

# M1 pTP Report and test proposal

R. de Aguiar, E. Segreto, A. Mendonça.

# Previously...

- **Module C1:** only one filter on the covered frame had a small damage in one of its corners.
- **Module C2:** Just two filters from the exposed frame were in a good condition and the filters from the hidden side were all good.

Module	Covered Frame			Exposed Frame		
	ZAOT	PE	STATUS	ZAOT	PE	STATUS
C1	16	0	All in Good Condition	16*	0	All in Good Condition
C2	16	0	All in Good Condition	2	14	14 filters in Bad Condition
C3**	0	16	13 in Bad Condition	0	16	All in Bad Condition
C4**	0	16	13 in Bad Condition	0	16	13 in Bad Condition

\* Considering the change on the master table

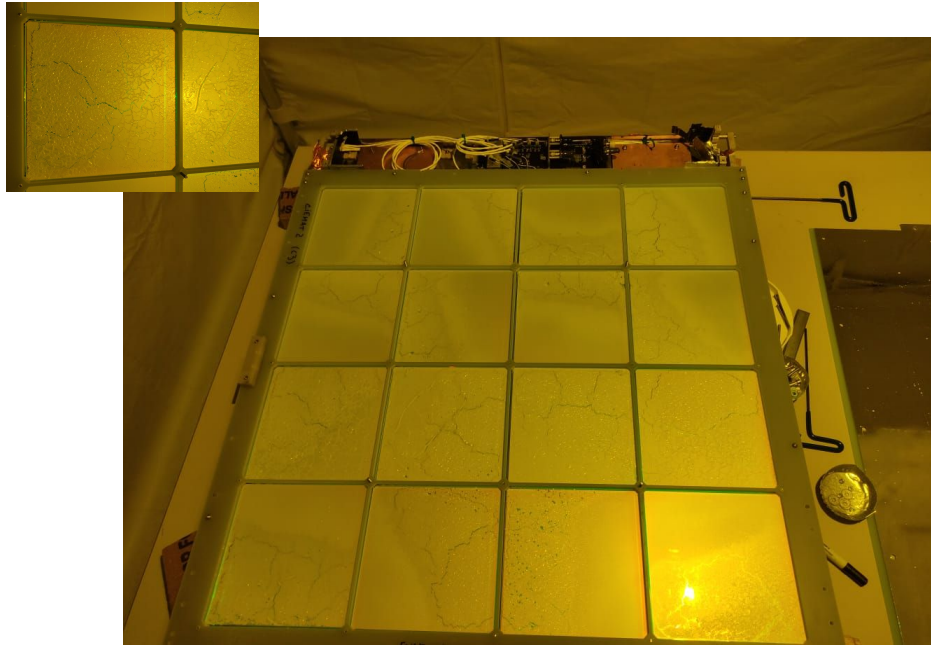
\*\* Conditions from the previous cold box, the modules were not remove from the cathode yet.

## Now:

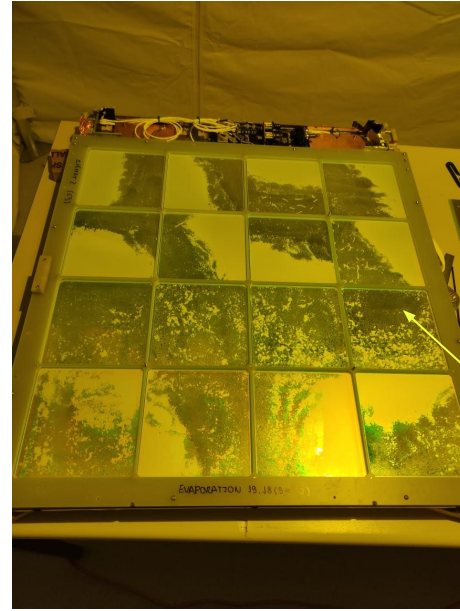
- All the cathode modules (from the cold box) were removed and placed on the VD room;
- They were opened and the pTP and dust that was spread on the frames, WLS and filters were carefully removed with a vacuum cleaner by L. Paulucci and R. de Aguiar;
- The damaged filters from C2 were removed and stored in a box, the damaged filters from C3 and C4 were kept on the modules frame, we still need some confirmation about what to do with them.

