

DUNE VD PDS

Installation of V5 at CERN

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Henrique, Manuel, Flavio, Sabrina, Chris
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VD PDS module version 5

- Redesigned by the CSU engineering team (Zach Rautio, Jay Jablonski, Dave Warner)
- Updated design (based on the previous modules) with some modifications
- Parts made/collected in Colorado, then sent to CERN and built by the CSU team
 - Practice built at CSU with blank filter plates before being disassembled and sent to CERN
- Built at CERN in a “yellow” room (windows covered in tarp, lights covered in filters) to not damage wavelength shifters

Bottom filter-frame

- PTP-side faces toward the bottom of the cold box at CERN
- Dichroic-filter tiles reused from V2



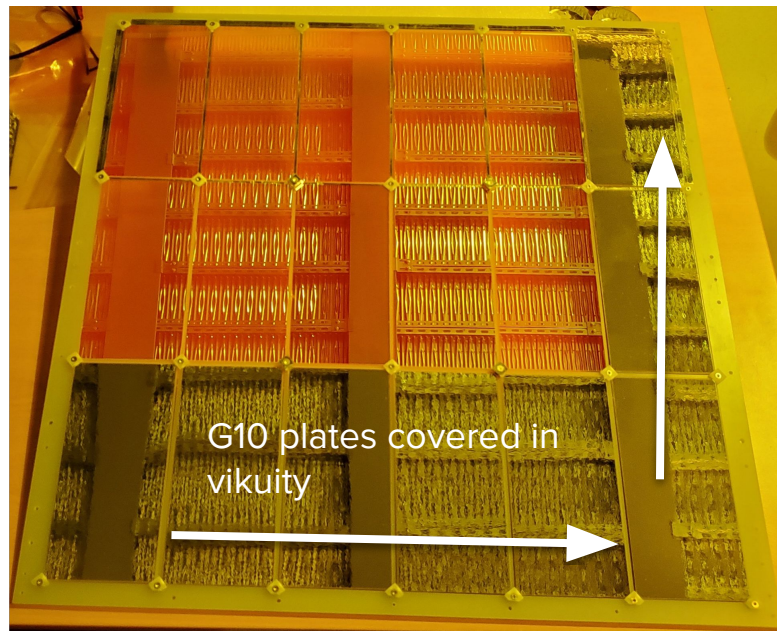
Top filter-frame

- PTP-side faces toward ceiling in the cold box at CERN
- Dichroic-filter tiles made in two batches of 10 by evaporation (shared between V4 and V5)
- Vikuity adhered to G10 instead of glass
 - we observed vikuity to peel off glass in V3 (after cold test) to a large extent (see backup)

