

Design & Construction

Part 1/3 LIME and Co...

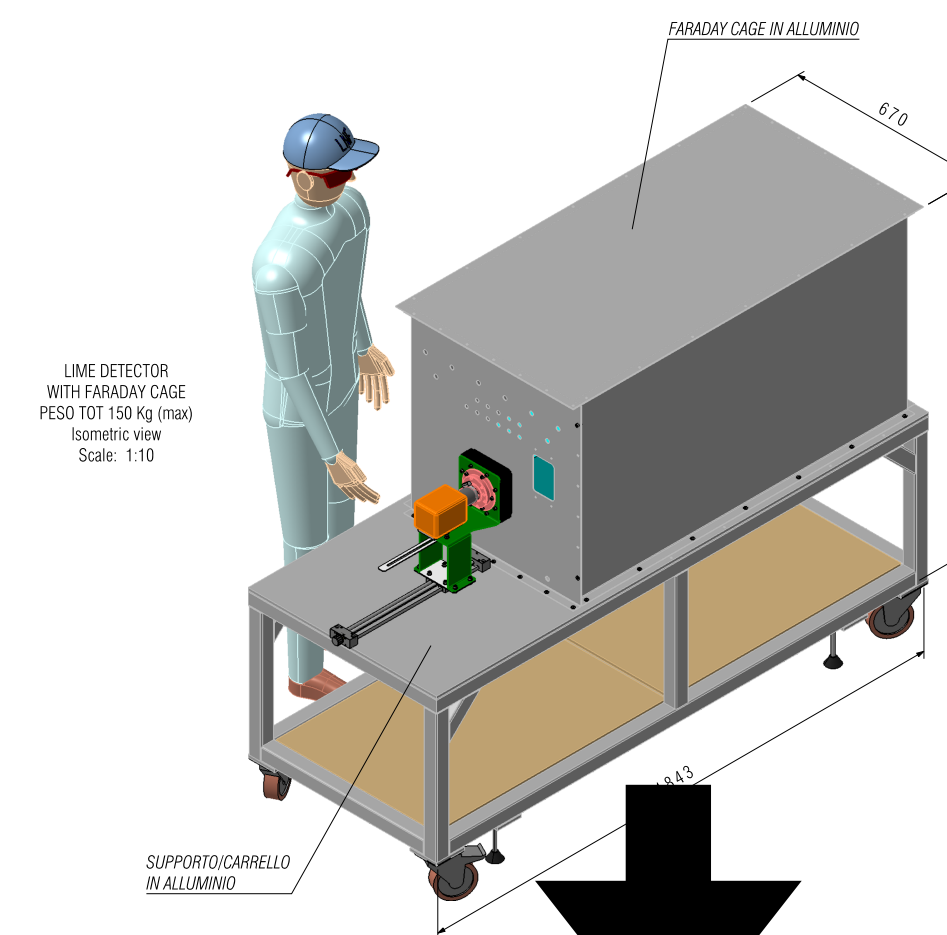
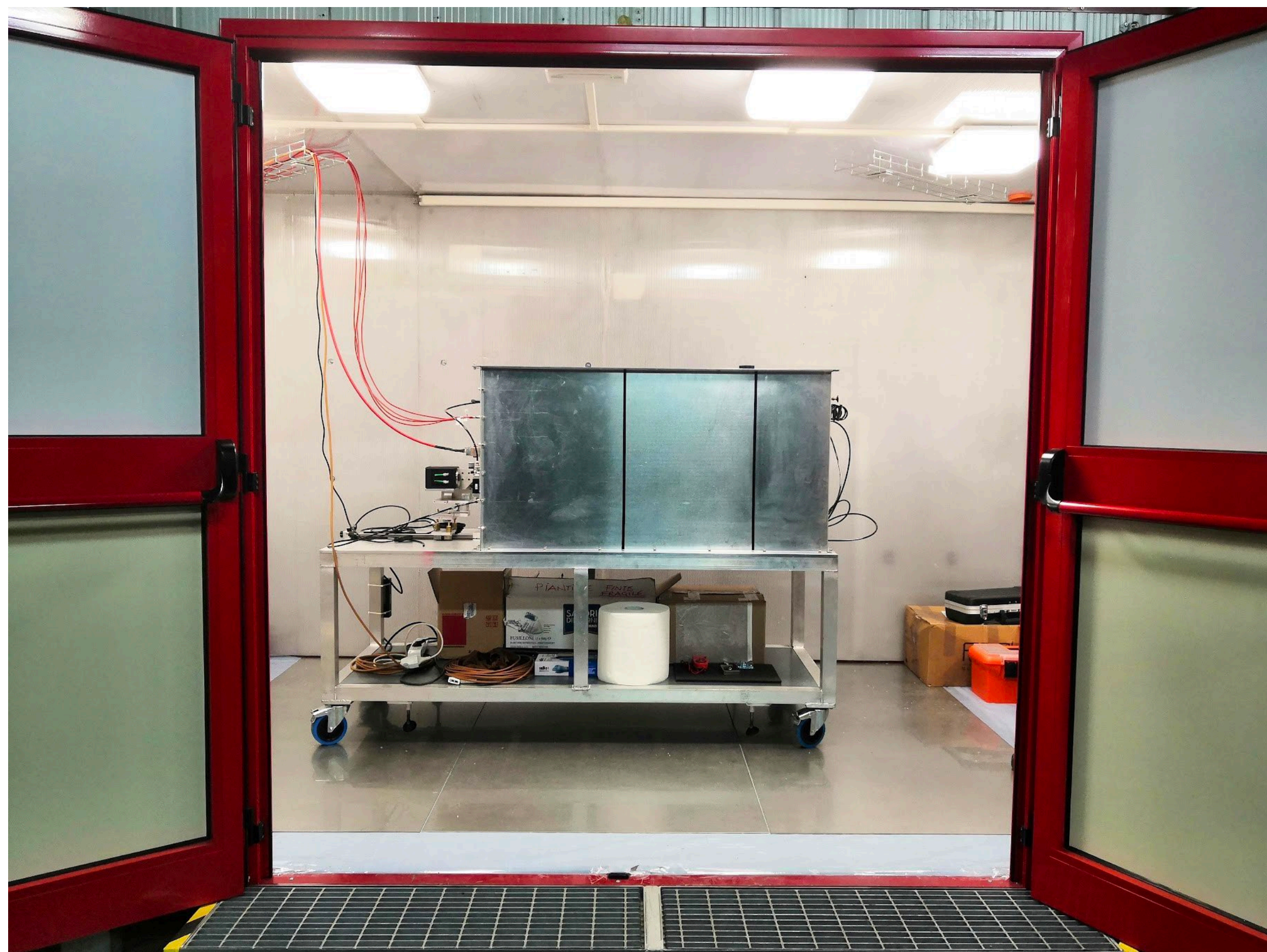
D&C team! and more

most of the of the products I'm going to report today and tomorrow, have been done by the design and construction LNF team, students and fellows in strong collaboration with RM1 and RM3.

