

Dichroic filters for M1

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Overview

- Module-1 will have 4 cathode and 2 membrane modules. That implies $32 \times 4 + 16 \times 2 = \mathbf{160}$ **dichroic filters** with size 143.75×143.75 mm²
- This will be shared in equal amounts between PhotonExport (PE) and ZAOT
- The thickness will be ~ 1 mm for both (PE used 1.5 mm for M0)
- A new optimisation beyond Module-0 has been carried out based on the results of the PCE optimisation with a detailed MC simulation by Julio Ureña (previous talk)
- The optimal cutoff in LAr is ~ 475 nm instead of 400 nm

ZAOT production

- 85 filters with new optimisation were formally ordered on October 13th
- Target date for being at CERN (at least half of them) after PTP coating was November 15th

October

M	T	W	T	F	S	S
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

November

M	T	W	T	F	S	S
30	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

Production
Shipment

Shipment to CERN

PTP coating UNICAMP holidays

First batch of 50 filters

- A first batch of 50 filters was directly sent to UNICAMP on October 20th
- Filters collected by Ana on October 25th
- PTP coating could have started on November 26th

October

M	T	W	T	F	S	S
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

November

M	T	W	T	F	S	S
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3
4	5	6	7	8	9	10

Production
Shipment

First batch of 50 filters

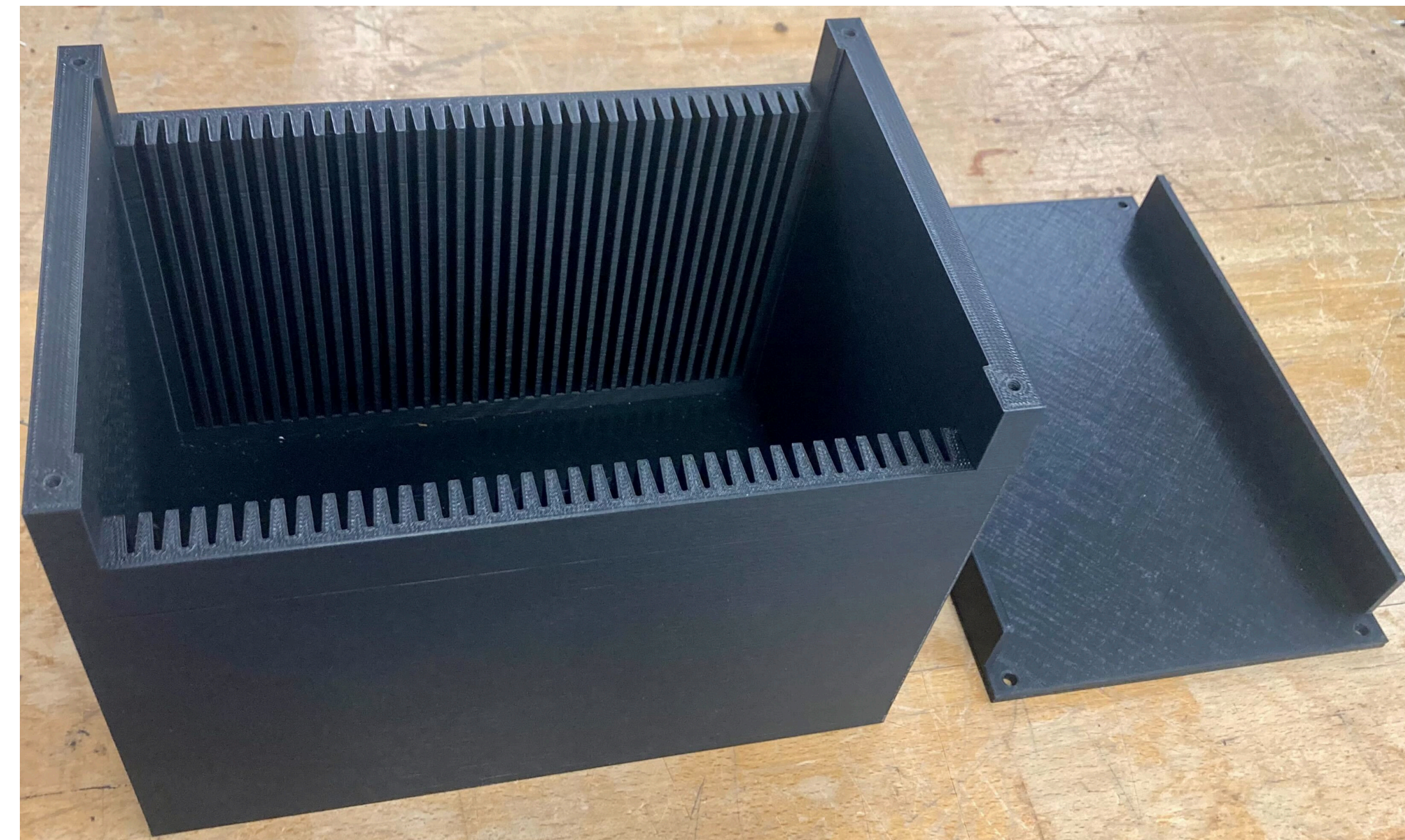
- Two boxes sent from CERN to UNICAMP on October 19th
 - Have not yet arrived !!!!
 - The problem is with customs and is related with the value of 100 euros that was declared. 99 \$ would have worked OK
- Coating cannot start because filters need to be stored in boxes after coating
- We have lost now 15 days because of the boxes
- Obviously we need a solution for the future. We need to send lots of boxes to Campinas well in advance

