

# **LAr R&D Progress Updates**

## **03/24/26**

**Yichen**

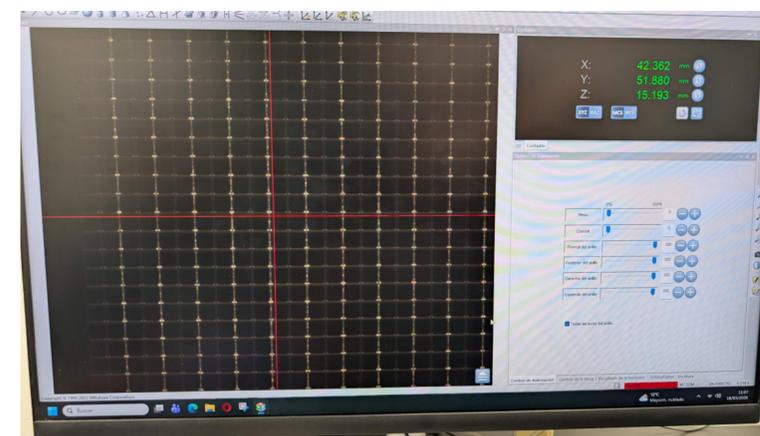
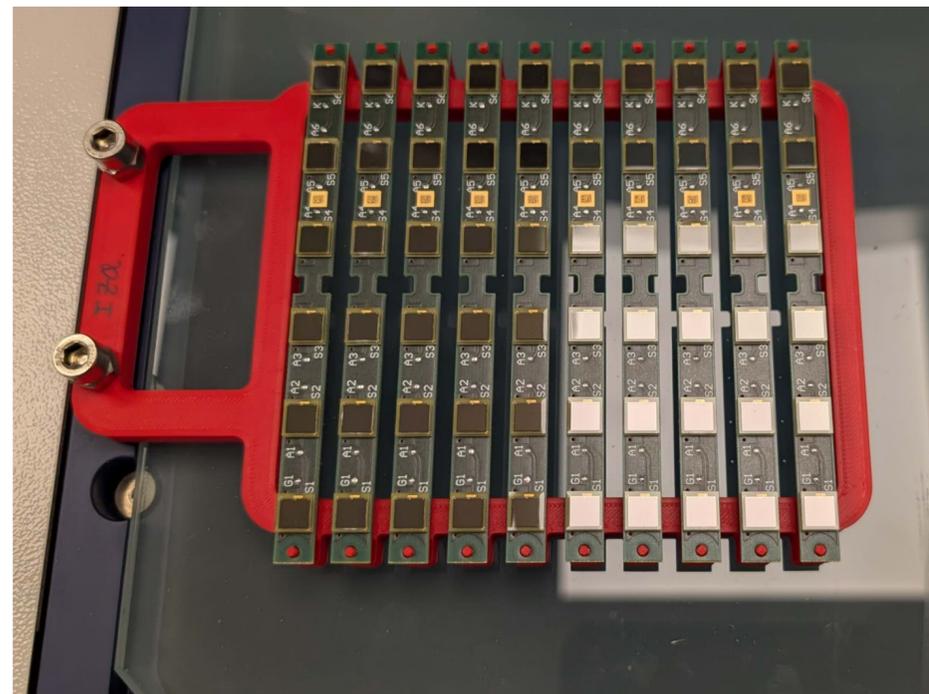
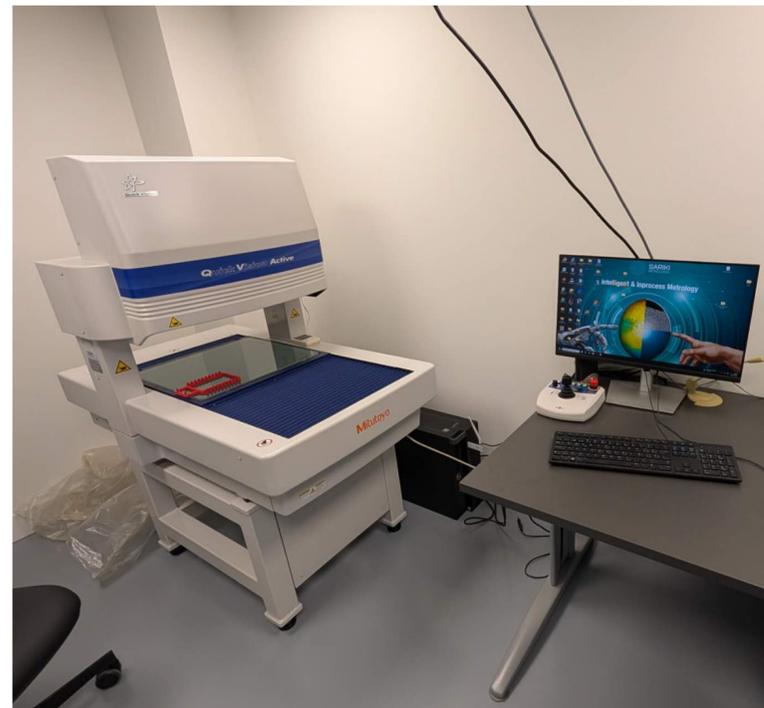
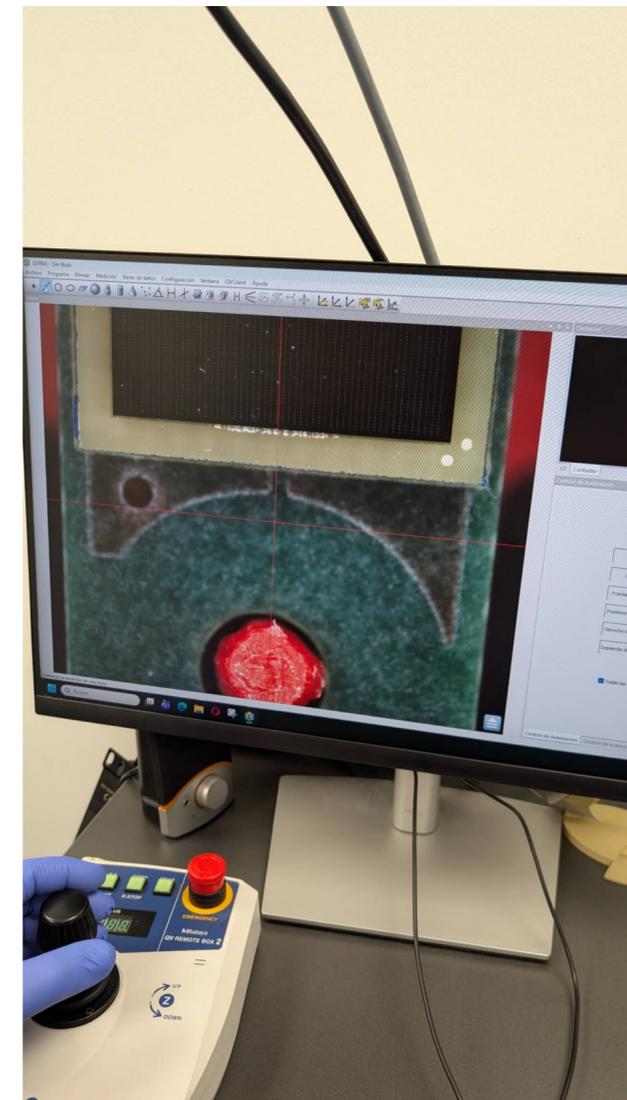
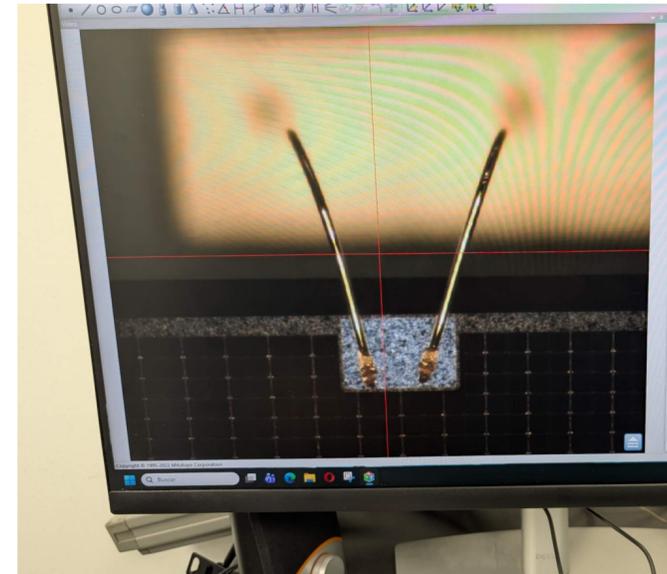