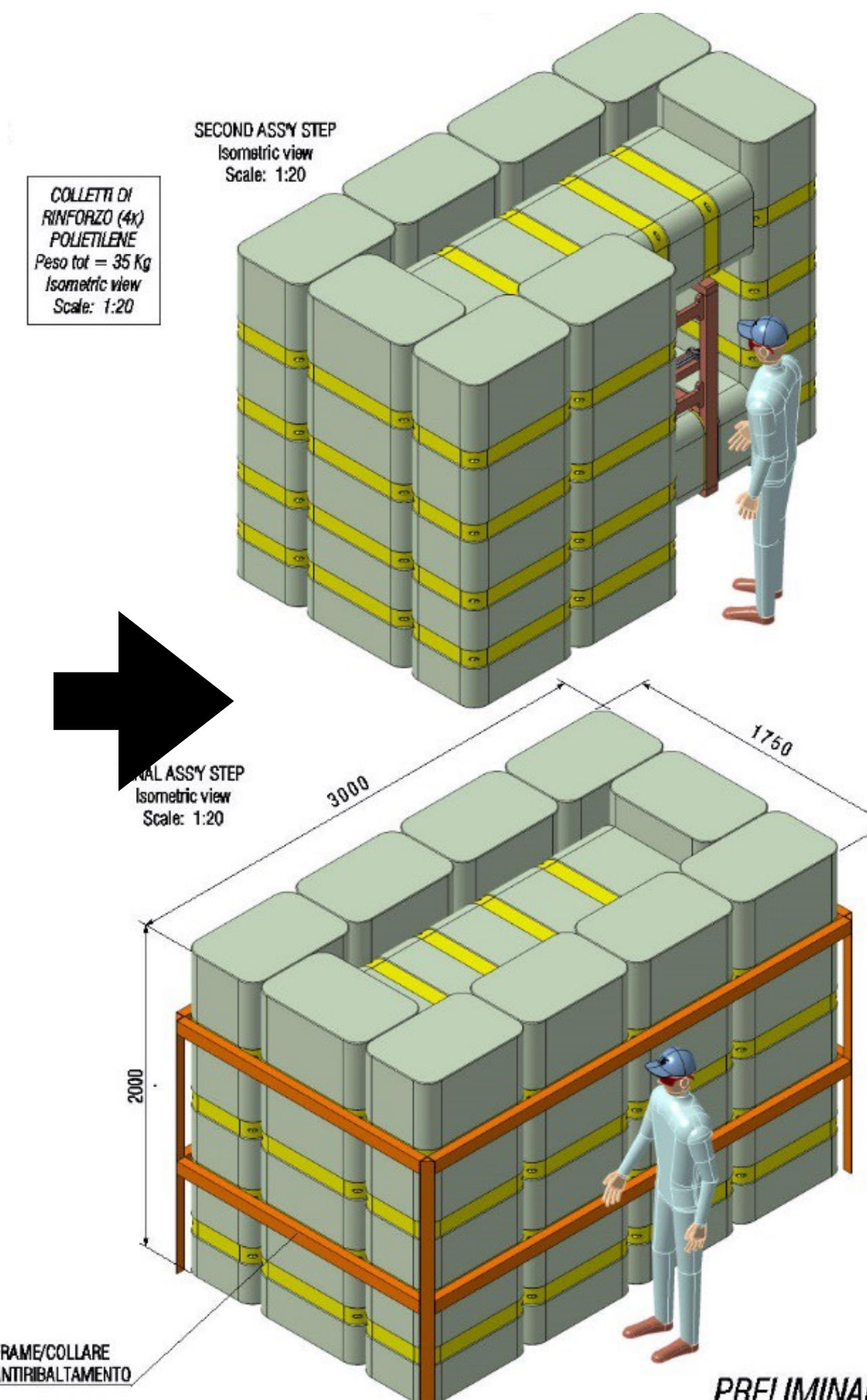
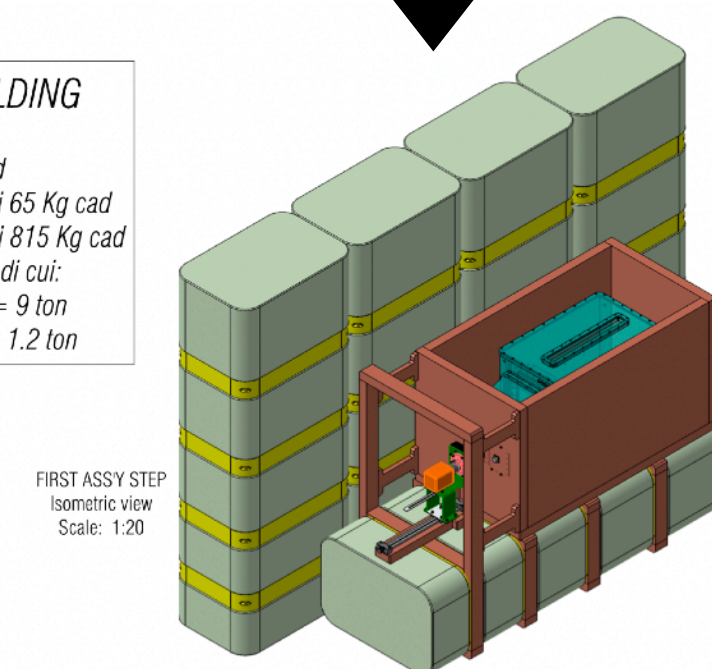
Moreover, we have to particularly thanks Laura Leonzi for her exceptional support to CYGNO project as well as the LNGS services.



LIME —> LIME “detector shielded”



WATER SHIELDING
N.12 Serbatoi
Capacità 750 lt cad
Peso serbatoi vuoti 65 Kg cad
Peso serbatoi pieni 815 Kg cad
Peso totale 10 ton di cui:
- Acqua deminer. = 9 ton
- Polietilene HD = 1.2 ton



- Fascicolo Tecnico (TDR) https://drive.google.com/drive/folders/1B1L_p3kNVEib4WOGtVa8Pb0RiPTjet_y

LIME “detector shielded”

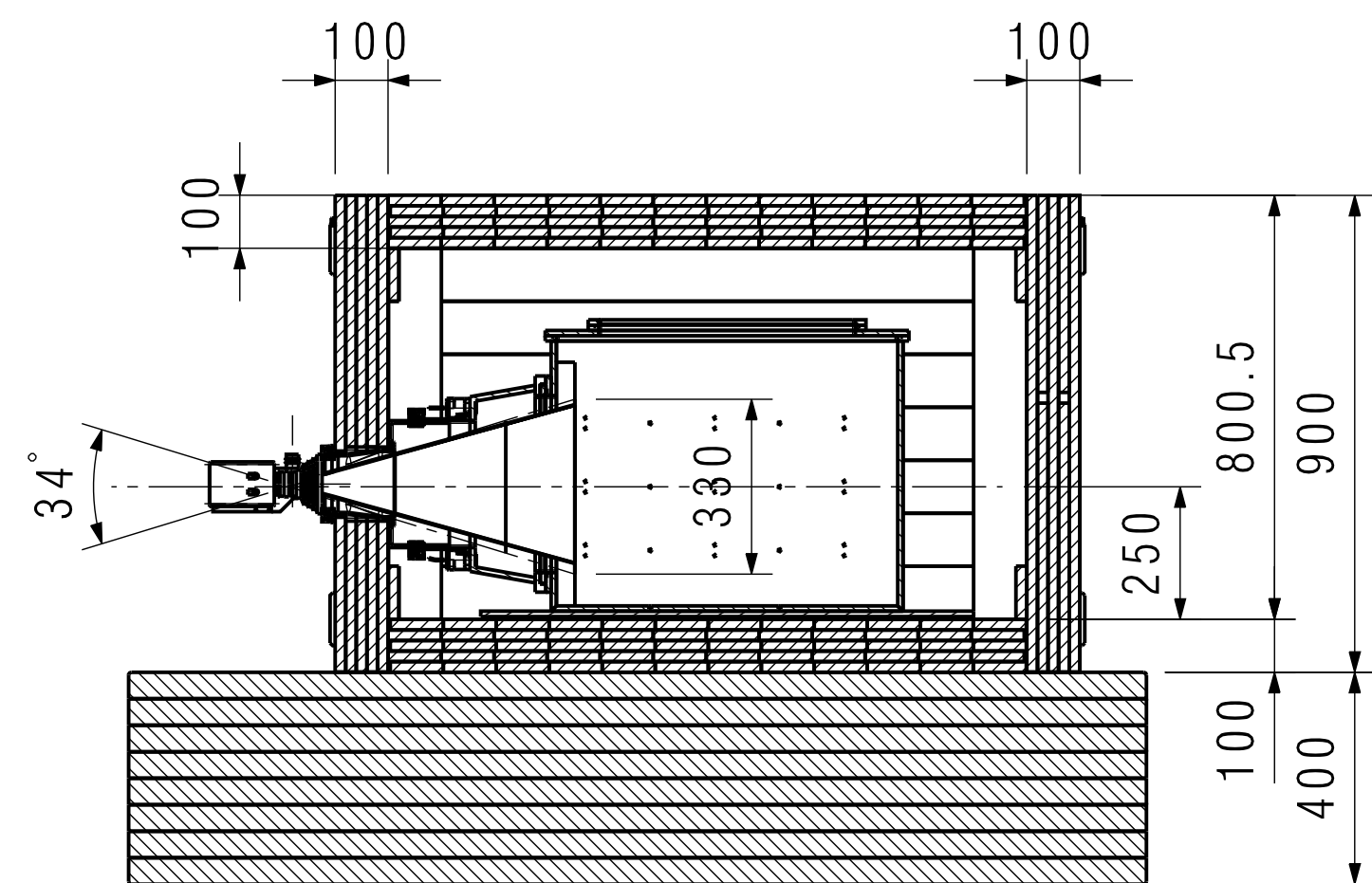
work started in spring 2022

- exploiting the Cu bar of OPERA, not very radio-pure but for free (about 150ke)
- the bars were cuted underground and machined with about 10 different transport, to lower anyway cosmogenic exposition
- in the mean time we purchased all the needs for complete the assembly also with the future water shielding.