Solution for first batch of ZAOT filters

- Filters will not be at CERN in time for first run (Nov 21st ?)
 - Not dramatic, this was intended to be mainly an electronic test
- Then, when do we want the filters at CERN ? Is sufficient to have them before Christmas ?
 - If so, the ZAOT batch (next slides) will make it, and even the PE batch.
- In any case we should solve the problem with the boxes in transit

Second batch of 35 filters

- Second batch of filters received at IFIC on November 6th
- We have produced 5 new boxes (35x5 = 175 slots)
- Filters and boxes have been sent today
- We should count three weeks to have the filters at CERN (Dec 1st)



Photon Export production

- Formally ordered on October 15th
- 100 filters (20 for PCE measurements)
- + 20 substrates for tests with pTP only

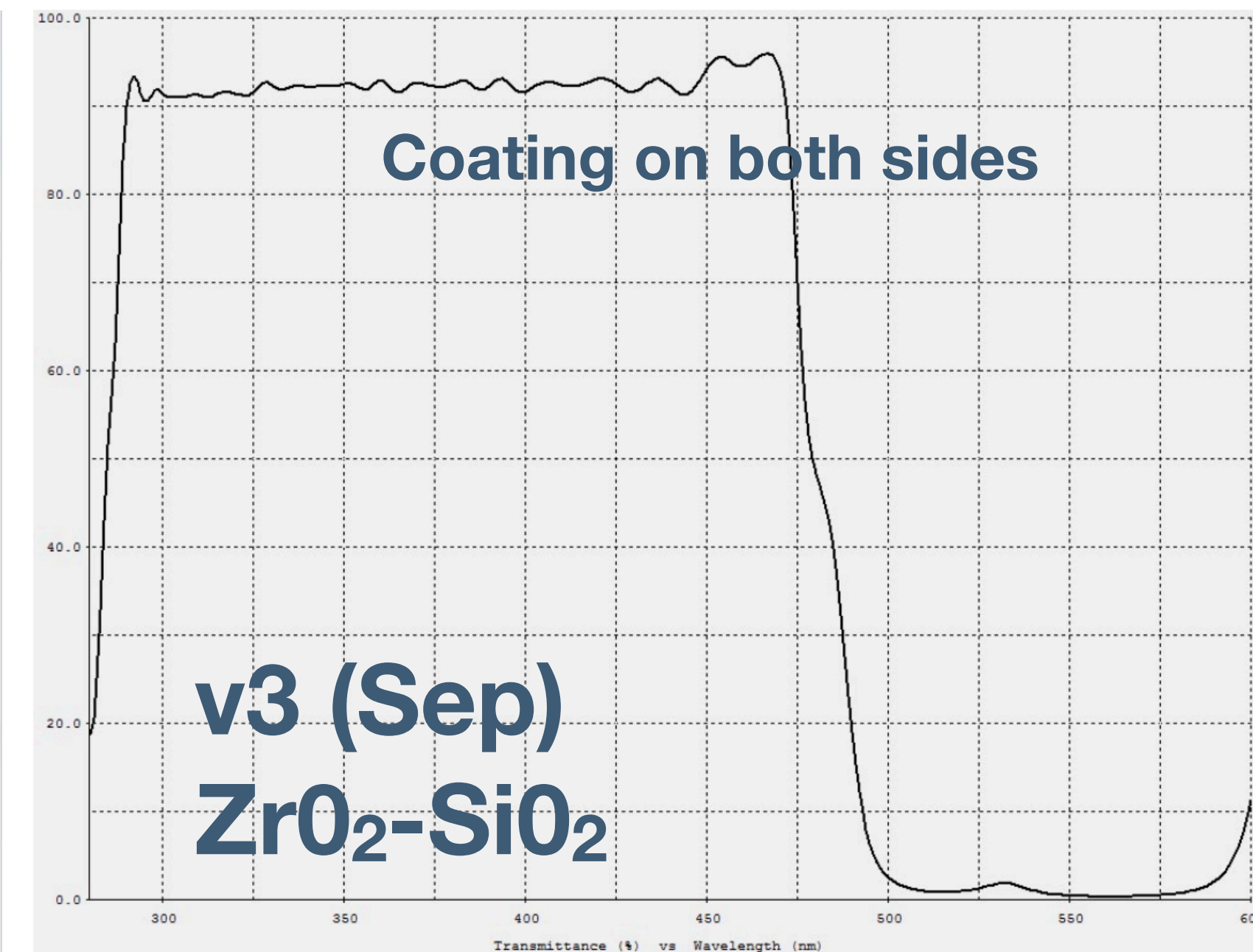
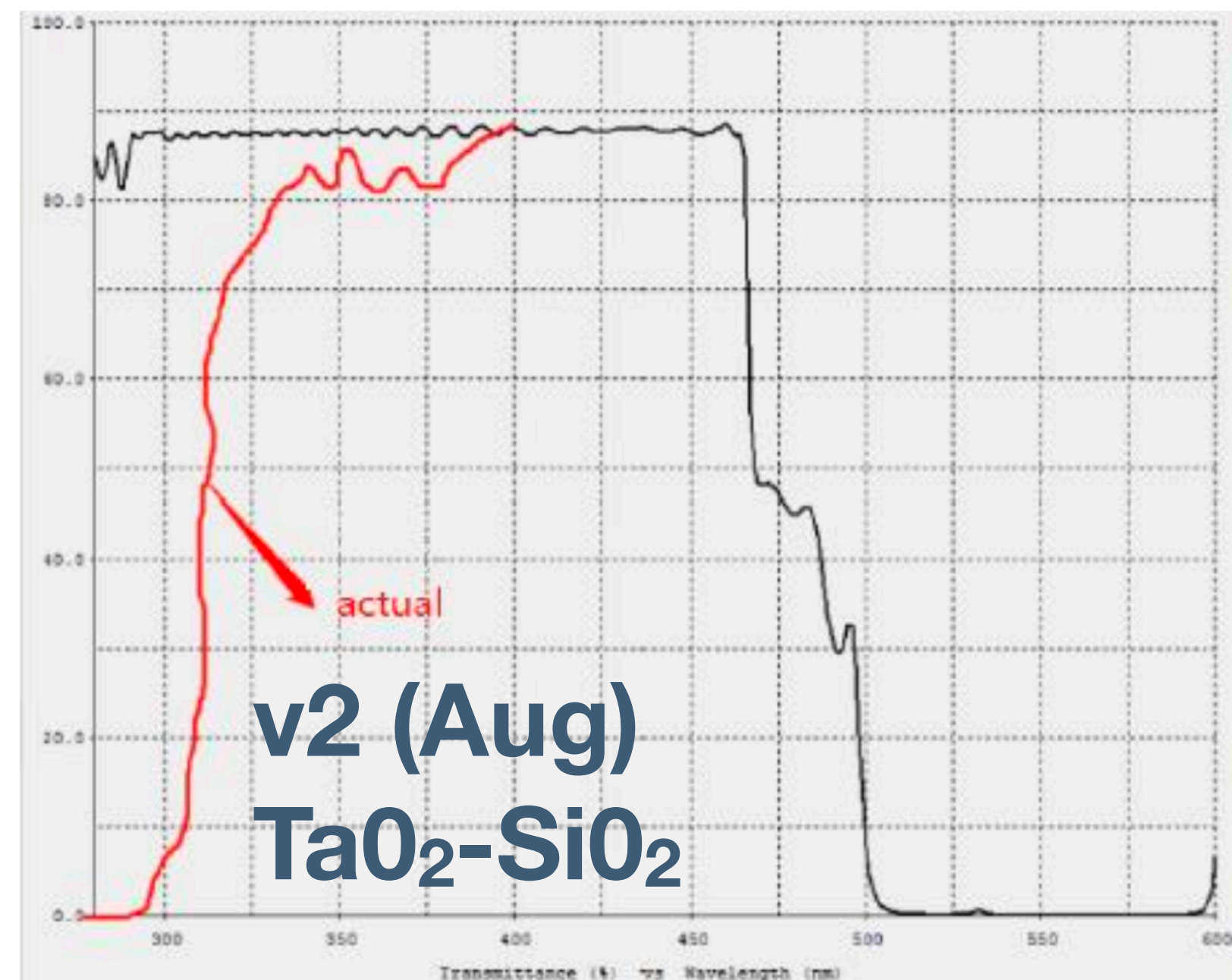
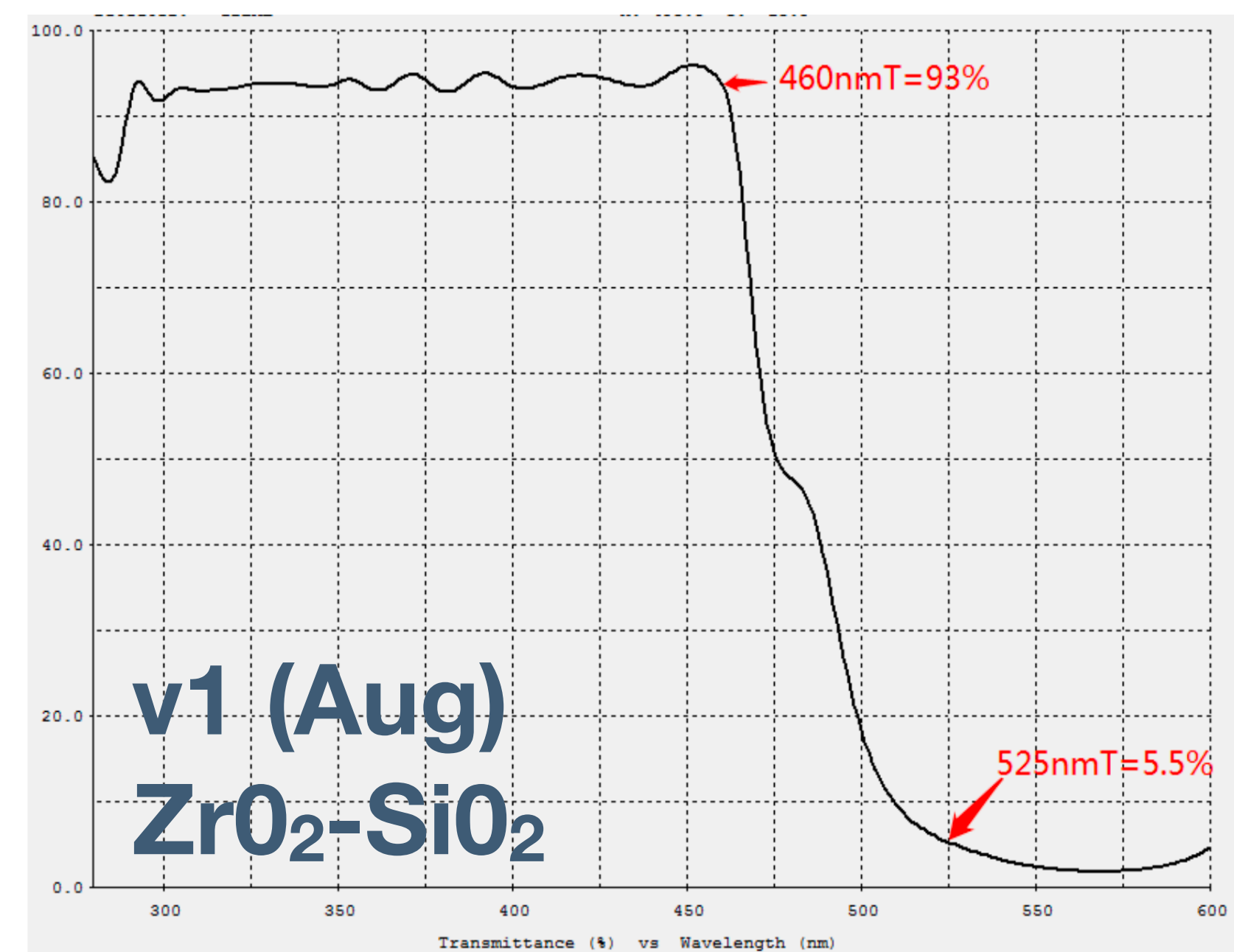
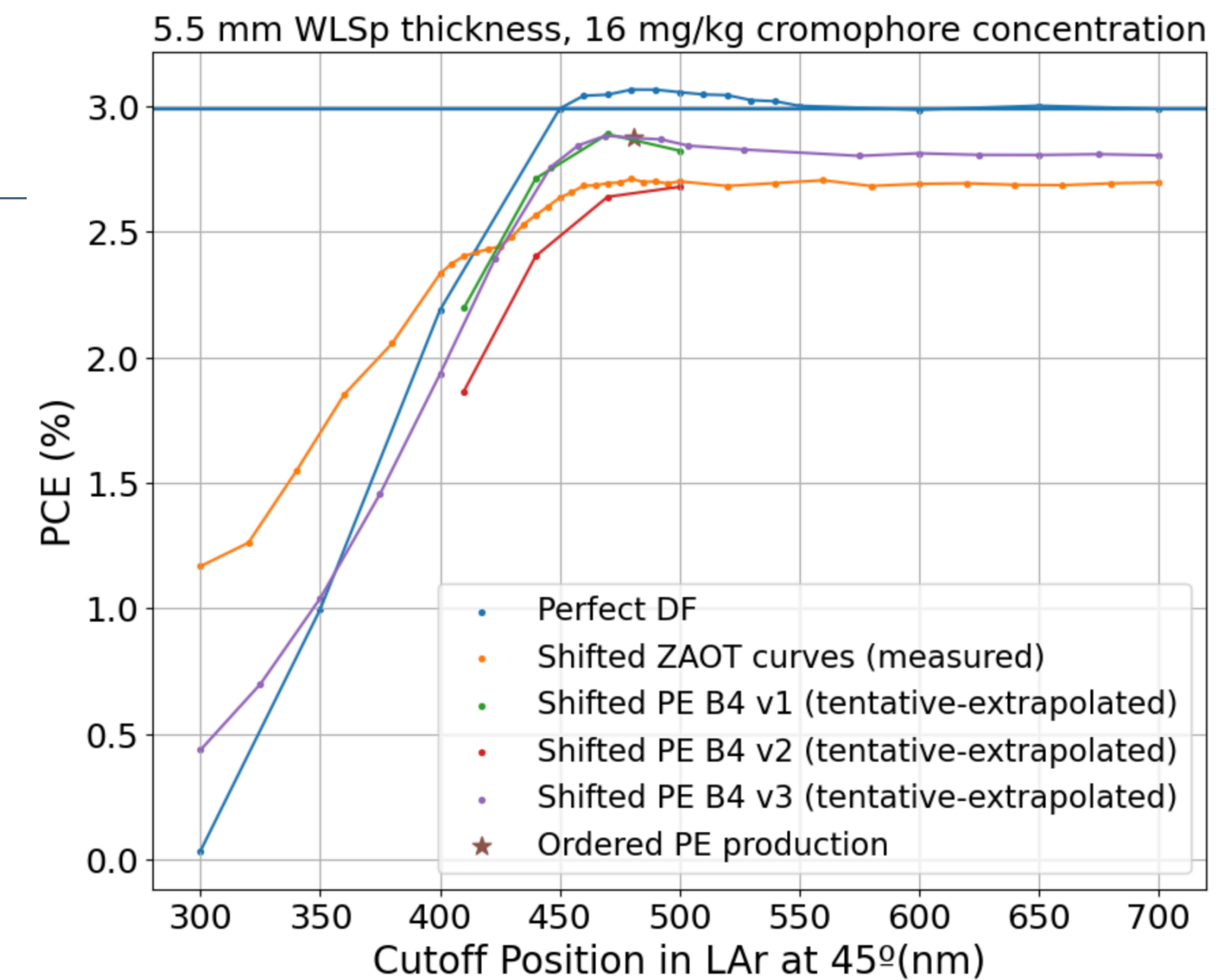
Photon Export production