# Lab Safety and Space Management

- Xenon Collection Safety approval
  - Lab safety got back to me
  - Peter is visiting highbay lab tomorrow morning at 10am
  - We are going to discuss the setup and Work Permit process
- DUNE HV Test chamber EEI modification
  - I inspected and approved EEI
  - Some modification needed with change on connection scheme
  - The setup needs to be re-approved and I'm consulting Joel for procedures
- LN2 supply dewars
  - Shanshan used the new dewar and it worked very well
  - Put in an order for another 2x

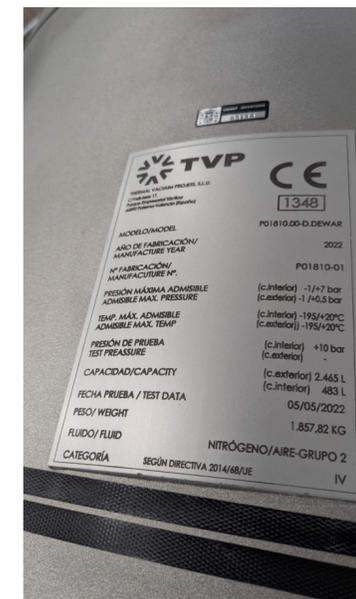
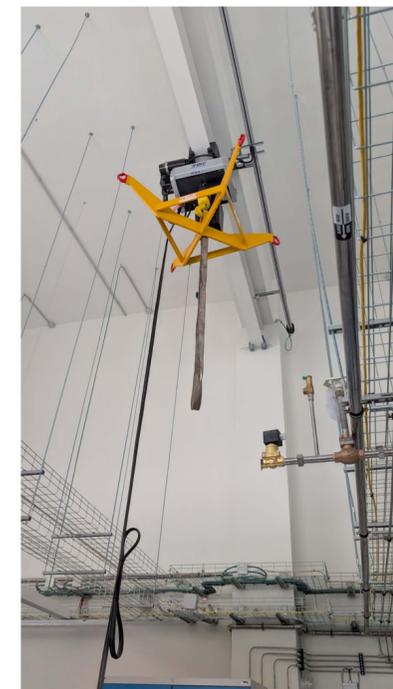
# DUNE HD Mechanical Measurement at CIEMAT

- QA/QC for DUNE FD1 Visited on Wednesday after last weekly meeting
- Given the HD X-Arappucas used a design with rigid PCB mounted SiPMs
  - The contact to the WLS plate is depends on the flatness of the SiPMs
  - The SiPMs are assembled on PCBs with a group of 6pcs in Italy
  - An optical measurement is conducted at CIEMAT with optical method
    - 3D vision machine
    - Not a profilometer
  - 10% of the SiPMs will be tested at CIEMAT then sent out for assembly