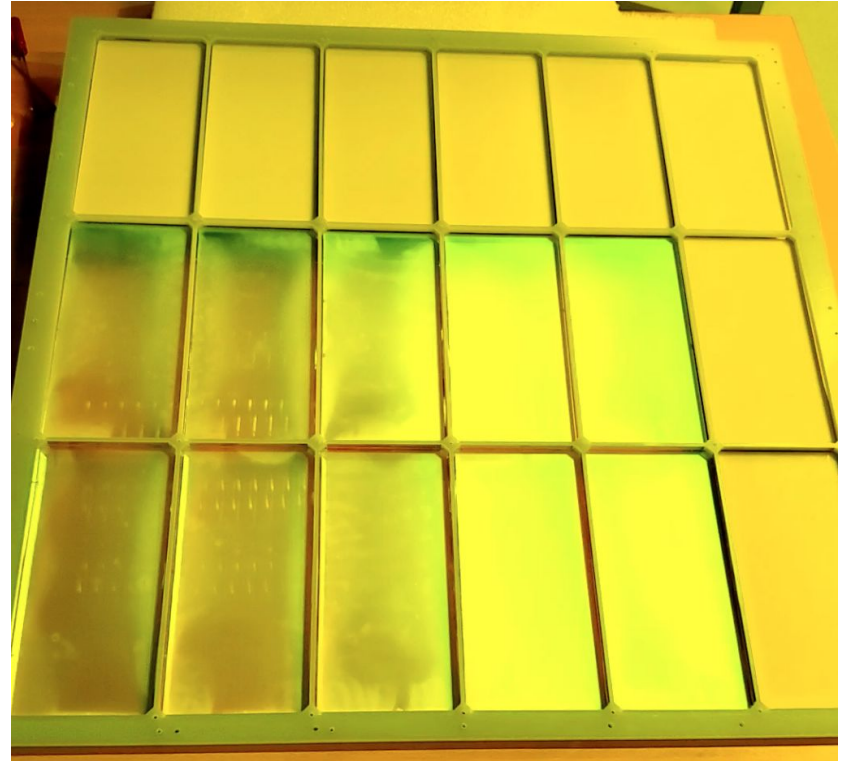
2nd
evaporation

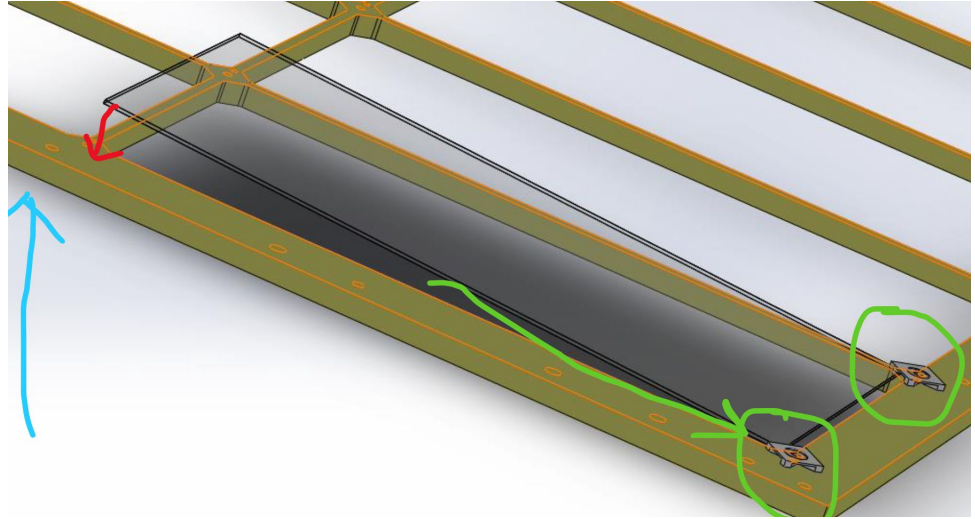
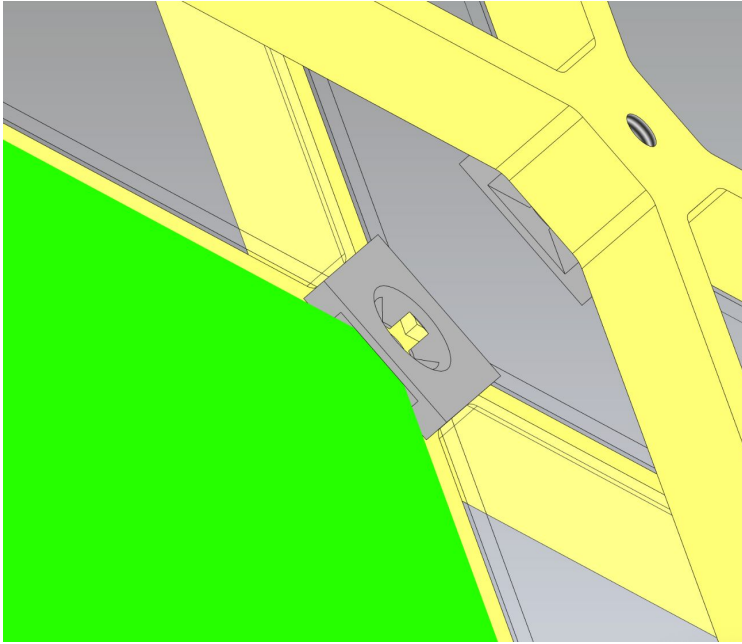