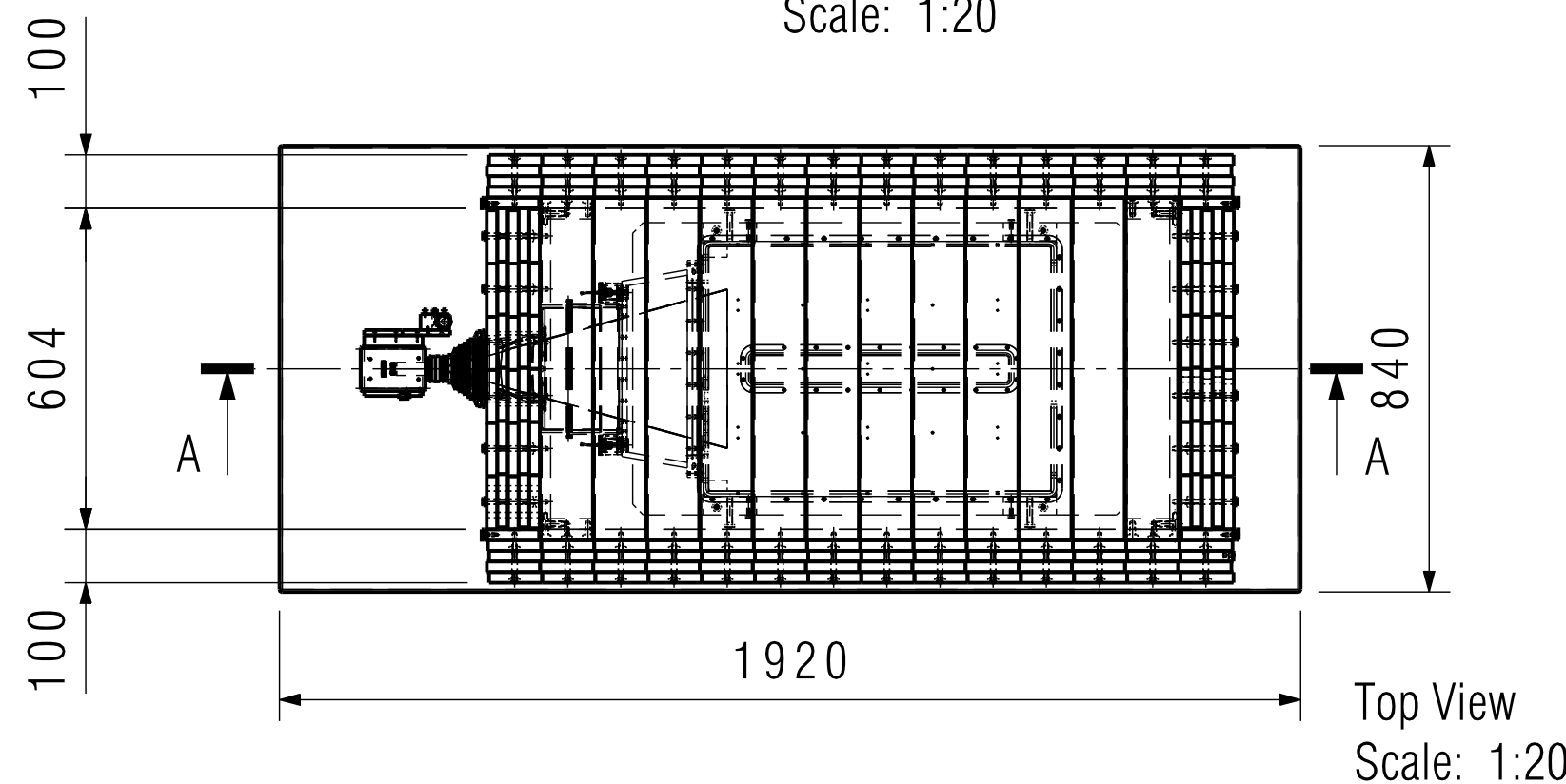


LIME “detector shielded”

