

Module-1

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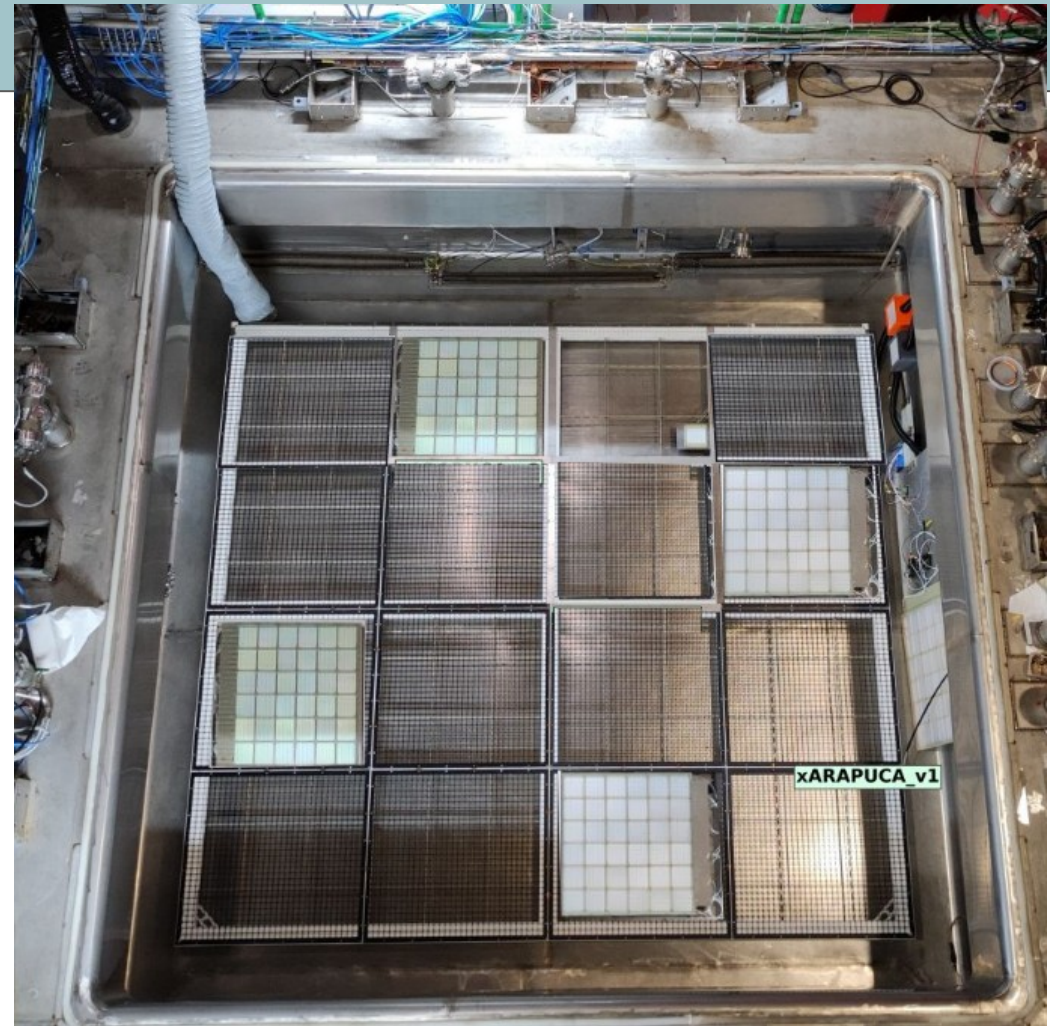
FD2-PDS Longevity qualification and Stability test Workshop -
07/06/2023

Organization

- An evolving google doc to keep track of items needed and plans [here](#)
- Timeline is not set yet(?) and will likely depend on fabrication of components:
 - September installation?
 - Until end of year for running?
- Coldbox possibilities:
 - For how long can we run? Do we want refills?
 - Should we request the argon already?
- Specific discussions will start taking place in the [Friday Module0 meetings](#)