1st
evaporation



Filter Frames PTP sides





- Dichroic-filter plates are fixed in place by G10 lock nuts and a screw (screw holes are *threaded*, which simplifies installation)
- The process of populating the filter frame with tiles is straightforward and can be done by one person

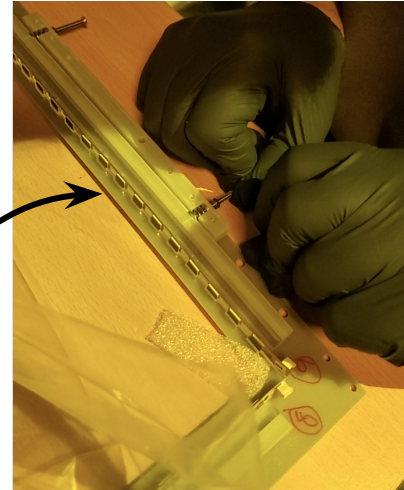
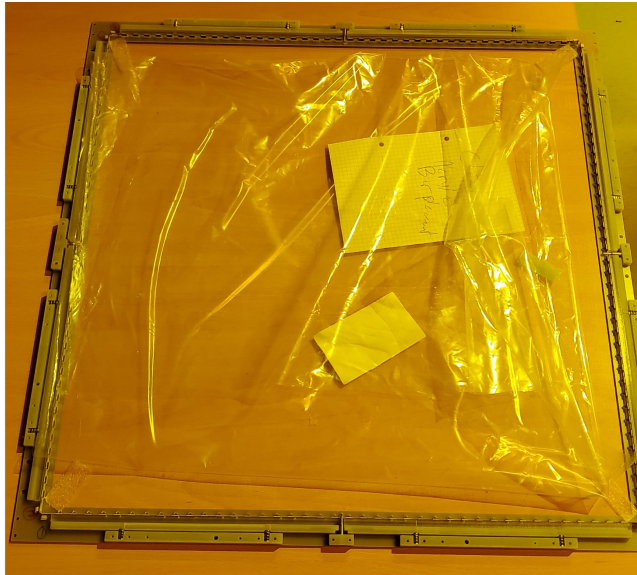
Practicing at CSU

- We practiced the filter installation at CSU
- A full practice assembly was done at CSU prior to sending the materials to CERN (with glass blanks in place of filter tiles)