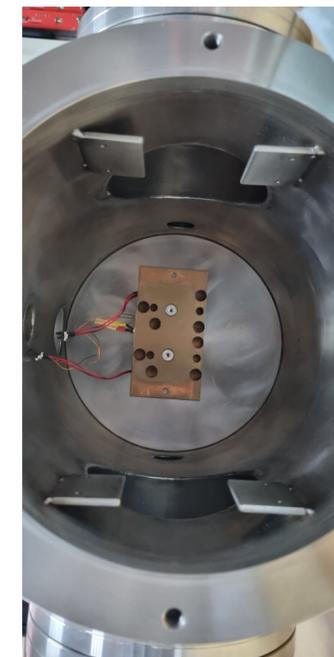
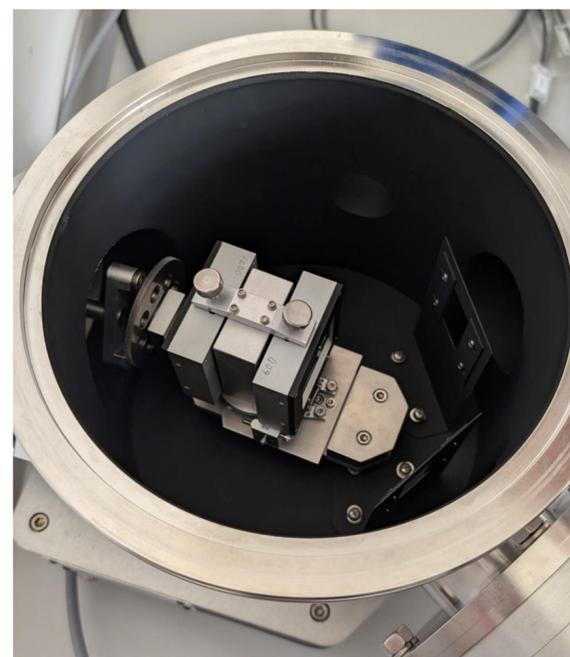
# DUNE VD X-Arapuca Cold Test

- The panel for VD will be assembled at CIEMAT with full electronics for cold test in a large cryogenic vessel
  - The full assemble of a XA module take 8 hrs
  - The vessel has a height of 2m with inner diameter of ~132cm, about 2500L volume
  - No MLI insulation, requiring all time pumping during testing
  - About 20-30 XA modules can be put in one batch, testing take about 2 days
  - Very labor intensive operation



