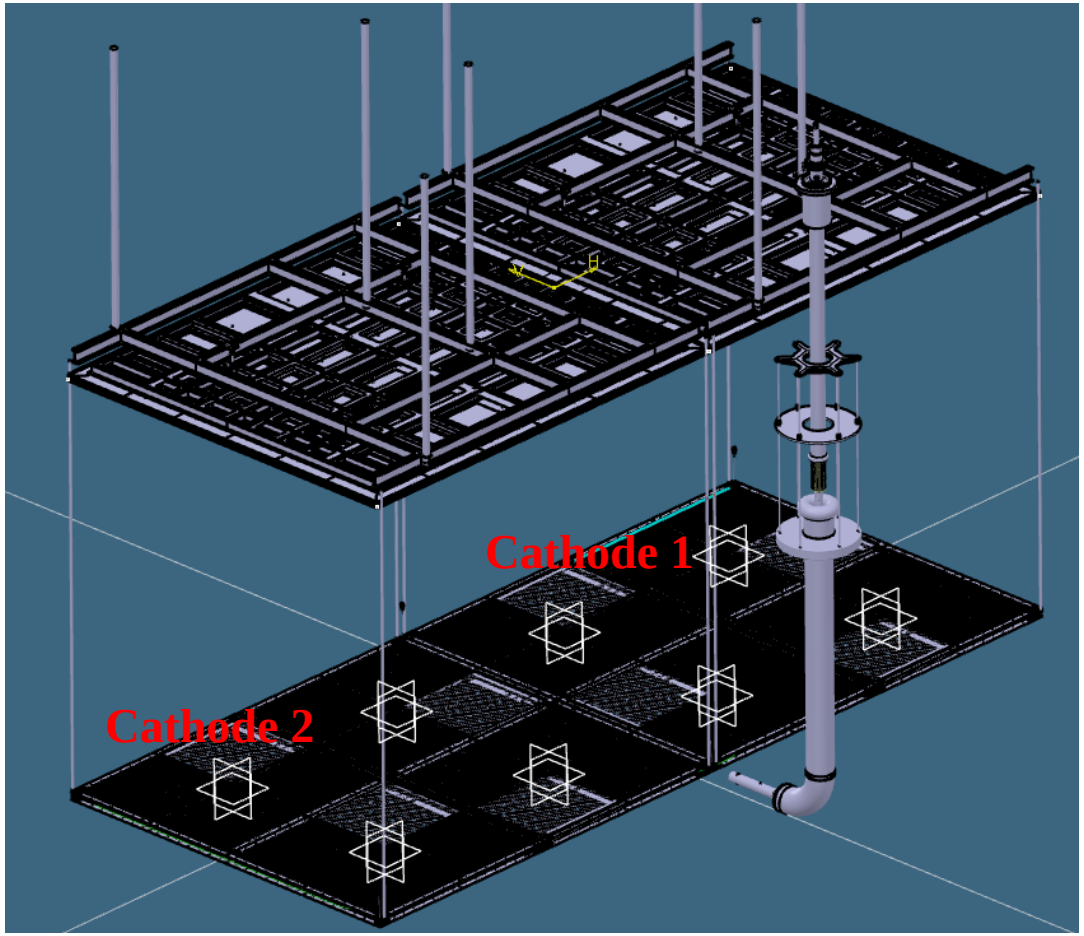
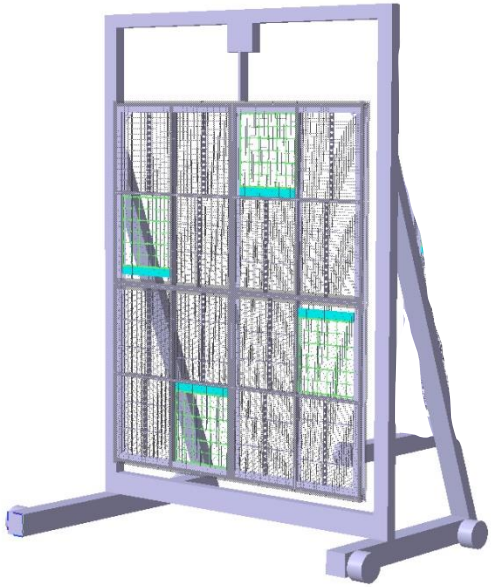
Cathode Installation for Module 0

