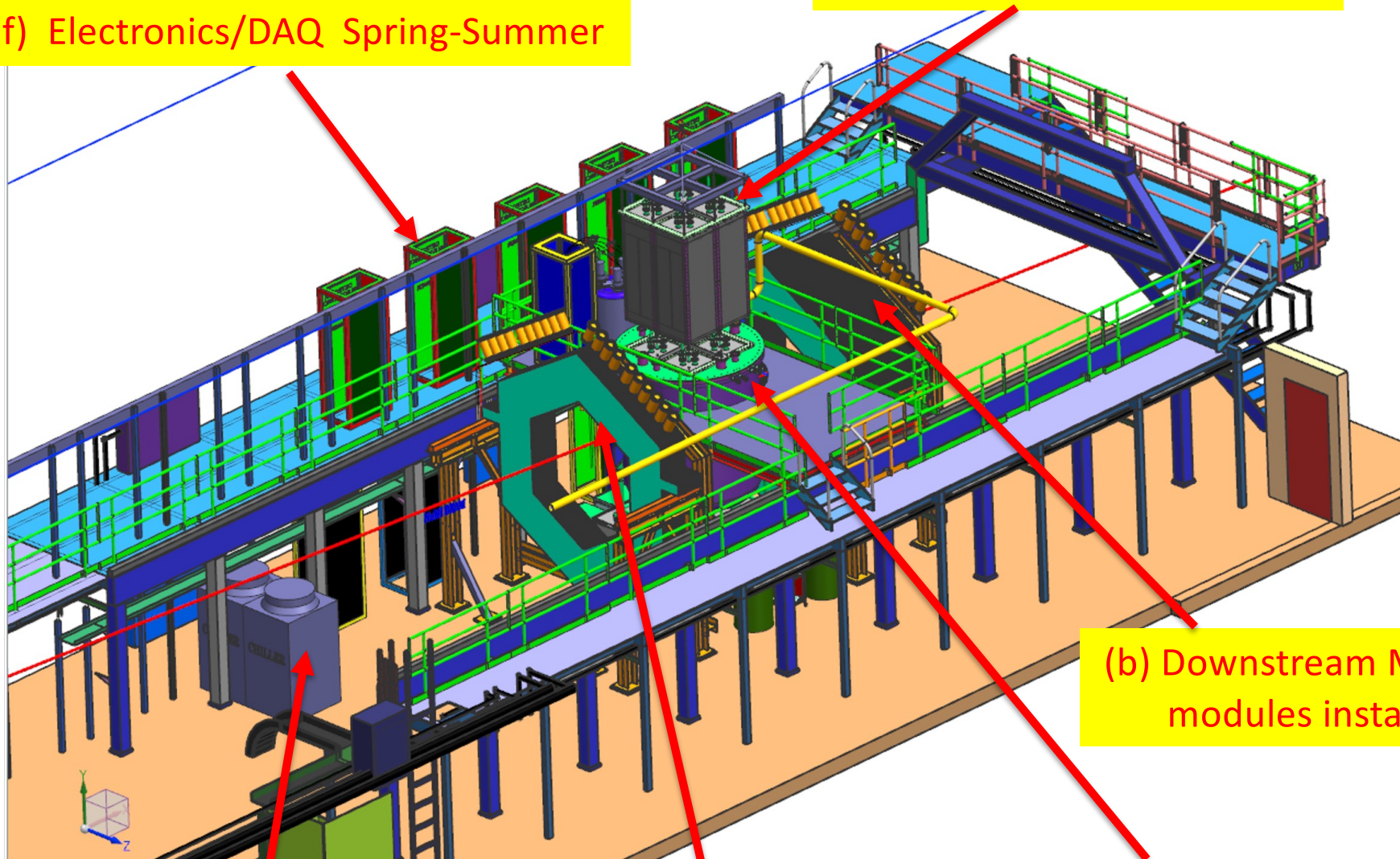


FTI

2x2 Status and Progress

(f) Electronics/DAQ Spring-Summer

(a) 2 of the 4 TPCs delivered



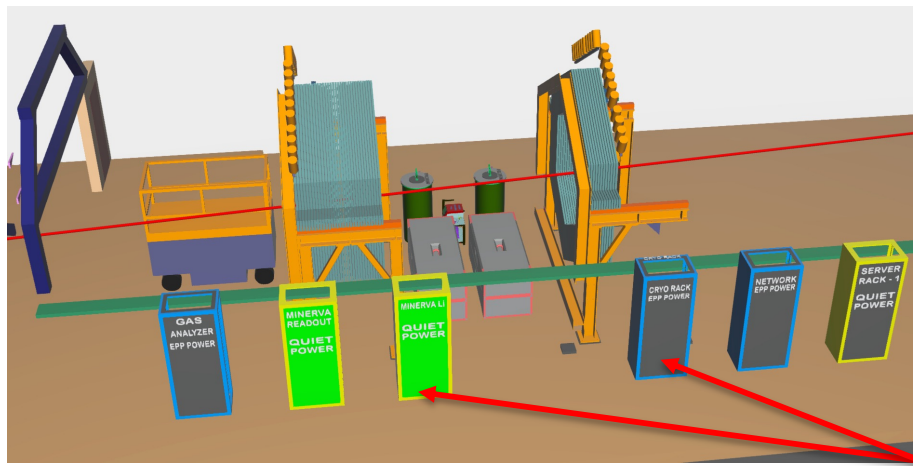
(b) Downstream Minerva modules installed

(e) Cryogenics installation starts in January 2023

