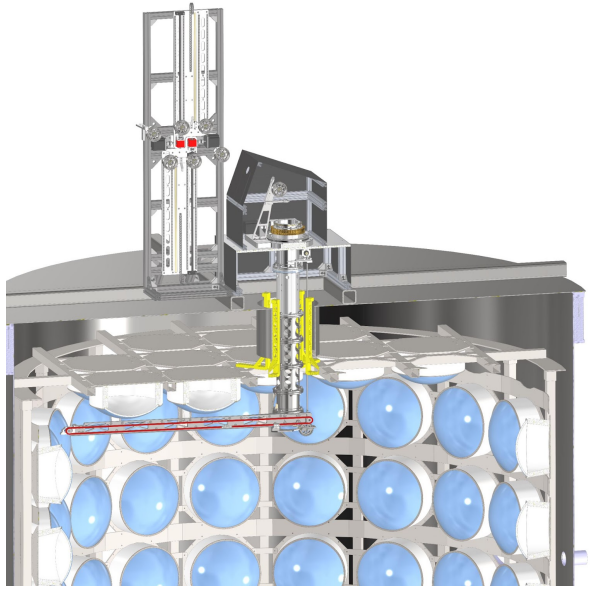
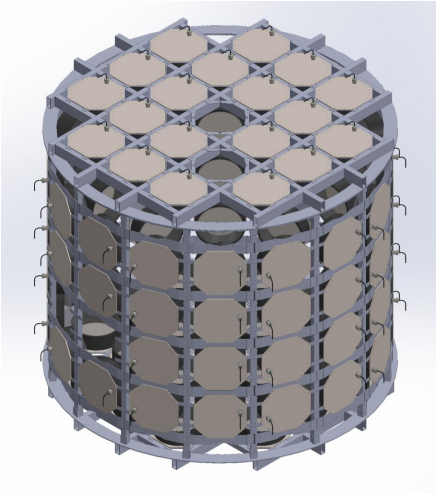
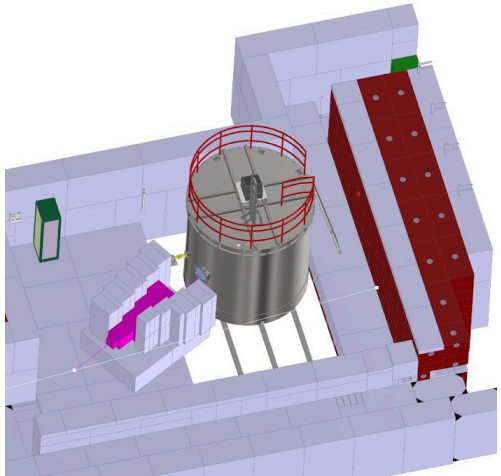


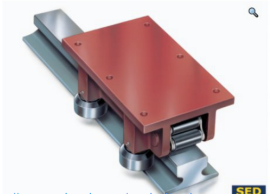
WCTE Mechanical Structure overview

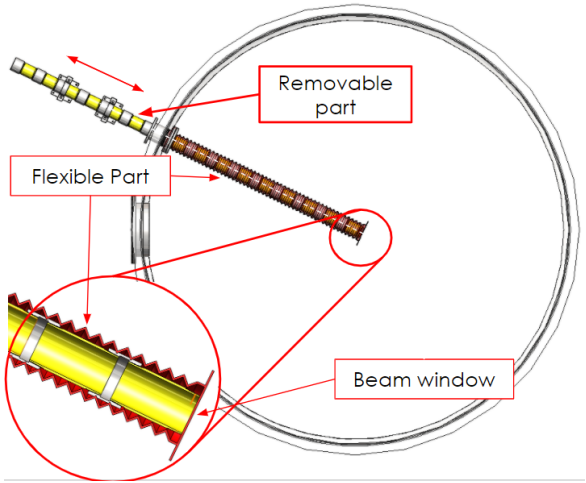
Akira Konaka
(TRIUMF)