- Hypothesis:
  - the two cathodes will be raised independently
  - No balun box and copper distribution for PD on Cathode 1

- Unknowns: routing of the PD fibers from the cathode to the penetrations



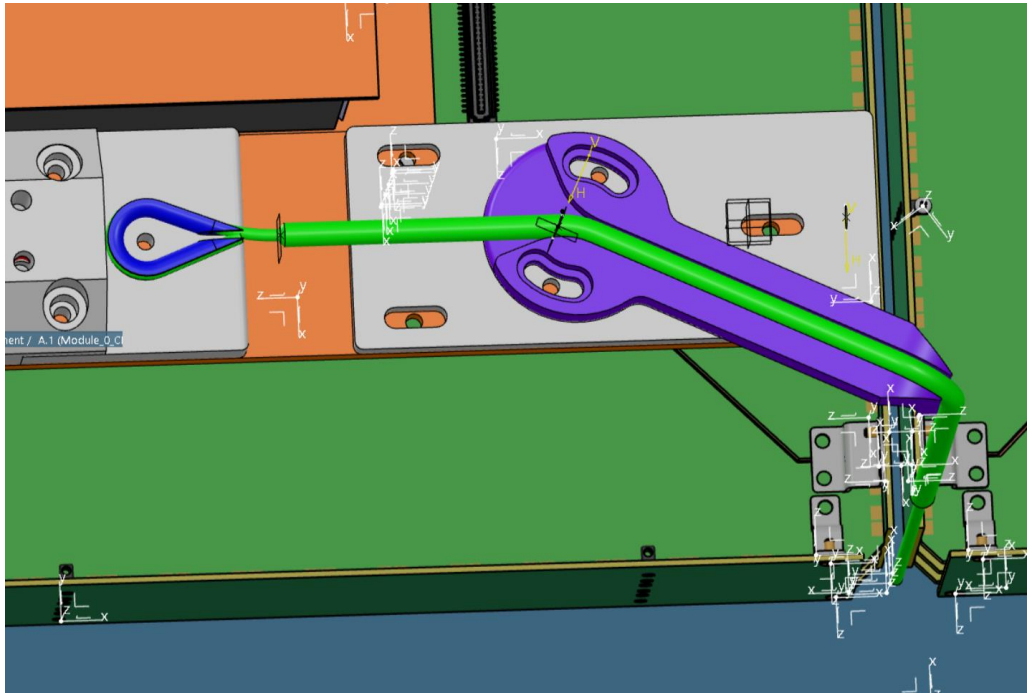
Installation Steps



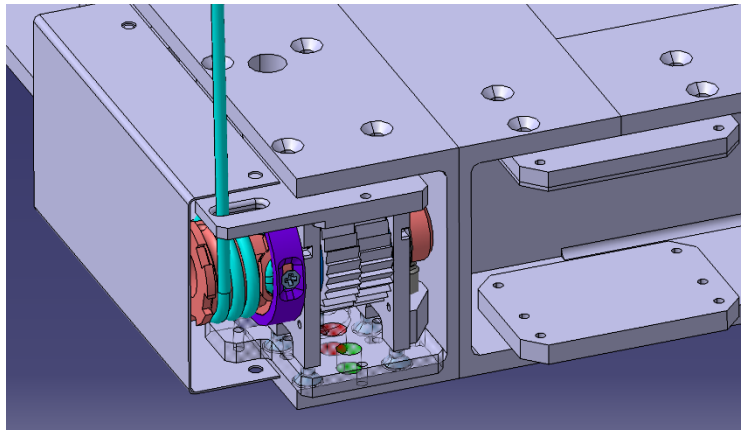
1. Cartwall parts introduction in ***NP02 clean room*** and Cartwall mounting: **1 day.** Need crane