(d) Upstream Minerva to be installed before holiday

(c) Cryostat and access platform installation starting this week

2x2-Minerva Installation



Layout of 2x2-Minerva



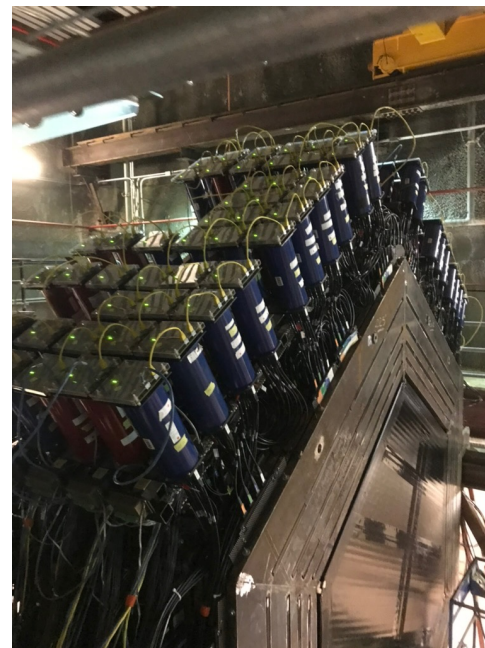
ORC for readout electronics
(Needed for PMT/FEB checkout)