- Second pilot production didn't give satisfactory results.
- Third pilot production today.
- Meeting with PE export on Monday to take a decision:
 - Proceed with current results even if not optimal
 - New pilot production
 - Go back to previous version of filter
- After pilot production actual production will take less than a week
- In the best of the cases filters will be in Valencia on November 24th
- Then three weeks for shipment + coating + shipment. So they could be at CERN by December 15th. Is that OK ?

backup slides

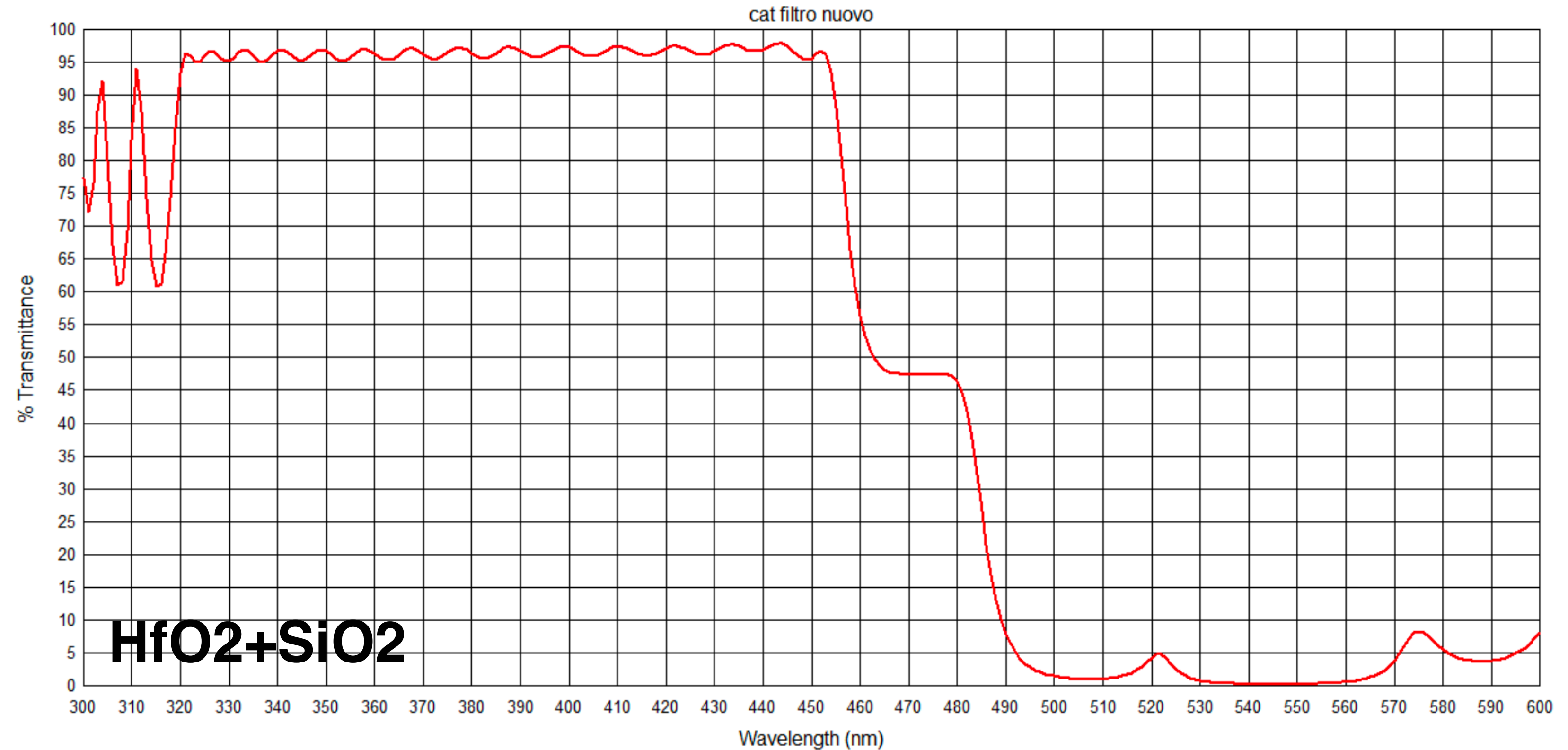
PhotonExport version

- PE has performed 3 different simulations
- Julio's simulation shows that v1 and v3 have similar performance
- We recently learned that v3 has coating on both sides of the substrate (v1 + coating other side)