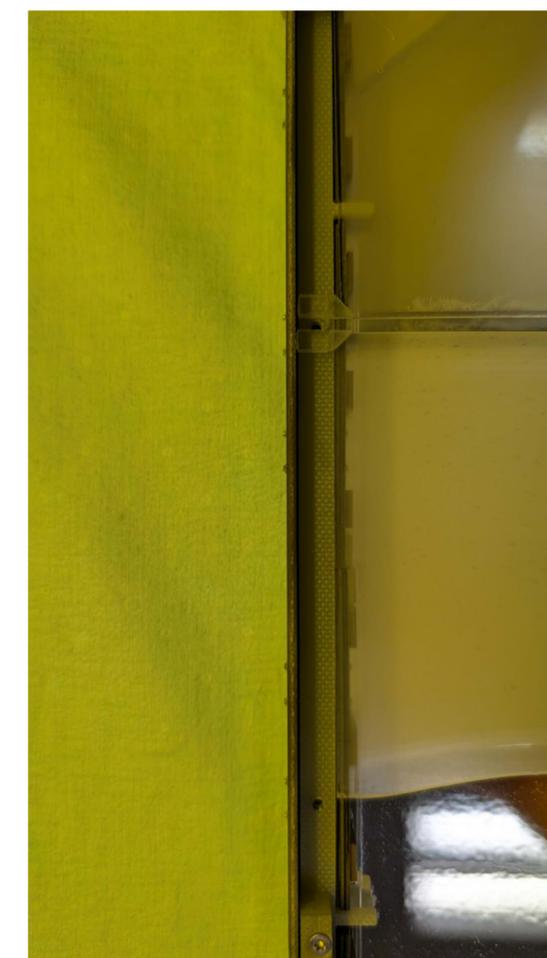
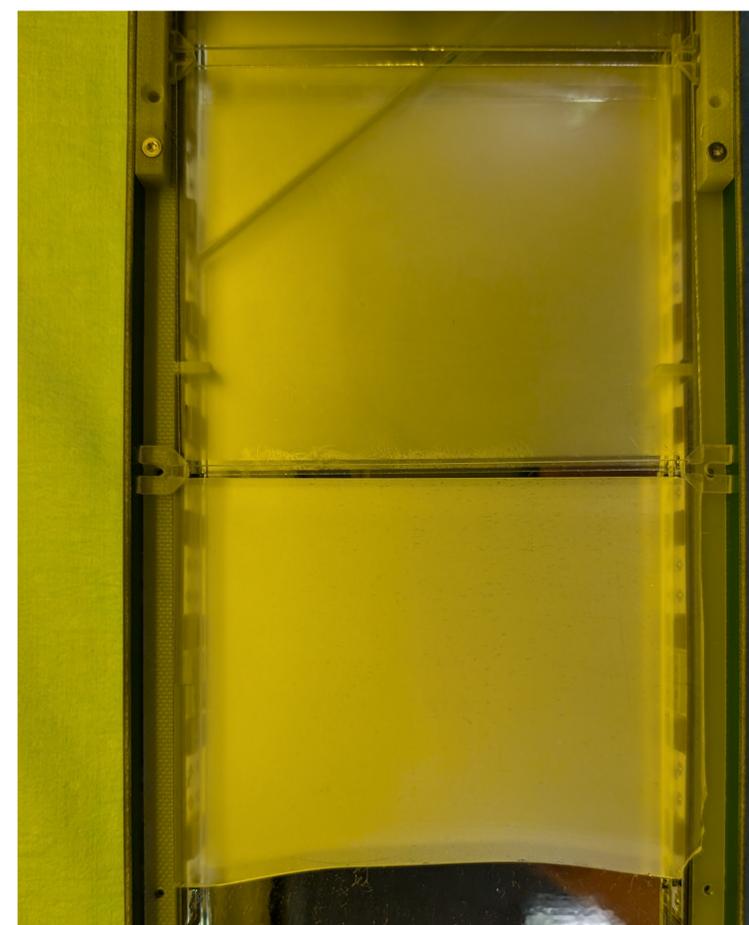