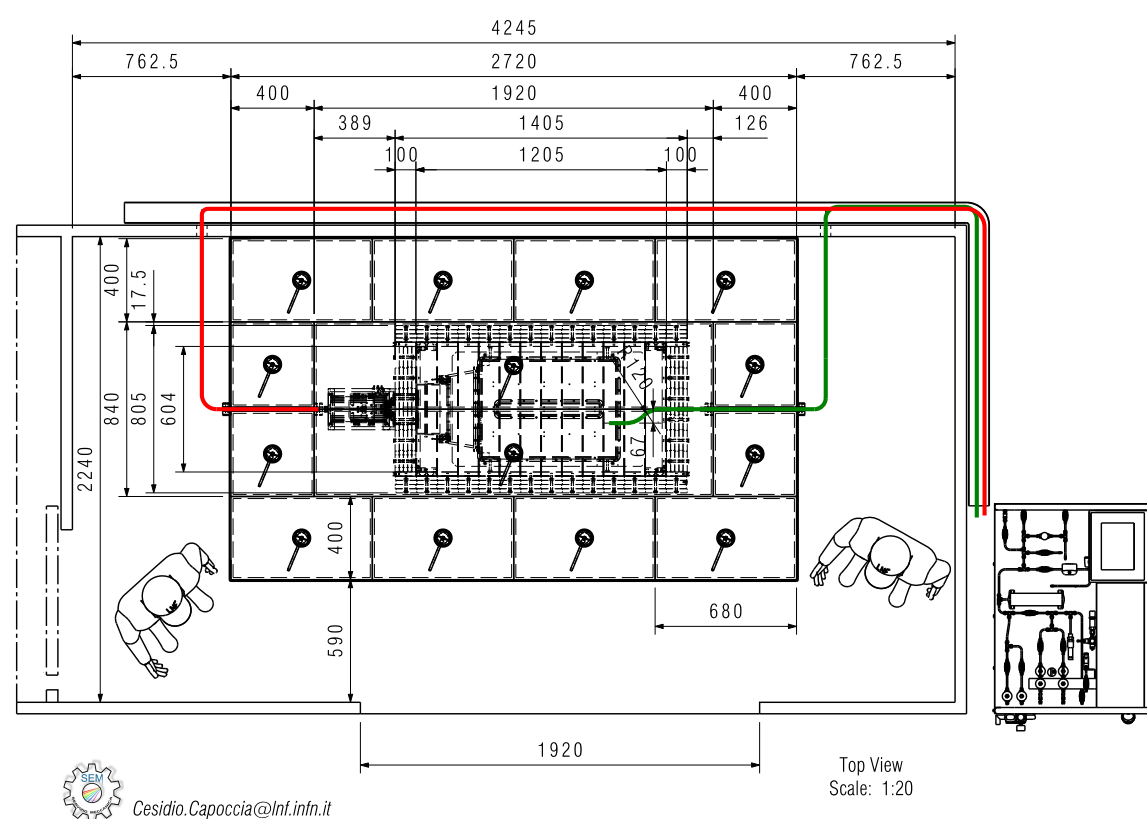
executive layout



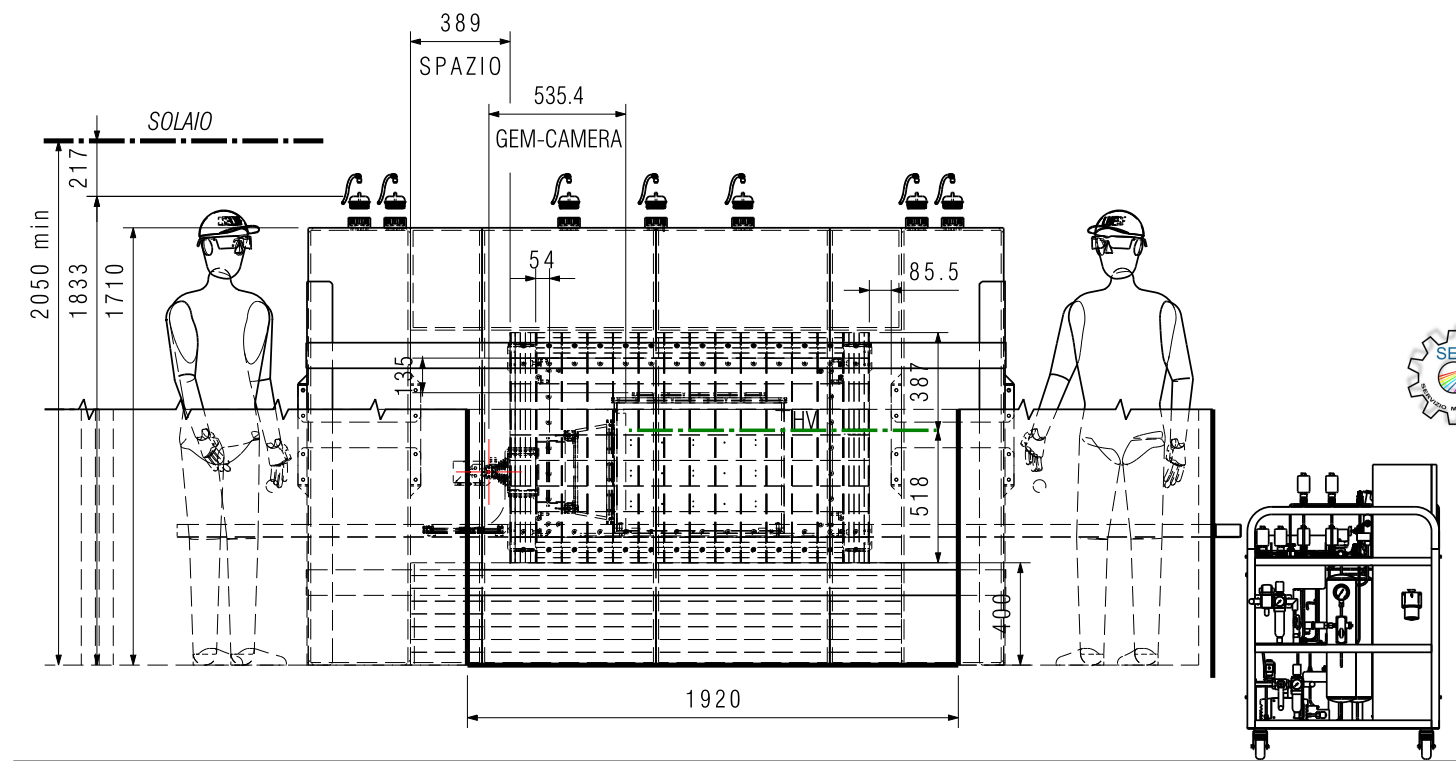
Section view A-A
Scale: 1:20



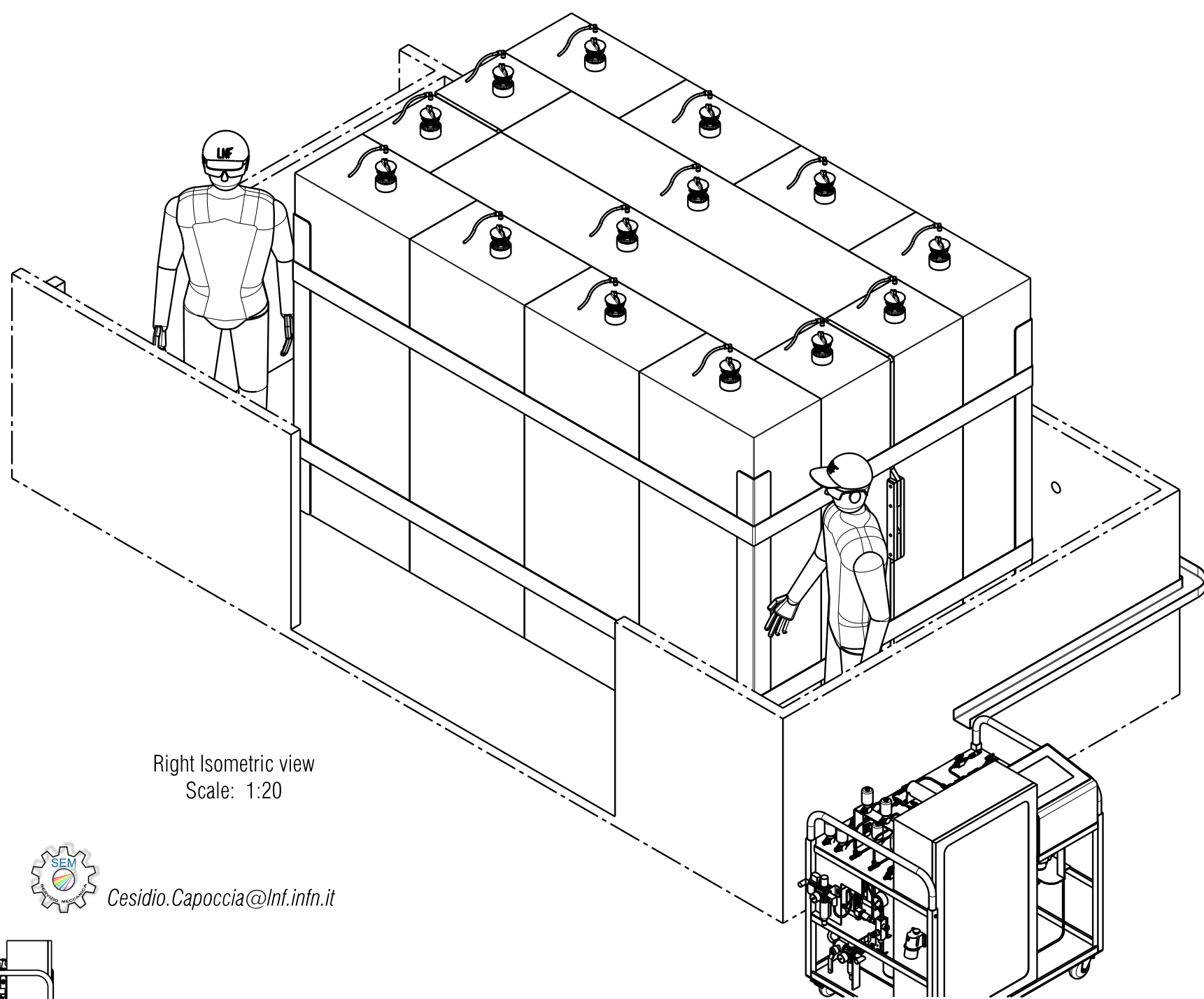
Top View
Scale: 1:20



Top View