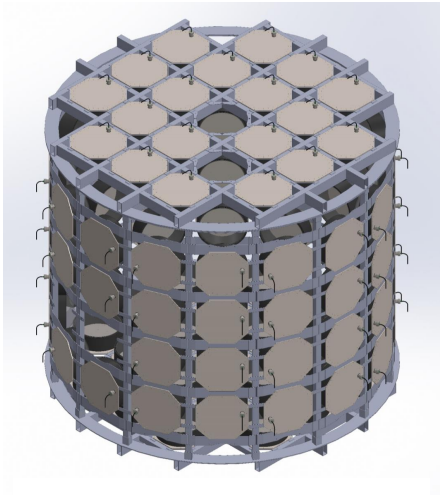
November 28, 2021









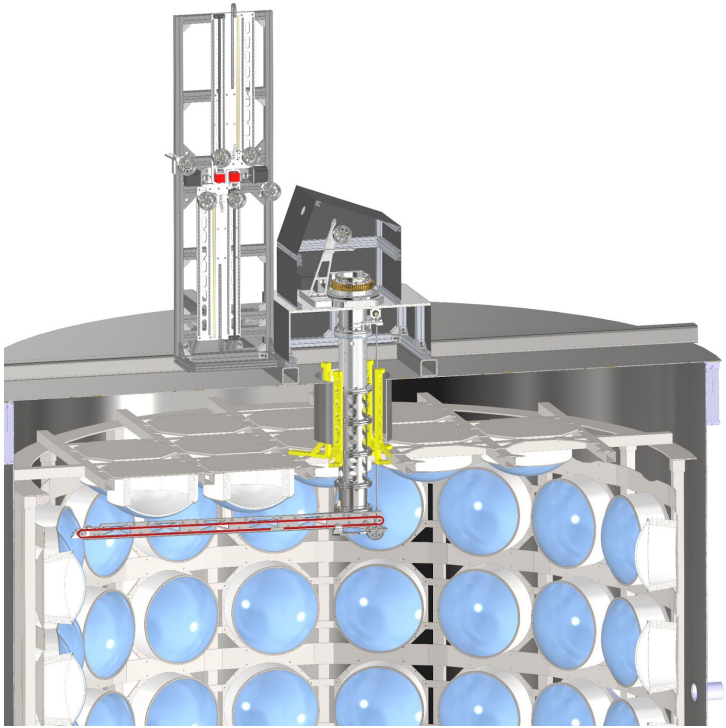


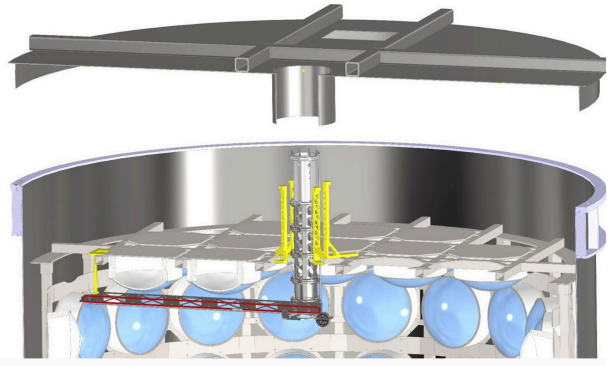
- WCTE tank and support structure design
  - WCTE tank size is reduced
    - to fit the wall and ceiling of the east hall
      → Oliver Jeremy's talk
    - 4 rows and 16 columns of mPMT
  - Engineering studies
    - engineering design → Saurabh Patil's talk
    - confirmed by simulation studies
      → Shadul Joshi's talk

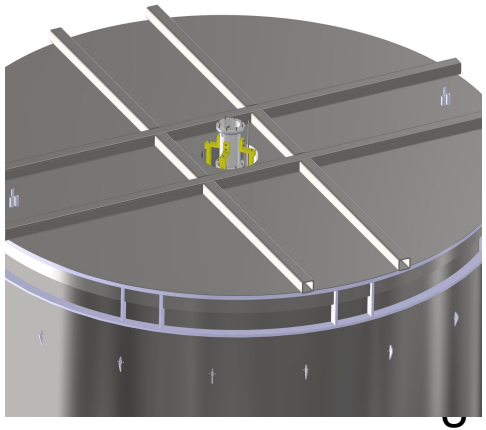
- Tank, support structure, Lid are funded and constructed in Spain (Pablo Fernandez)
  - Design study by VIIT (India) group

Designed by Oliver Jeremy

- Tank lid support services
  - Central deployment system (CDS)
  - water system: still need to be designed
- Safe structure to work on top of the lid
  - strength, access