# Module C3:

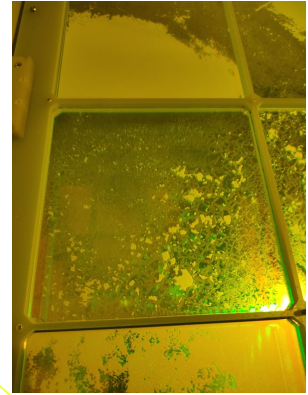
- Covered frame: Modules from PE's December Batch: **All damaged!**



Before cleaning



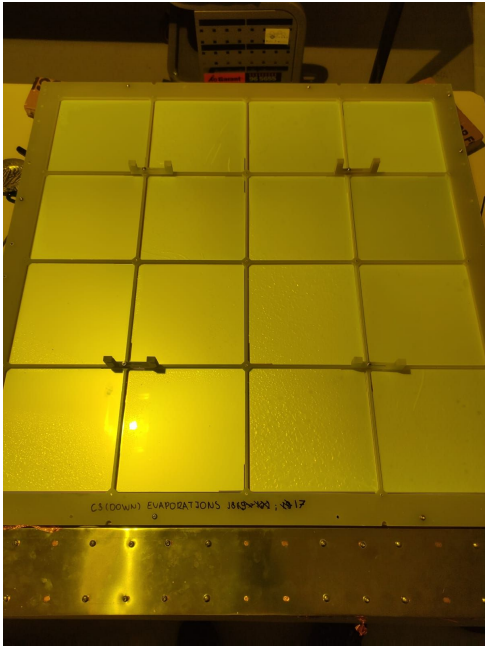
After cleaning



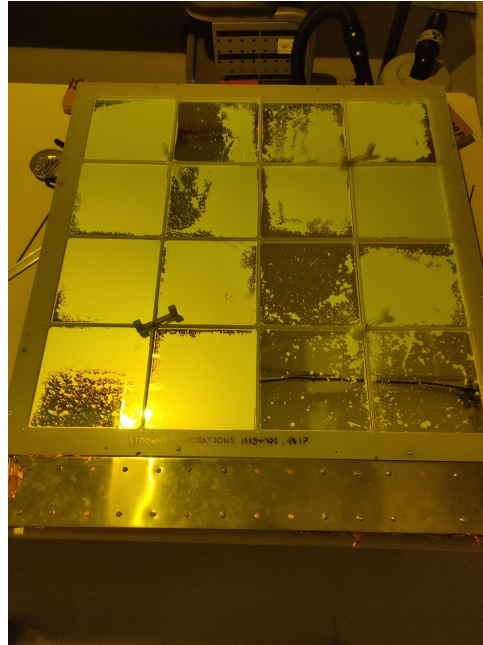
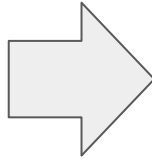
Pattern?

# Module C3:

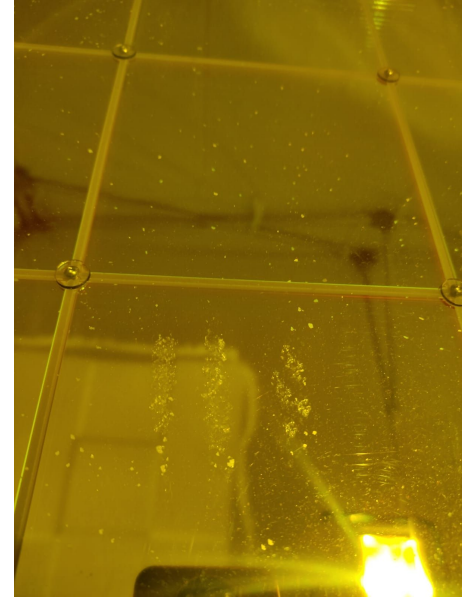
- Exposed frame: Modules from M7 & M8 : **All damaged!**