Scale: 1:20



Front view
Scale: 1:20



Right Isometric view
Scale: 1:20

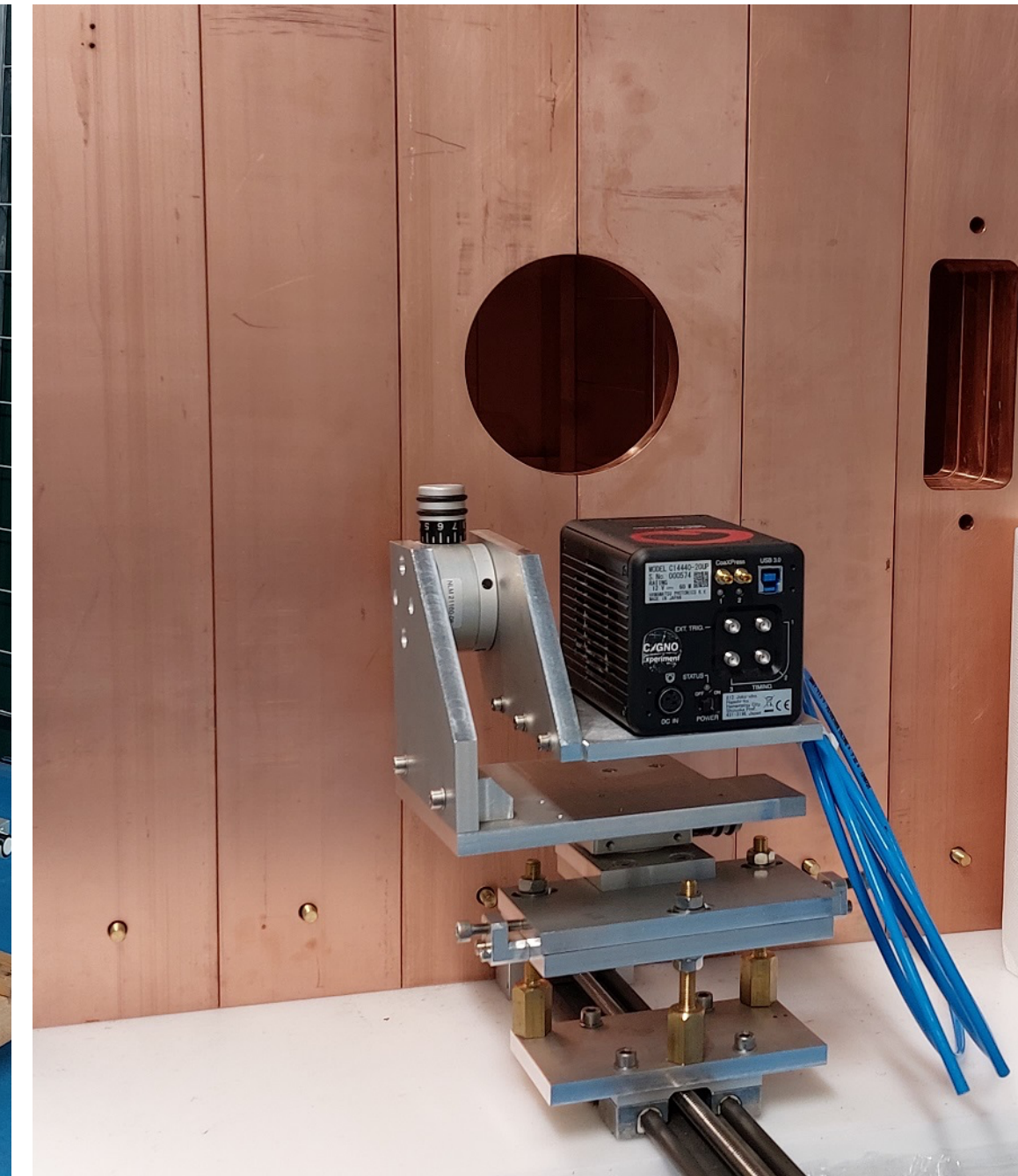
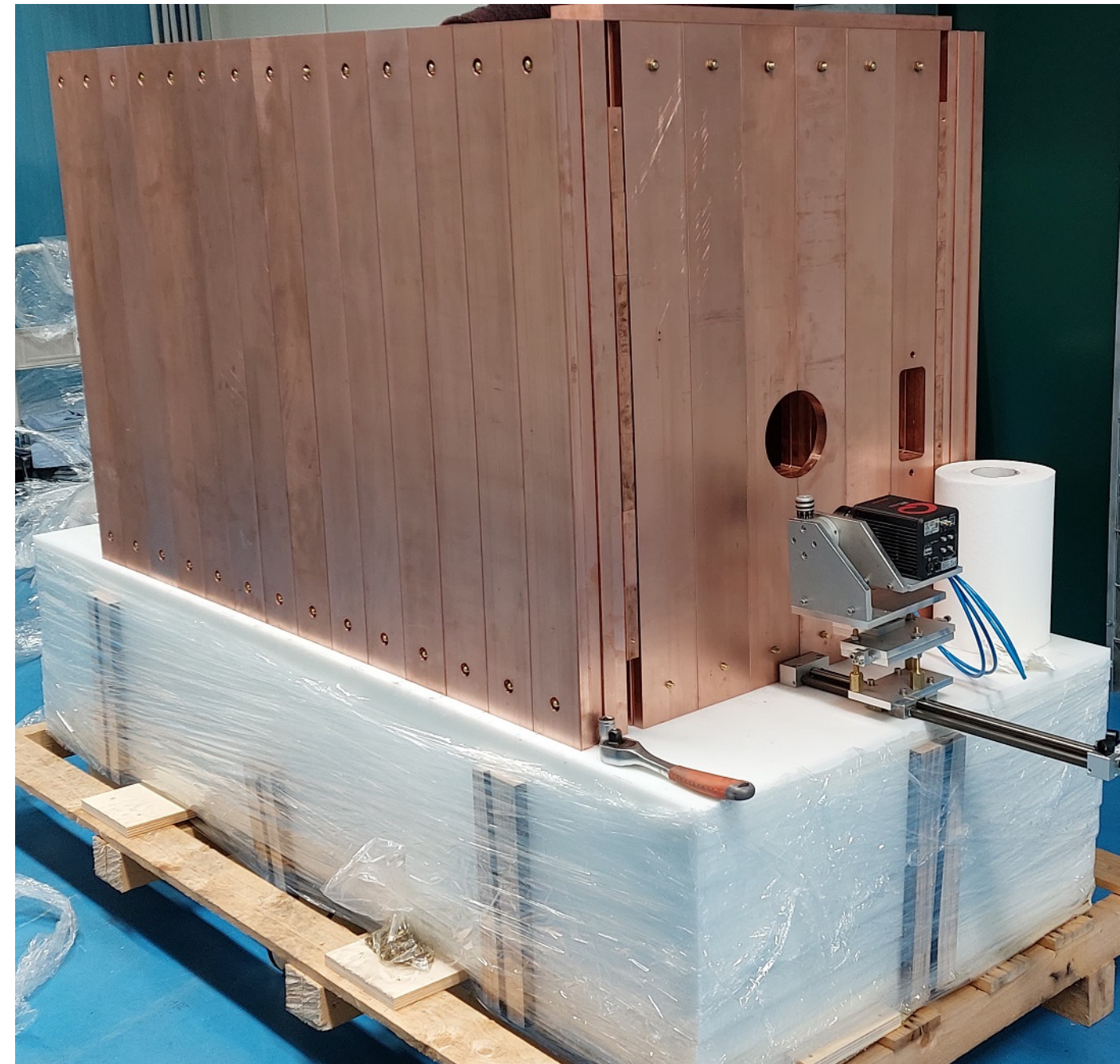
Cesidio.Capoccia@Inf.infn.it

assembly test and work around...