Module placement



PMT/FEB installation and cabling

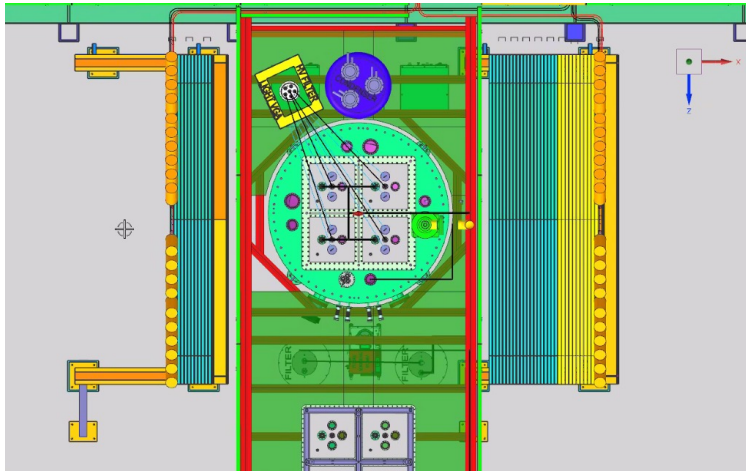


Module PMT/FEB

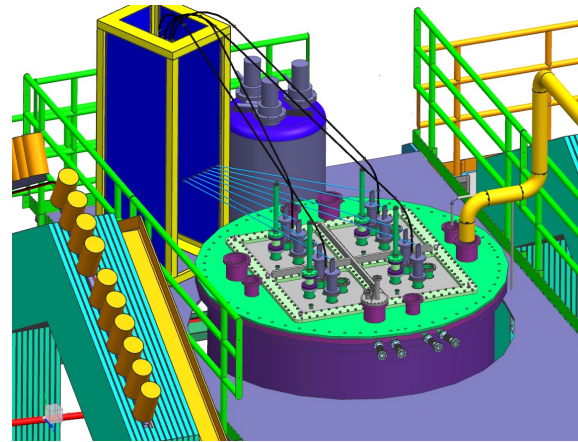


Safety review of PMT repair scheme

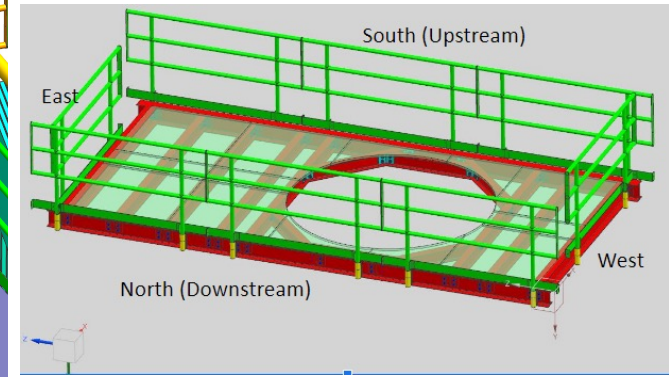
Cryostat and Access Platform Installation



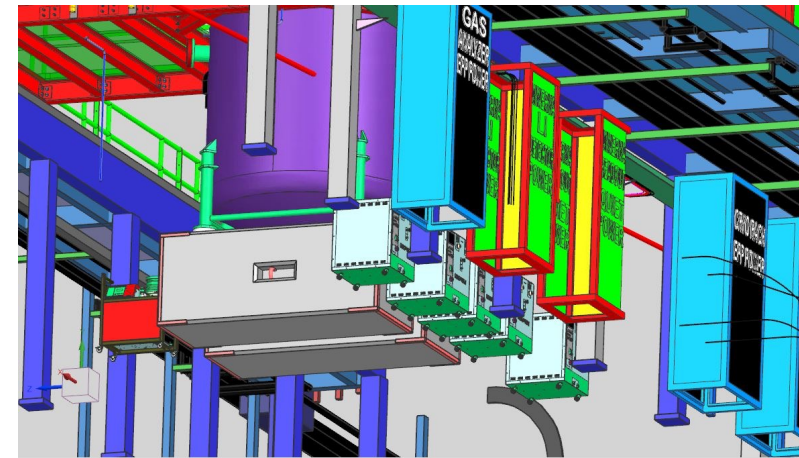
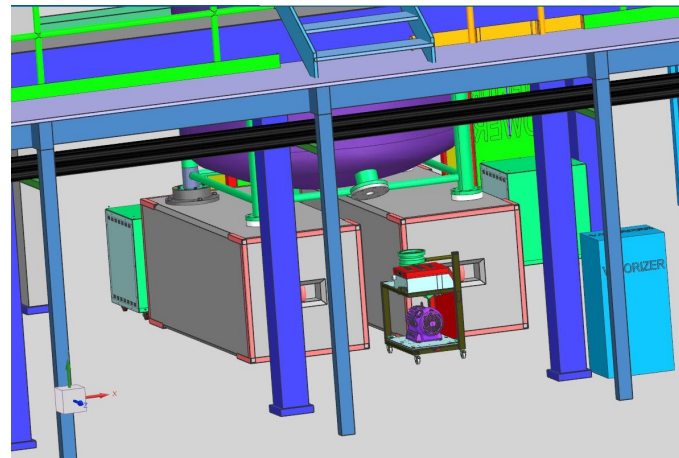
Cryostat placement