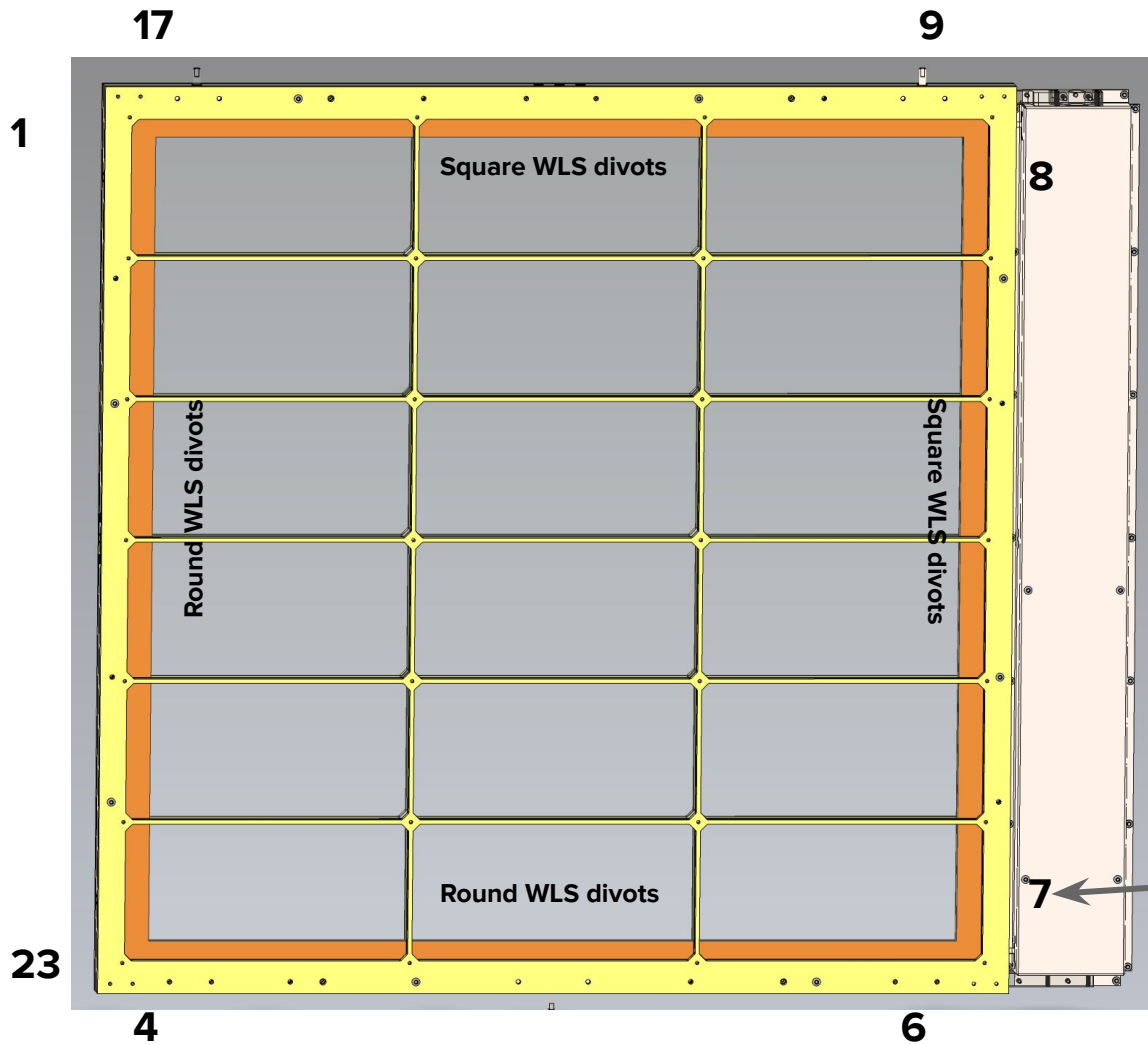


Kurt Francis (NIU) (left) and Prof. John Harton (right)

WLS Frame



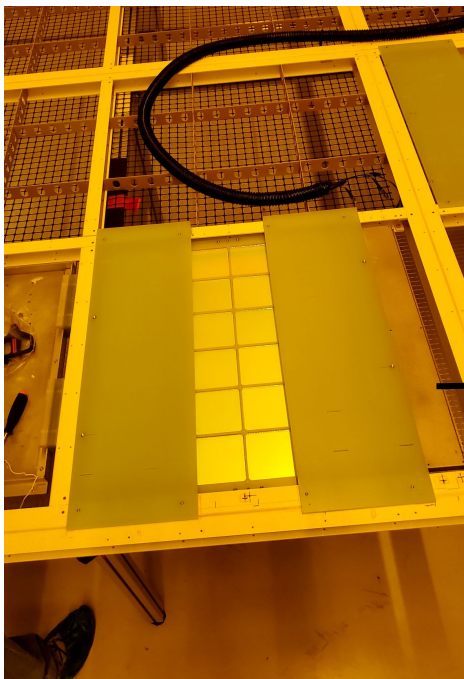
- SiPMs secured in frame with a spring-loaded bar (“backbone”) adjustable by hand with a removable screw (very controlled).
- SiPMs can be seen during the entire compression process.