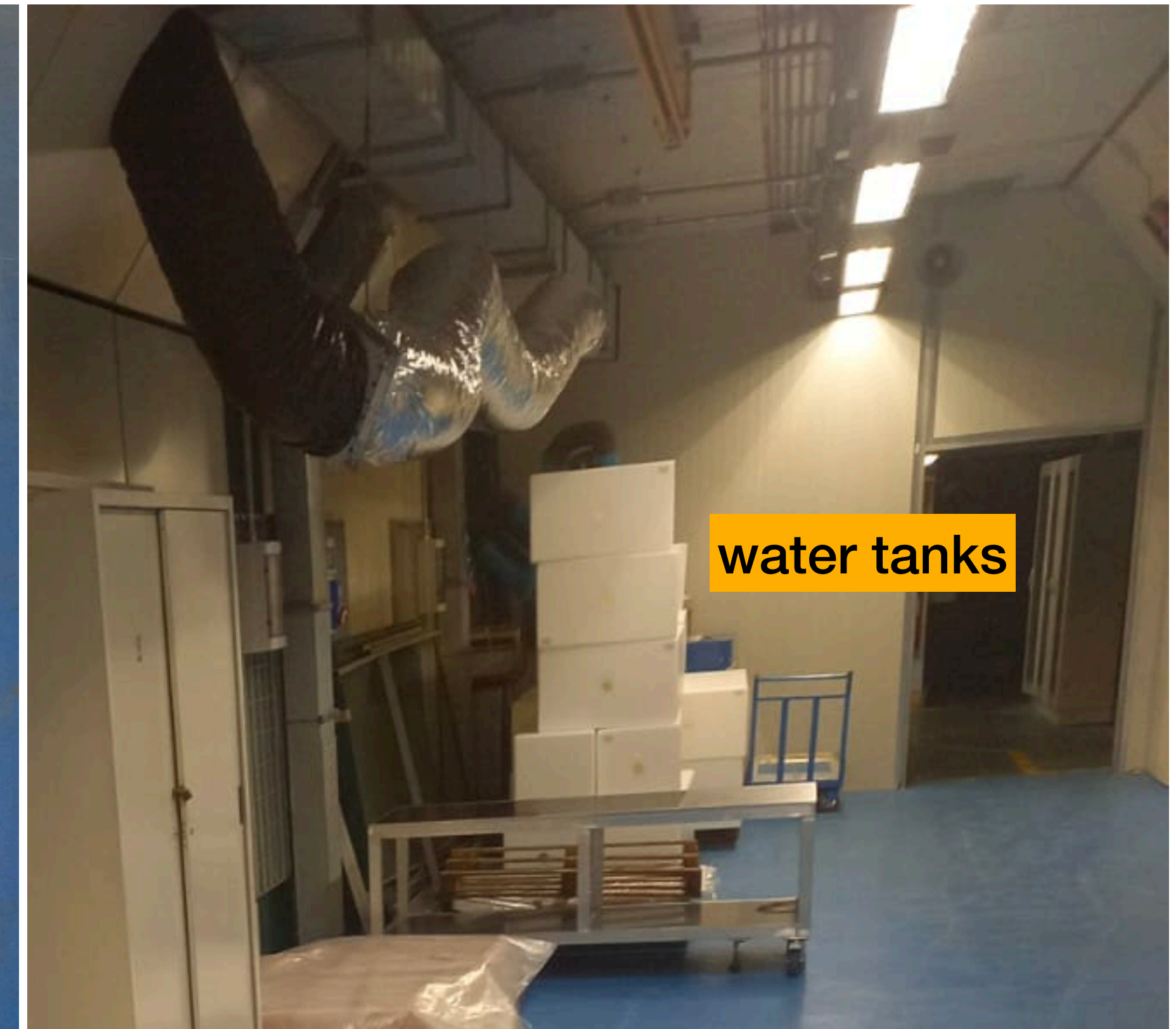
- 7/12 the assembly test was concluded

some details



next step

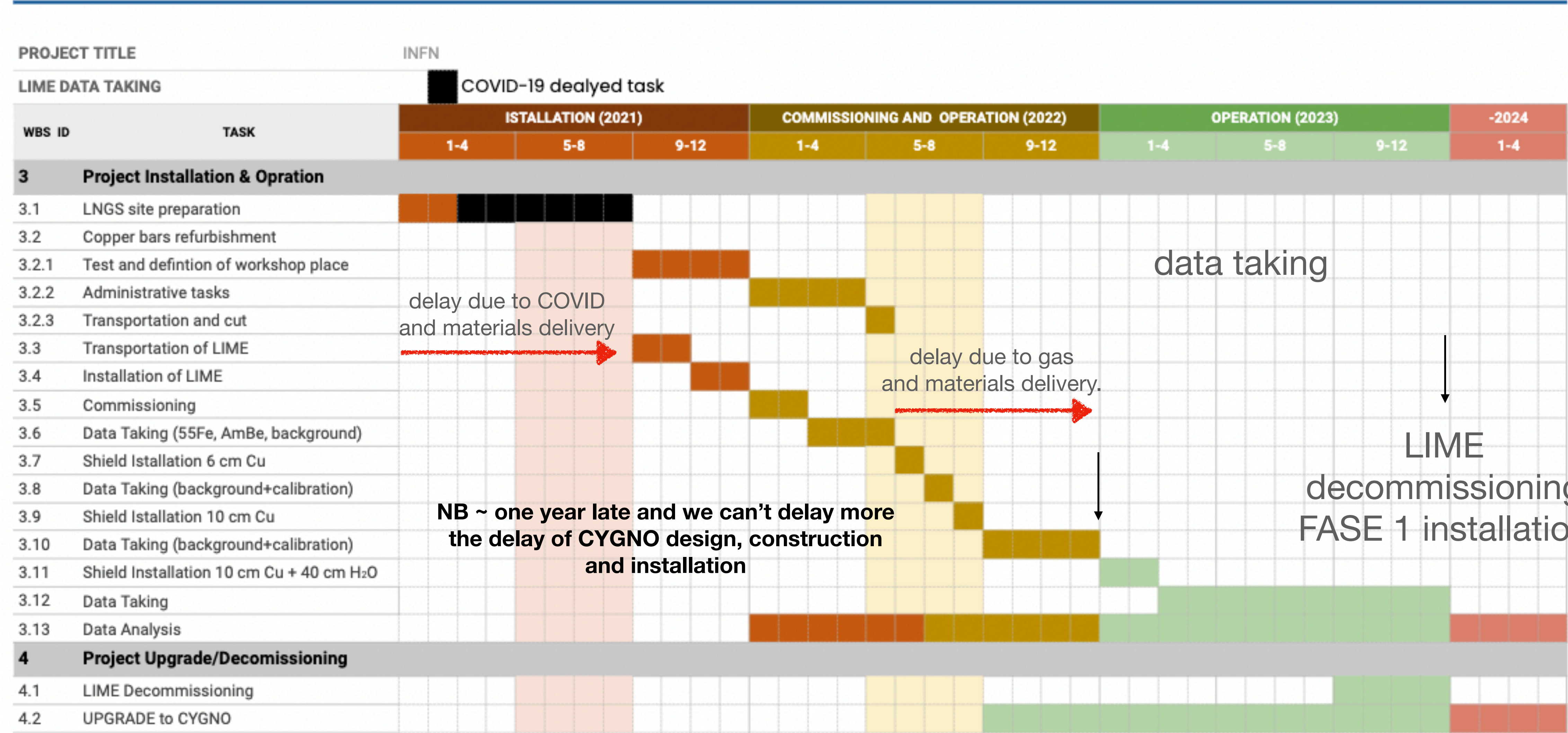
objective: start data taking by the end of January



- 13/12 the Cu shielding structure was dismantled and is ready to be installed the 20/12 in LIME container
- the water tanks were stored in Hall F; we took possession of Hall F, we have also cabinet for tools.

phase 0 - GANTT

LIME



GAS system

il tallone d'Achille (see other talks)