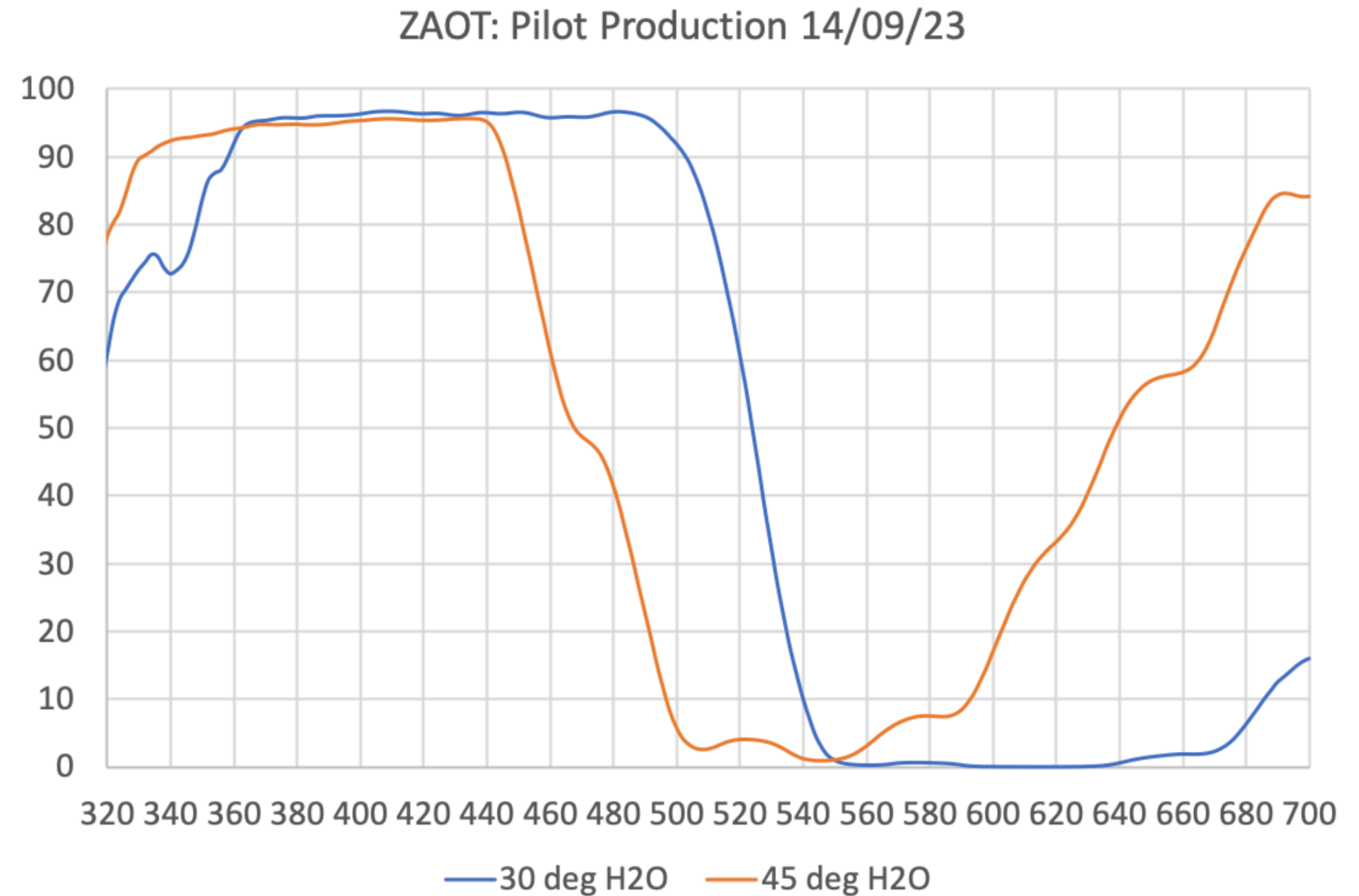
ZAOT optimisation

- New simulation of the ML structure to achieve a cut-off at 475 nm
- Good transmission below the cutoff (>95%)
- Transmission below 2% above cut-off, with reasonably wide trapping range



ZAOT pilot production

- Not as good as expected (narrow trapping range)
- New pilot production next week



Previous Schedule (27/09/2023)

- PhotonExport:
 - We have ordered filters today with v3
 - Since substrates were ordered few weeks ago we expect the delivery by October 20th (to be confirmed)
- ZAOT
 - New pilot production next week
 - Production to be launched later. They should be ready by October 20th
- pTP coating in Campinas
 - Filters will be sent to Brazil by October 23rd
 - They should be back to CERN the 2nd or 3rd week of November