- Channel 1: circuits 9,17,8,1
- Channel 2: circuits 6,7,4,23

Number corresponding to a flex circuit

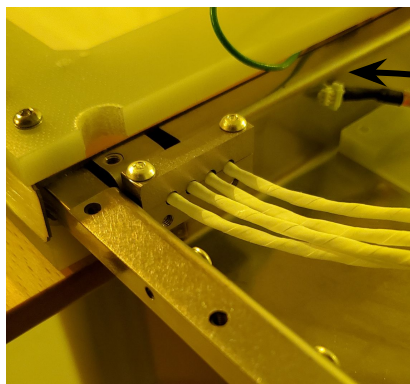
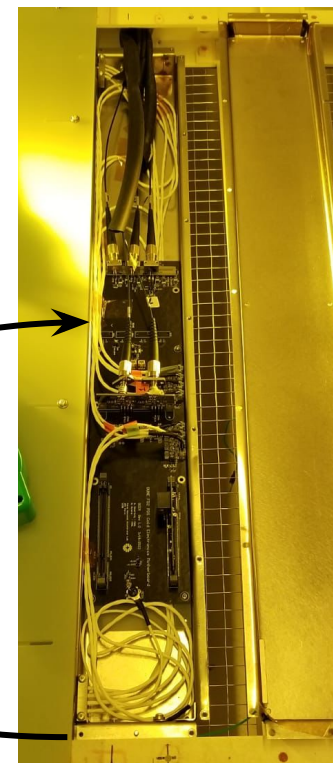
Installation in Cathode



V5 fully installed
in the cathode

Flex circuit cables checked for shorts and continuity.
Ring terminal GND unused (kaptan taped to cable)

Electronics box / diving board
with power-over-fiber and
signal-over-fiber connected ->



Electronics box finished
(with power/signal over
fiber, circuit board, etc),
thanks to Jay, Flavio,
Manuel, Sabrina, Henrique

Cathode in Cold Box

Cathode moved from the clean room to the cold box mid-day monday (Oct 31, 2022)