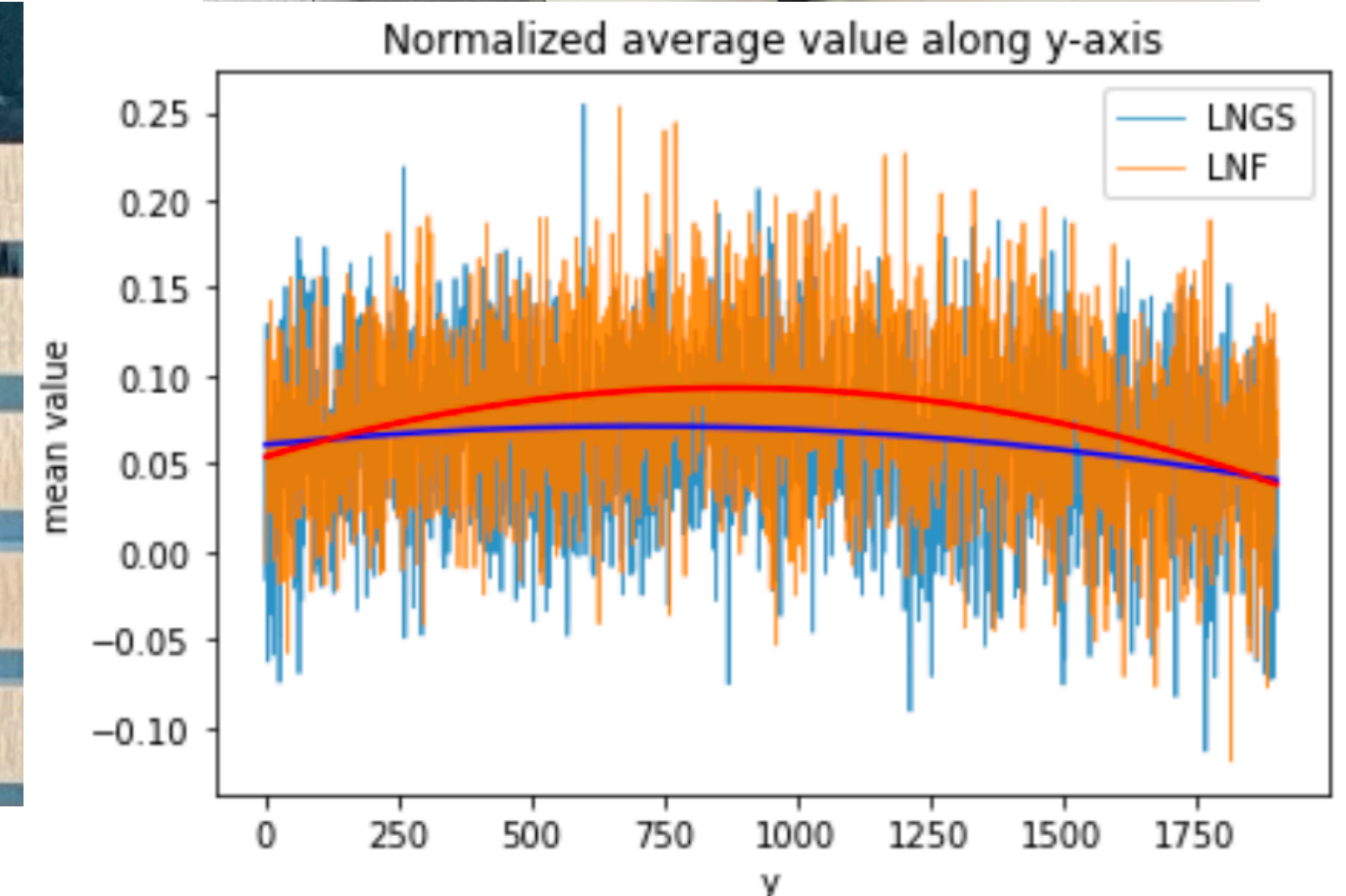
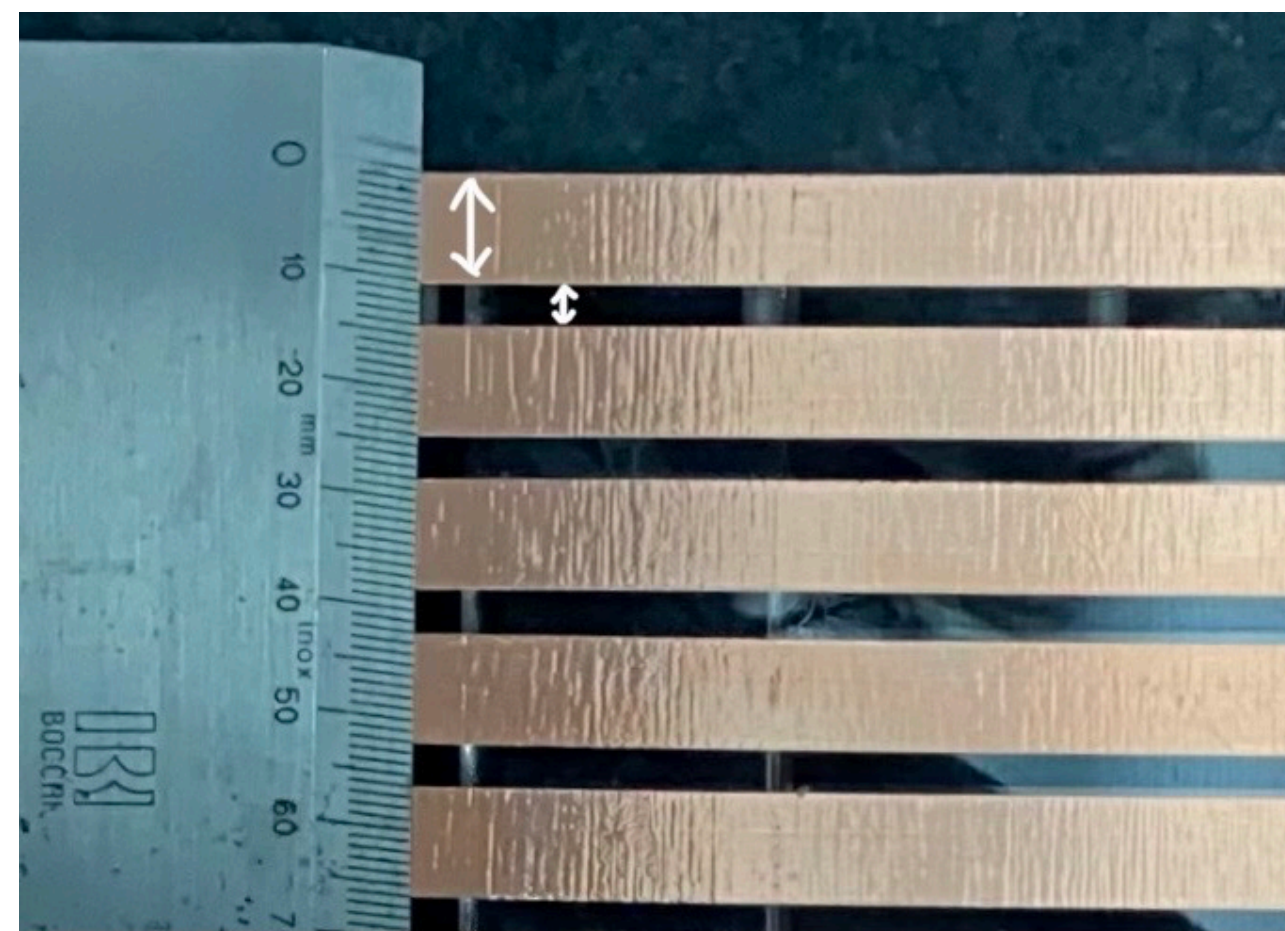
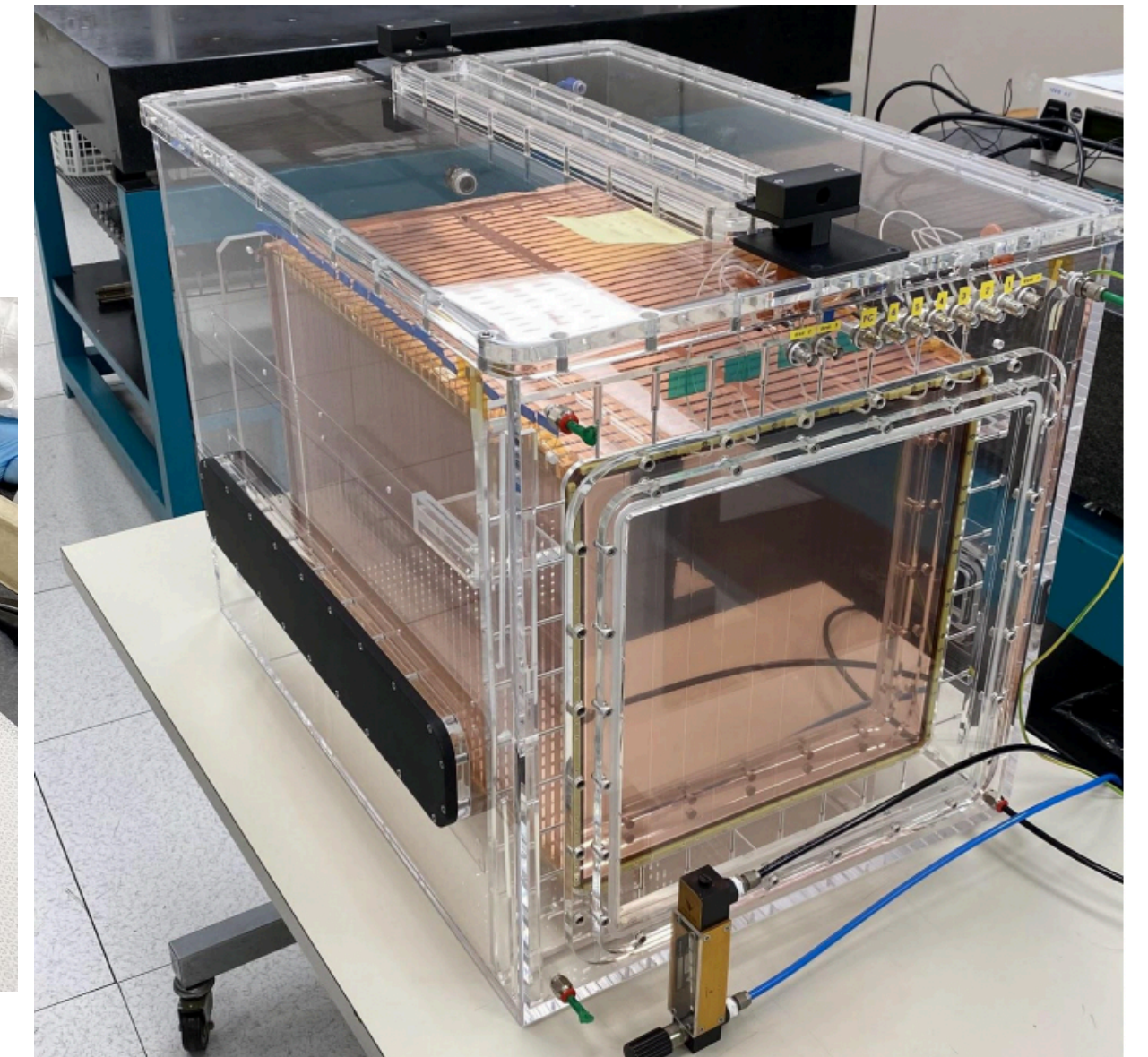
- the GAS system is one of our **single point of failure** and is not completed task.
 - the support of Linde is very poor
 - we didn't have up to now spare parts
 - we still do not have understood humidity and dirty (recycle and purification !?!?)
 - part of the control (not monitor) of the system are “active” and under the DAQ —> very dangerous....
- we have acquired critical spare parts identify up to now and we are refurbishing some part of the line to lower possible humidity input