Access platform



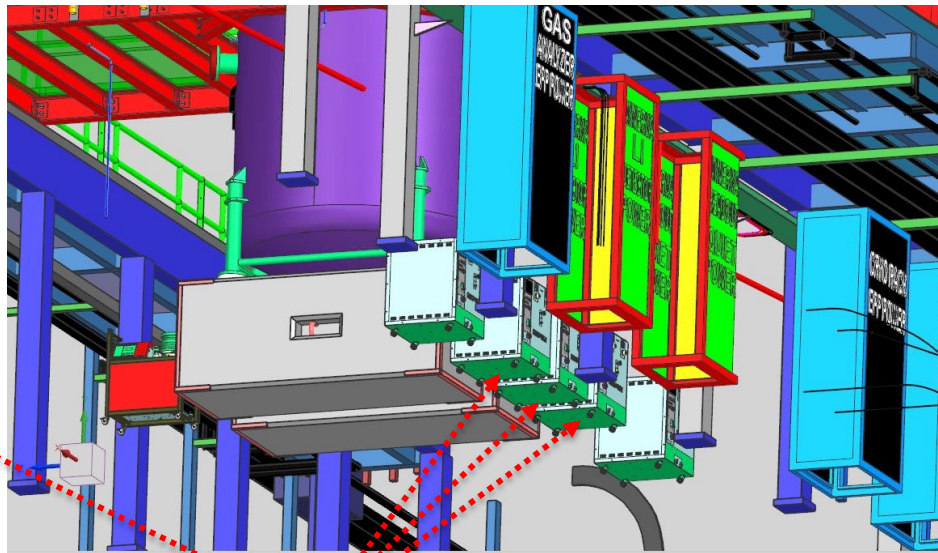
Cryostat transfer cart



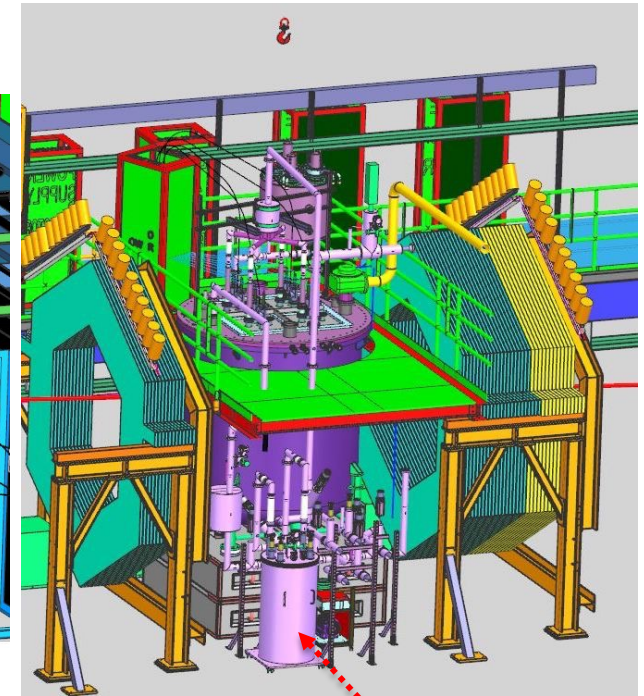
Cryostat support

Cryogenics Installation Starts after Holiday

- Major cryogenics equipment in hand or scheduled to deliver
 - Cryocoolers and condenser were delivered
 - Purification filter vessels delivery in February
- Final piping and power designs close to completion
- Installation to start after 2x2-Minerva installation – Jan'23