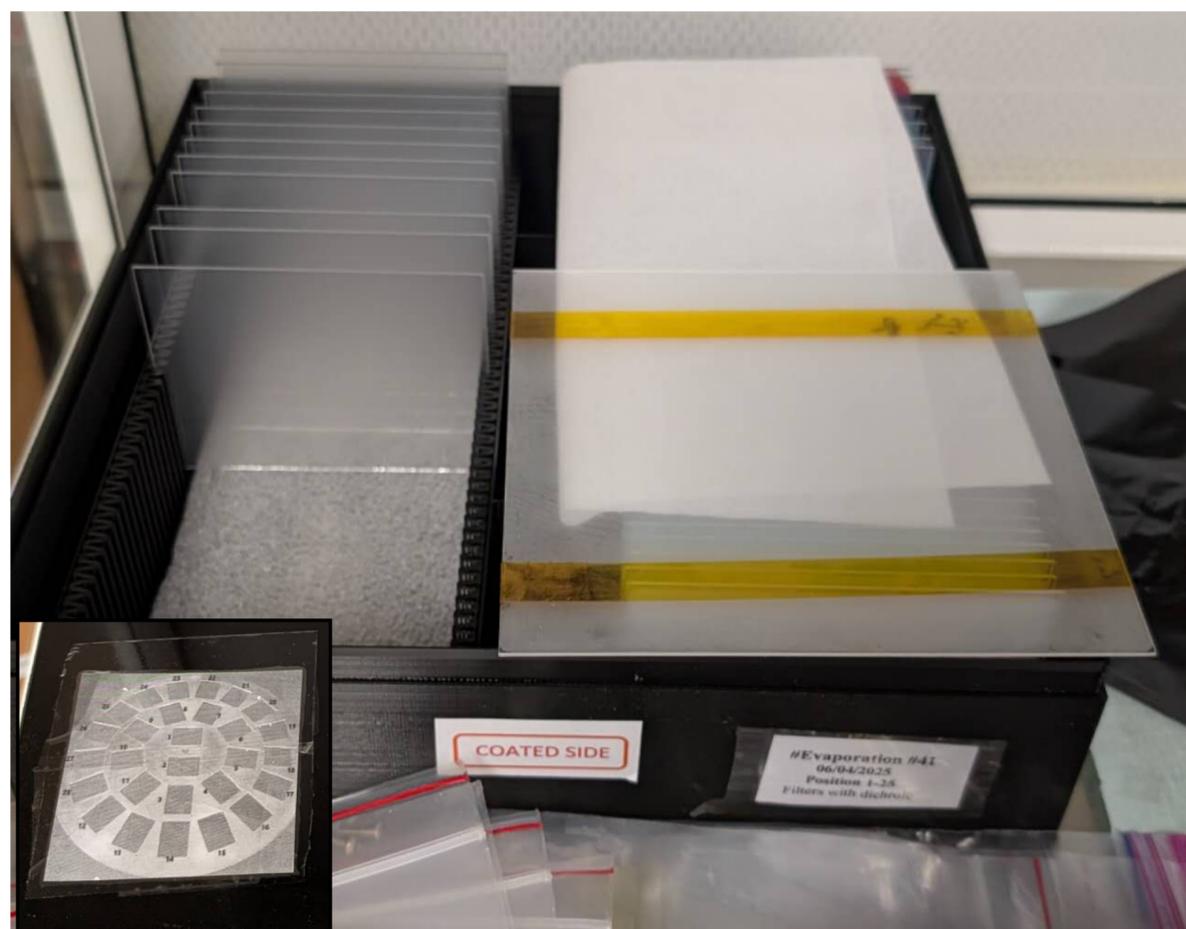
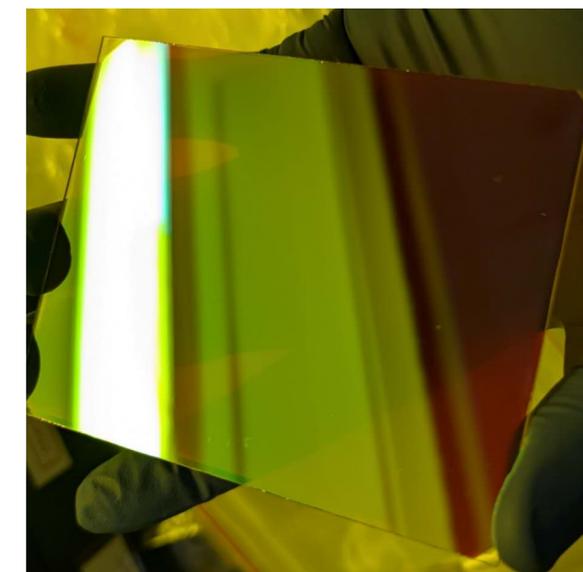
# Monochromator with cryocooler