All connections setup and checked by Henrique, Flavio, Chris, Manuel

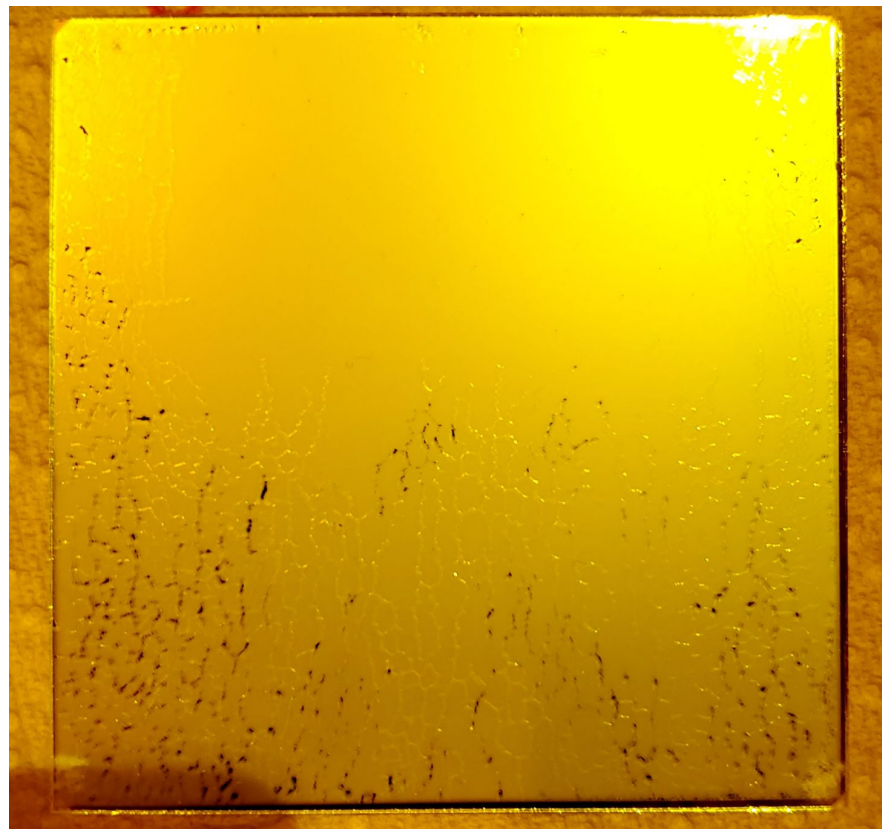


End of Talk

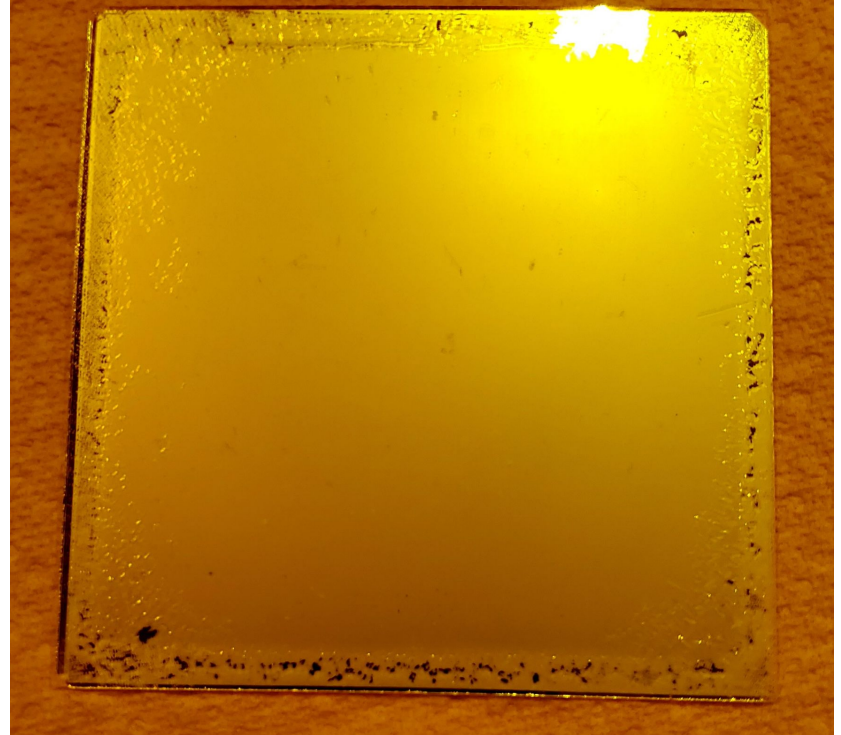
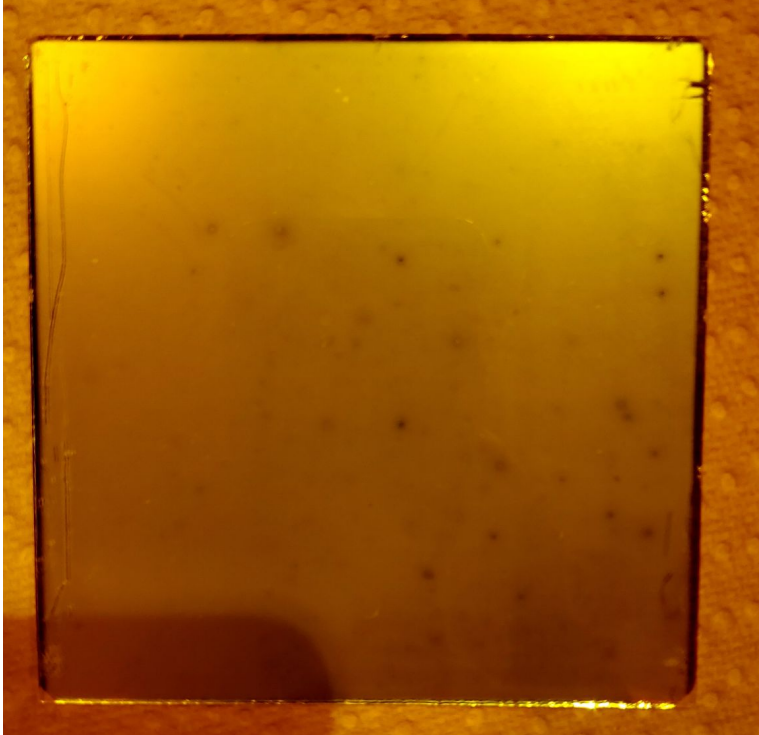
Questions?

Backup

Tiles in V3



Tiles in V3



Vikuity in V3



Mesh standoffs