LIME2 @ LNF

tape test...

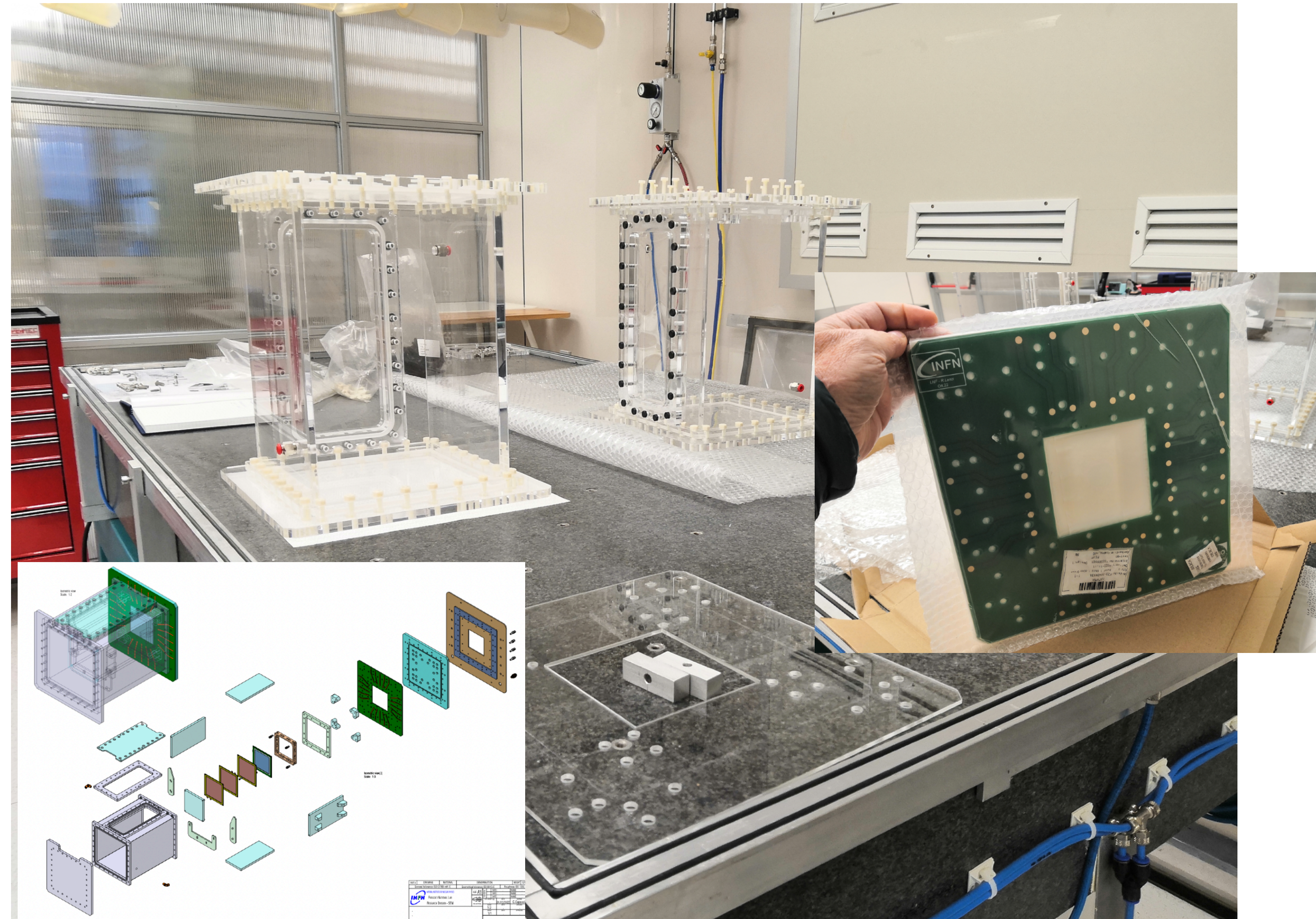
- LIME2 is the copy of LIME at LNGS installed a LNF with a very simple field cage made with tape by PhysLab students and Alex to test DAQ, PMT ecc
- the solution is working and up to now don't show ageing effect
- this allow also to have a spare copy of all the subsystems



GINs

test device for FC and

- vessel, PCB, and FC support ready
- Faraday Cage and 3D printing parts under delivery
- bellows, camera guides and mechanics purchased and on delivering
- FC foil under study, project to be delivered to ELTOS for first prototype
- with lower priority to LIME we hope to assemble it as soon as possible (end of January)



conclusion

on schedule...

- the preparatory phase for the **LIME Cu shielding** installation is going on
- all we need for a **preliminary** but operative **setup** is available (cone, bellows, guides, ecc); running update are foreseen with limited time impact
- 20-21/12 we foreseen the **transportation and pre-installation** of the shielding in order to check and identify unexpected issues and be **ready for January** to complete as soon as possible the setup
- **LIME2** is fully operative as LIME mirror at LNF to DAQ ecc.
- **GINs** are under assembly at LNF and will be soon ready to be a new tool to investigate materials and to provide detectors for our Brazilian team

conclusion

critical items

- the spare subsystems @ LNF for **LIME2** are not the copy one2one to the LNGS
 - some difference in **hardware** or missing parts
 - some **mismatch** on the DAQ system (MIDAS/Software)

this is important not only for the **development** but also for the **reliability** of the LNGS where DAQ is a single point of failure (the other is the GAS system)

- The **GIN** setup is fundamental for some of the CYGNO04 milestone (cathode, FC, see tomorrow), the effort on that are not critical
- **LIME**: the installation of shielded is going on as well as refurbishing of gas system and still a lots of efforts are required on that mainly for design; the delay accumulated it's **strongly interfering** with CYGN04 (see tomorrow)