2. Installation of TADs for Cathode 1 (C1) on CRP structure: **2 hours**. With CRP team. In ***NP02 clean room once CRP inox frame is hanged and set at human level***

3. Installation of TADs for Cathode 2 (C2) on CRP structure: **2 hours.** With CRP team. In ***NP02 clean room once CRP inox frame is hanged et set at human level***



4. C1 assembly (Step 1 completed). Work in ***NP02 clean room***
   a. Introduction through the roof of the 2 ½ cathodes: **1 hour?** Need crane. If done with step 1, how to store the ½ frames ?
   b. C1 assembly and gluing: ½ **day** (+ ½ **day** of drying)
   c. C1 resistive mesh and LAD installation: ½ **day** in parallel with drying.



   d. C1 PDs fibers installation by PD team: **Duration and procedure to be given by PD. Help of cathode team ?**
   e. C1 PDs Modules installation by PD team: **Duration and procedure to be given by PD. Help of cathode team ?**
   f. C1 conductive mesh installations: **2 hours**
   g. Milestone: C1 ready for introduction in NP02.

5. C1 transferred through TCO ***in NP02 and stored horizontally in NP02 on table with wheels*** (Step 4 completed). **Duration?** Which tools for TCO transfer? Use of insertion tool for CRP under study

6. C2 assembly (Step 5 completed (Cartwall has to be free)). Work in ***NP02 clean room***
   a. Introduction through the roof of the 2 ½ cathodes: **1 hour?** Need crane. If done with step 1 or 4.a, how to store the ½ frames ?
   b. C2 assembly and gluing : ½ **day** (+ ½ **day** of drying)
   c. Installation of balun box for PD by PD team. **Duration and procedure to be given by PD. Help of cathode team ?**
   d. C2 resistive mesh and LAD installation: ½ **day** in parallel with drying depending on balun box and copper distribution installation.
   e. C2 PDs fibers installation by PD team: **Duration and procedure to be given by PD. Help of cathode team ?**
   f. C2 PDs Modules installation by PD team: **Duration and procedure to be given by PD. Help of cathode team ?**
   g. C2 conductive mesh installations: **2 hours**
   h. Milestone: C2 ready for introduction in NP02.

7. Tuning of TAD position and ropes installation for C1 (Step 2 completed): **2 hours**. With CRP team. ***In NP02***

8. Connection of C1 to ropes, raising by few centimeters (with CRP team) and tuning with respect to top anode (Step 5 and 7 completed): ½ **day.** ***In NP02***

9. C1 raised at nominal height (Step 8 completed): ½ **hour** With CRP team. ***In NP02***

10. Tuning of TAD position and ropes installation for C1 (Step 3 completed): **2 hours**. With CRP team. ***In NP02***

11. C2 transferred from NP02 clean through TCO ***in NP02 and stored horizontally in NP02 on table with wheels*** (Steps 6 and 8 completed). **Duration?** Which tools for TCO transfer? Use of insertion tool for CRP under study

12. Connection of C2 to ropes , raising by few centimeters (with CRP team) and tuning with respect to top anode (Step 10 and 11 completed): ½ **day**. ***In NP02***

13. C2 raised at nominal height (Step 12 completed): ½ **hour** With CRP team. ***In NP02***

14. C1 connected to HV bus (Step 9) : 2 hour ? How many connections to be done? Who? ***In NP02***

15. C2 connected to HV Bus and C1 (Steps 9 and 13 completed) : 2 hour ? How many connections to be done? Who? ***In NP02***

16. Distance Survey of C1 and C2 with respect to top anodes (Steps 14 and 15 completed): **2 hours** (to be done 24 hours after raising and after PD fibers have been routed to the penetrations) ***In NP02***

Conclusion

- **Total Duration** (without margins and interferences with other activities): **~8 days** (PD installation excluded)
- Main uncertainty due to PD installation
- Strong interplay with Top CRP installation. Interfaces and shared work agreed with LAPP group
- Most of the work will take place in NP02 clean room and NP02
- Some open points **to be clarified**
  - Transfer through TCO (under study)
  - Connection to HV bus