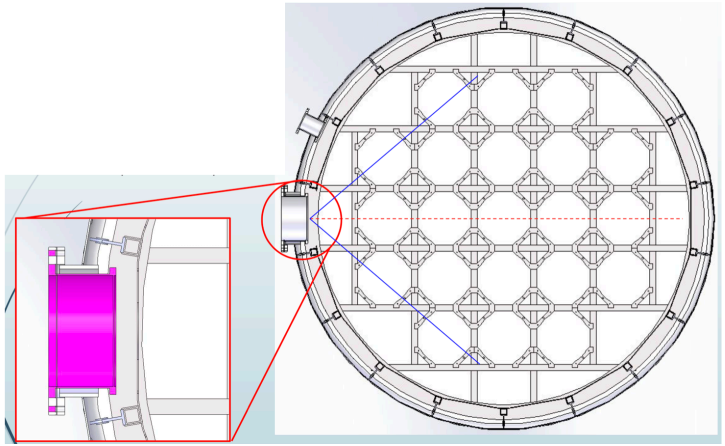


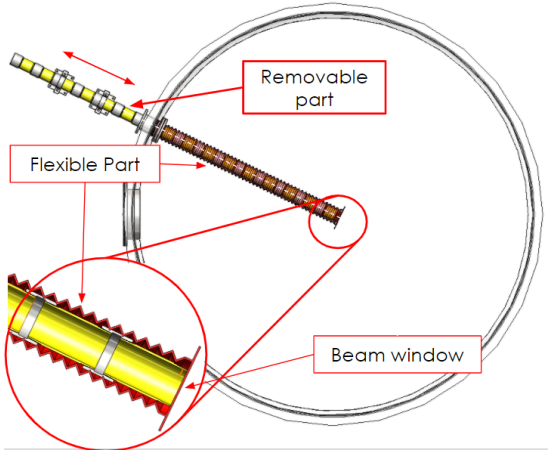




Beam windows

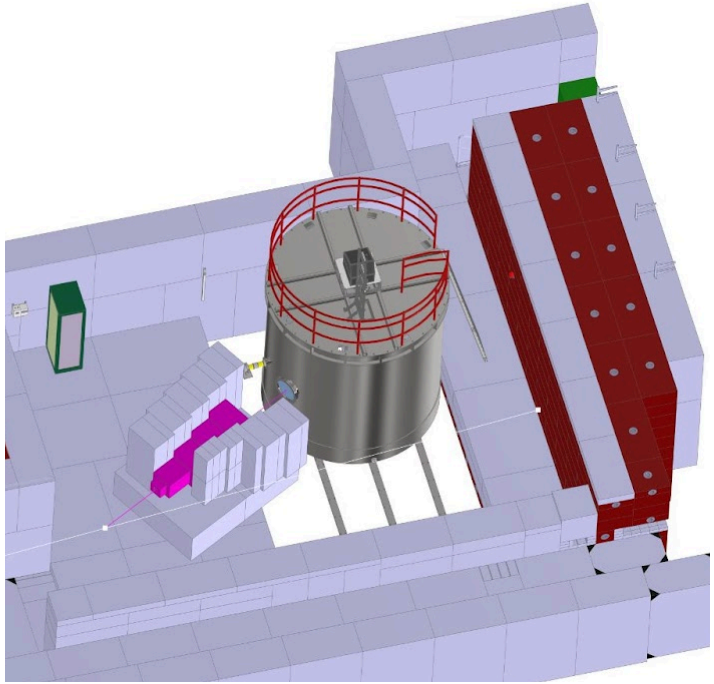
- Tertiary beam window
  - 50cm in diameter
    - mechanical strength (VIIT)
  - shadowing effect
    - flange extended inside the tank?
    - or just 6mm tank wall sufficient?
- Secondary beam window
  - 10cm diam. flexible pipe extension
- Initial window designs by Shubham Garode
  - realistic engineering design required
  - simulation study talk by Yassine