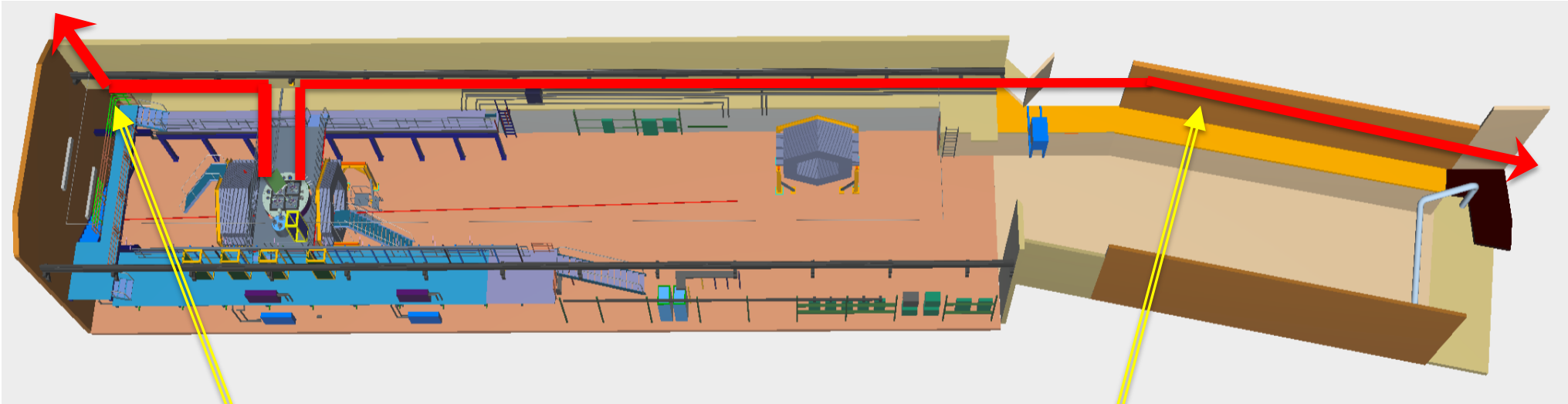


Cryocooler system



Piping and purification filters

Venting and ODH Mitigation in MINOS Hall



ODH fan and ductwork



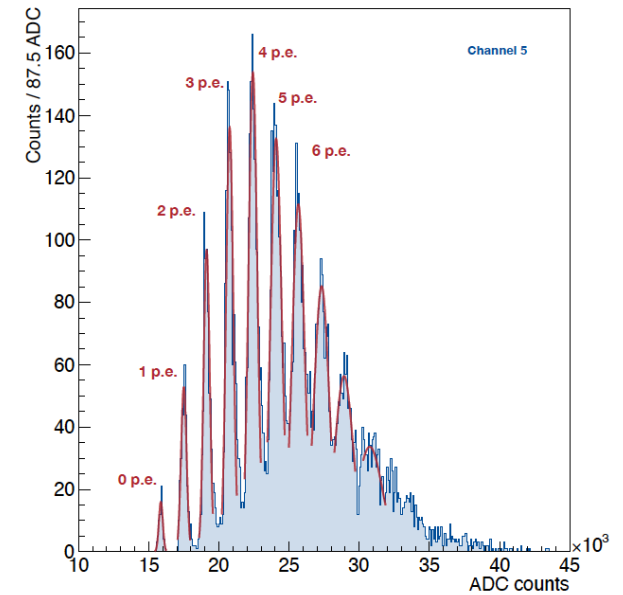
- Fan's CFM to be doubled
- Working with ISD (FESS)

Cryostat venting



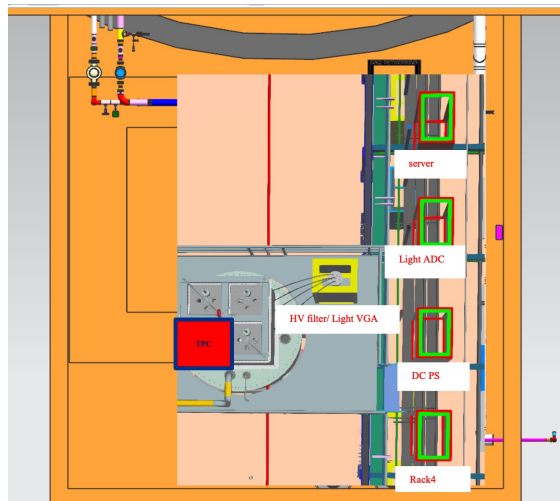
Pressure tested the vent pipe behind shaft elevator

TPC Module Test and Electronics Integration

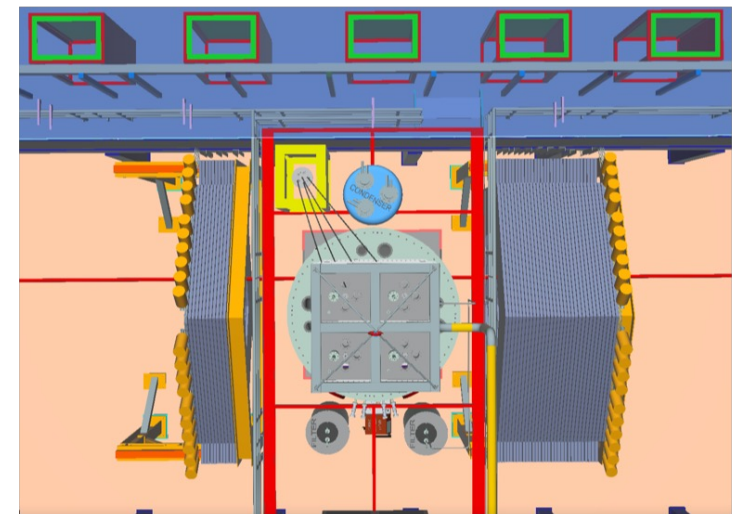


First 2 TPC modules in LArTF, readout electronics SEDR and ORCed

Light readout ADC response to LED (Vanessa Cerrone, Italian summer students)



LArTF electronics setup uses 2x2@MINOS design



Summary of 2x2 Progress

- Major detector component to be installed before holiday break
 - Downstream 2x2-MINERvA modules completed
 - Cryostat and access platform to be installed in couple of weeks
 - Upstream 2x2-Minerva modules to be completed before holiday break
- Major cryogenics equipment in hand; Installation to start soon
- Last two TPC modules expect to arrive February/March
- Hoping to start cryogenics and detector commissioning in summer 2023
- **Big Thanks** to TSD for engineering support