Before cleaning

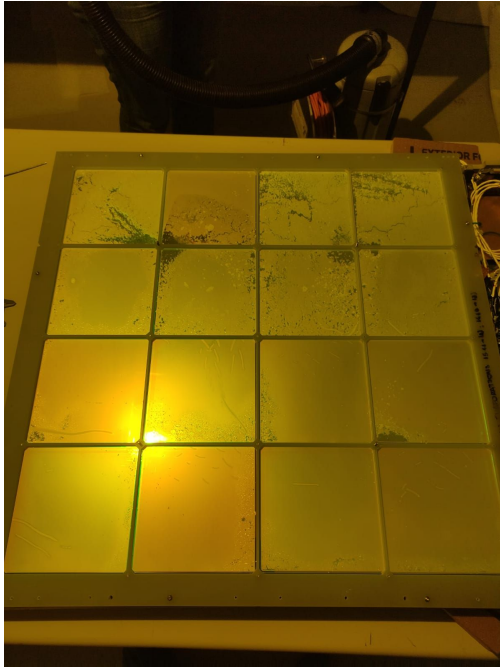


After cleaning

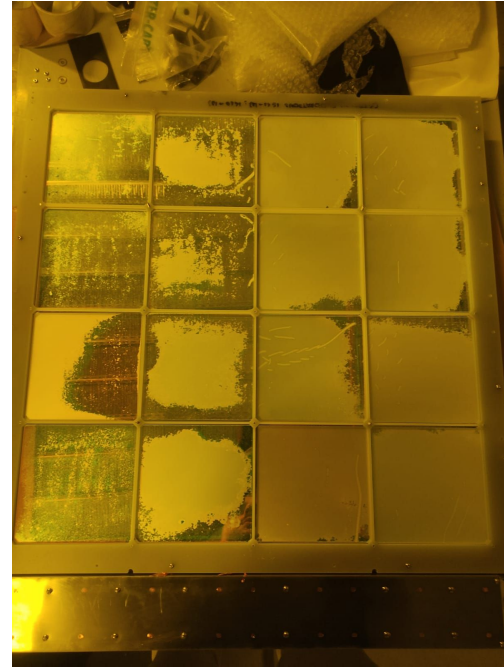
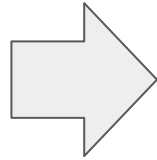