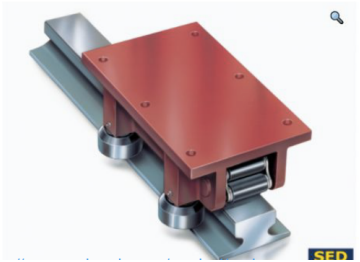




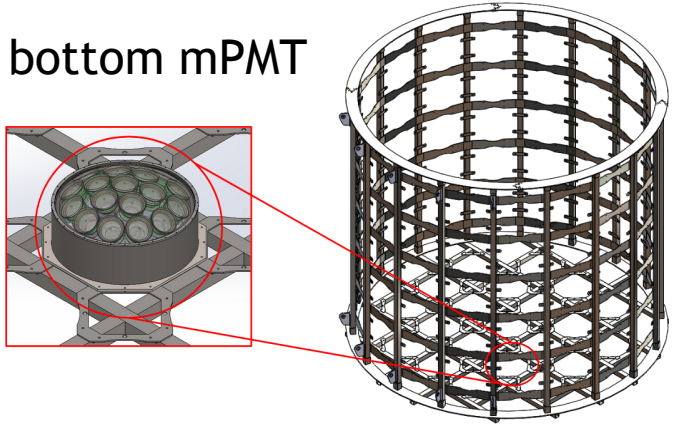
Tank in the T9 area

- Tank moving system
  - tertiary ⟷ secondary beams
  - Initial design by Oliver Jeremy
    - using CERN standard roller
  - simulation study by VIIT (India)
  - CERN transport group implements
    - as a part of “Change Request”
- Safety access
  - access to the top lid with railing
  - access to the bottom pit with rails
  - initial safety document submitted
    - detailed access design to be developed

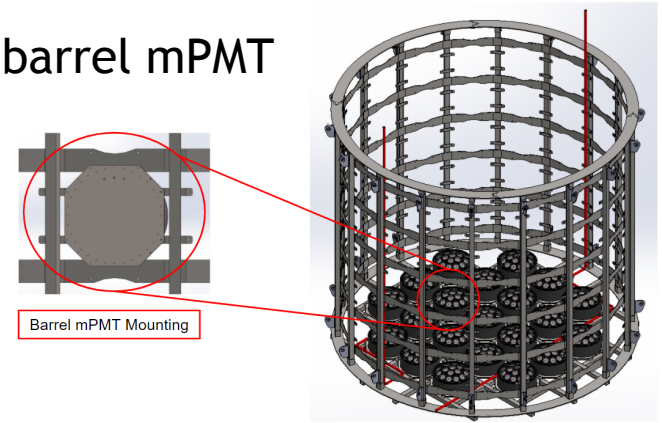




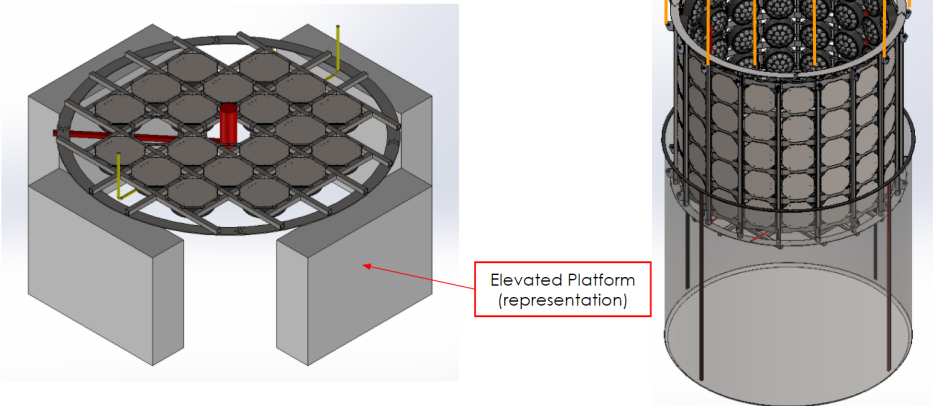
bottom mPMT



barrel mPMT



top mPMT



- Assembly logistics design by VIIT
  - mPMT mounting
    - movable scissor lift is considered
    - mPMT is heavy and crane needed
  - installation into the tank

- VIIT group performs mechanical design and assembly
- Imperial college group did intial design for
  - lid and its access → Spanish group
  - moving system → CERN transport group
- Spanish group constructs tank, support and lid
- VIIT and Korean group collaborate on black sheet
- We need a group responsible for the beam windows

- Report by Prof.Garde and Pablo on the planning
  - will be summarized into the technical design report

- Progress in mechanical design
  - most of the components are covered
  - involvement of CERN beamline, safety, and transport group
    - safety report submitted and reviewed by the CERN safety
    - T9 change request is submitted by CERN beam group
- Construction design is the next step
  - leadership: Chandrashekhar Garde, Pablo Fernandez
  - TDR to be prepared
  - plan will be provided at the end of this mechanical session