Installation Goal

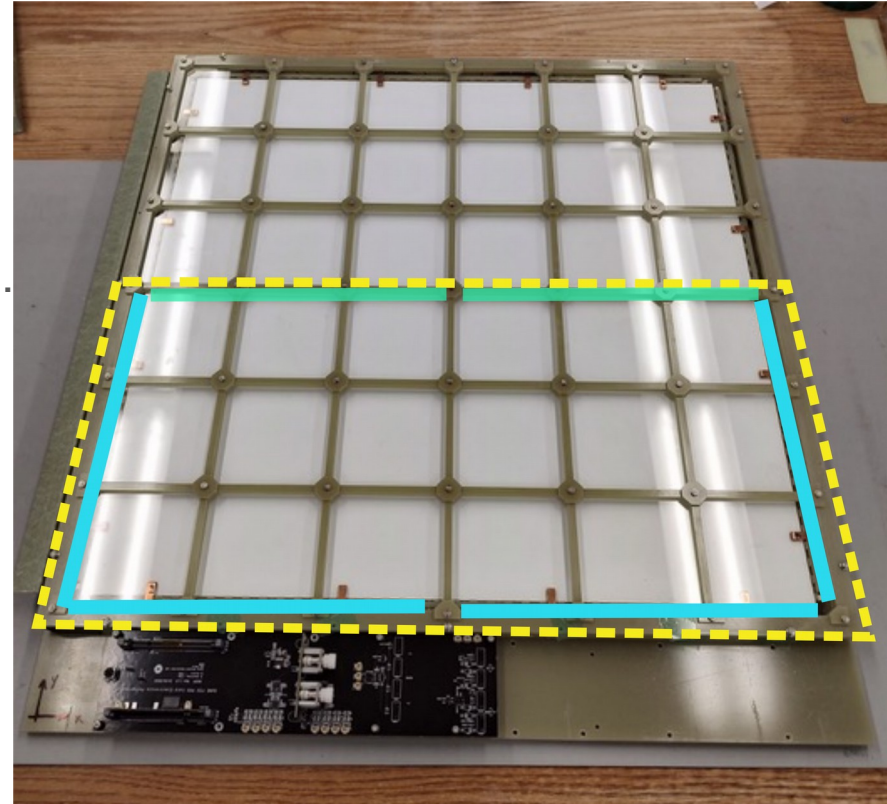
- CATHODE:
 - 4 single sided xArapucas (which positions?)
 - 8 SoF channels (4 boards)
 - 16 fibers + spares + feedthrough
- MEMBRANE:
 - 1 half xA with HD amplifier
 - 1 half xA with VD amplifier
 - Standard candle
 - mechanics need to be revisited
- Rack:
 - 8 kohérons
 - CAEN digitizer or other?
 - DAPHNE? (+optical receiver?)
 - New laser box (we'll need new security approval)
- Flanges:
 - 2 DB15, 1 hiroshe?, fiber feedthroughs
 - should be OK but to be checked



- Goal: **reproduce the module testing done in Module-0** to ensure successful installation (and optimize/certify the testing procedure)
 - Independent room temperature and LAr check of electronics, with and w/o PoF
 - Full module test in large dewar (try to take reference data?)
- Need to go over what material is left from Module-0 construction
 - In principle only the mini rack is gone :) (but to be verified)
 - Will require the laser safety approval again
- ~1 day per module?
- People?
- Alternative: If repeating the test stand is not possible we could do a pre-fill as in August 2022

xArapucas

- 2 full xArapucas with downselected SiPMs can be available from CIEMAT and Naples test bench for PE studies, after finalisation of their measurements
- 2 full xArapucas for cathode need to be fabricated
 - Where? (CERN?)
- 2 half-xArapucas for membrane:
 - The level of LAr is too low, will not cover a full xArapuca → idea to fabricate “truncated” detectors.
 - Could implement 4 or 6 flexes
 - 8 downselected HPK flexes available



xArapucas: list of 'missing' items

- SiPMs for 2 full xArapucas (16 flexes), and 2 extra per half-xA
- Signal cables (18)
- Two full frames
- Two half frames
- 4 cathode electronic boxes. 2 for membrane (but how?)
- Dichroic filters for 2 full xA and 2 halves
- WLS for 2 full xA and 2 halves
- Vikuity (probably for all photodetectors? Or only the new ones?)

- SDSMT team is doing QA/QC tests on a new fiber bundle
- 4 tubes with 6 fibers each (total 24 fibers) for the cathode:
 - 2 SoF, 2 PoF, 2 spares per xArapuca
 - Modified fiber end length wrt M0 (reduced to 15cm)
 - Reduced PTFE tube diameter ($\frac{3}{8}$ " OD and $\frac{1}{4}$ " ID)
 - **Not possible to route them within the cathode! → need dimensions to be measured at CERN**
- Feedthrough (17 fibers + spares? ~20)
 - New idea for feedthrough to be tried

- 70 new GaAs OPCs in hand being tested and distributed (i.e. 20→ CERN)
- New laser box in production w/8 lasers
→ expecting all new installation
- Some considerations for preparations:
 - Check M0 measurements to correctly tune laser power output
 - Ensure correct fiber treatment as in last coldboxes
 - Fiber labeling? With which solution are we happy? Plans for FD?
- Light shielding:
 - Do electronic boxes need modifications?
 - Silicon

- CATHODE:
 - On-going effort to re design the SoF board
 - Timescale not known yet
- MEMBRANE:
 - HD cold amplifier → does DMEM need work?
 - VD cold amplifier → expecting new prod?
 - Discuss whether the extra 2 flexes per xArapuca should be used in a third channel

Conclusions/Planning

- Still some discussions needed on material availability
- Some actions/checks at CERN to be done:
 - Test stand condition
 - Flanges
 - Cathode positions/dimensions
- Timescale for component availability + desired run time = installation dates