# Module C4

- Covered frame: Modules from PE's December Batch: **All damaged!**



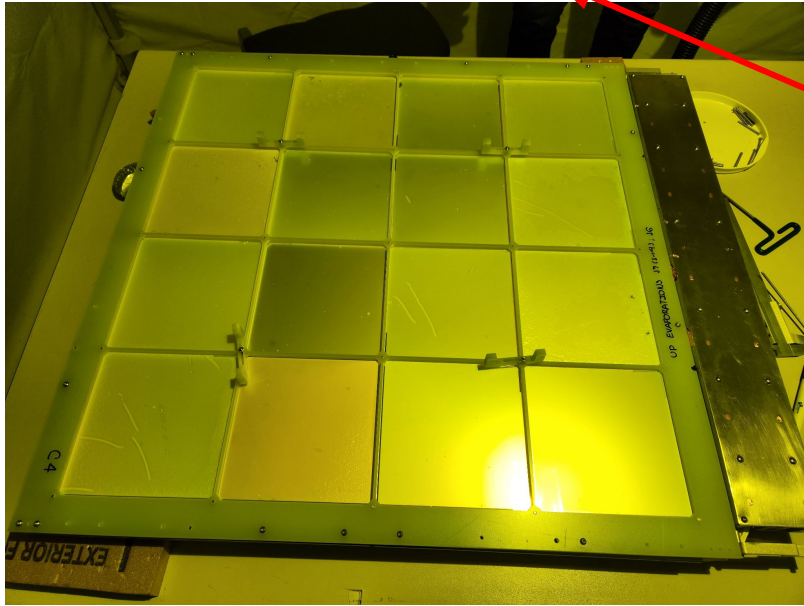
Before cleaning



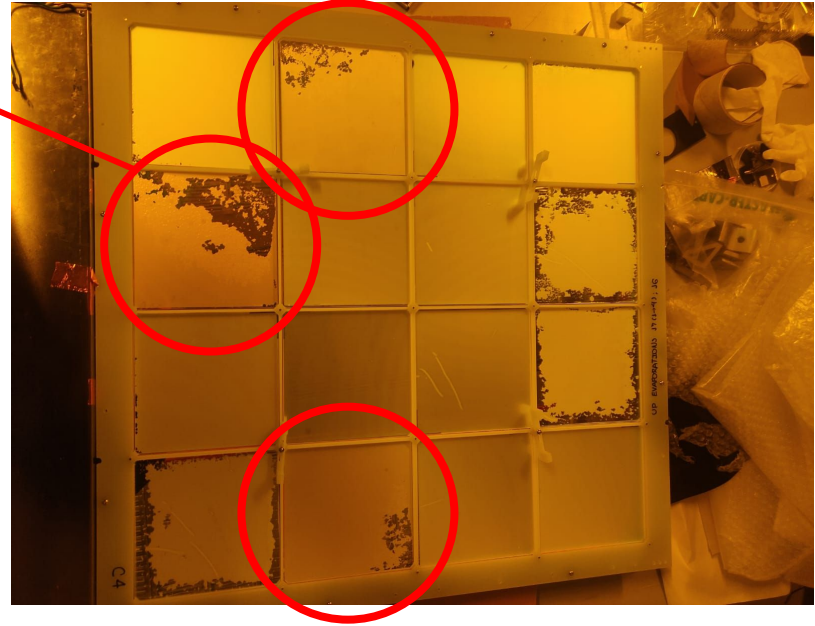
After cleaning

# Module C4

- Exposed frame: 3 from PE's December Batch and 13 from M7 & M8 (6 out of 13 were damaged)



Before cleaning



After cleaning



# Membrane Modules:

Filters from ZAOT: **all good!**





# Proposal for an adhesion test

- Why the some filters have bad adhesion? It is because the substrate? The temperature gradient? Other filters that were installed on NP02 have the same problem?
- To assure that the pTP won't detach from another filters during the NP02 operation, on the next weeks, we can test their adhesion on the test stand since we will have LAr available;
- In principle, the idea is to test the spare filters from M5 and M6, but we can test any filter that wasn't emerged on LAr before;
- **Cautious**: ice formation and water condensation!

# Proposal for an adhesion test

Proposed procedure:

- We take a frame from one of the modules on the VD room and installed some filters, avoiding the bottom row;
- Install the frame on the test stand set up;
- We place the frame on the top of the dewar, then, we cover with the plastic and purge nitrogen to remove the atmospheric air and reduce the chance of ice formation;
- We place the frame inside the cryostat and start to purge LAr slowly (we can monitor the temperature gradient with the DCS);
- Once that the filters are submerged, we close the LAr and leave it until the next day;
- Since the this dewar doesn't have a very adiabatic, most of the LAr will evaporate and the slow temperature gradient will prevent water condensation.



# Proposal for an adhesion test

- This controlled test can give answers if the filters survive on LAr environment, and if the cause of the the pTP detachment on the cold box was because of the LAr contact or something else;
- We can also try a stress test where we submerge a spare filter directly on LAr (high temperature gradient) to verify if the temperature variation has some effect on the adhesion.

# Conclusion

- All filters from PE showed adhesion problems during the cold boxes run;
- Filters from M7&M8 also showed poor adhesion, maybe filters from M5&M6 have the same issue;
- ZAOT filters installed on the cold box's membrane survive both runs;
- It was presented an idea of a test to check the potentially problematic filters