- They are constructing a monochromator system with cryocooler
  - New monochromator with dual lamps(Deuterium+Tungsten) and dual grating, also from McPherson
  - Cost is about 130k Euro with 2+ yrs lead time
  - Cryocooler for SiPM to cryogenic temperature
  - The UV grating parts is the same as ours



# Filter comparison

- We can only do visual comparison now
- Our 3rd batch filter has better uniformity, less opaque
- Their filter has no direct thickness measurement, just quoting a unit area mass
- Probably need to get a filter from direct comparison



# Discussion with CIEMAT

- We had a meeting with Carmen and Clara at the end of day
- They were willing to provide a broken filter for us to compare
  - Carmen was not able to locate the item, will pass it to us in the future if found
  - For the good filters, they would consult the Brazil group first and suggest us asking directly
- They are ramping up on the testing with a low level of generic R&D at this moment
  - We could contribute to the testing in the future
- We were suggested to attend DRD2 collaboration
- The measurement of our filter is planned this week

# Discussion with summer students

- I had a brief meeting with the summer students
  - Amoggh, De Anza College, freshman
  - Henry, Rutgers Univers, sophomore
- Henry is going to stay 06/01-08/07, Amoggh will be 2 wks later
- Both are planning for PhD program after college
- Jay already provided some papers and I will provide more reading materials
- Plan for a following up meeting in a month