FD2 PDS Short-term Plan

DUNE Far Detector #2 Photon Detector System FD2 PDS Photo-collector Working Group

Last update: September 27, 2022 Ryan Rivera & Flavio Cavanna

FD2 PDS Weekly Schedule

Cold Box CRP3 Install 12-Sep	Cold Box CRP3 Install 26-56p 37 55p 39 39 30 30 30 30 30 30	Reviews and Deliveries	Module-0	Cold Box	Date	Week #	Month
Cold Box CRP3 Initial 19-Sep 39	Cold Box CRP3 Initial P.S-5pp 39				05-Sep		
Module-0 Orders Cold Box CRP3 Run 10-Oct 42 Cold Box CRP3 Run 10-Oct 42 Cold Box CRP3 Run 10-Oct 43 Cold Box CRP3 Run 10-Oct 44 Cold Box CRP3 Run 10-Oct 44 Cold Box CRP3 Run 10-Oct 45 Cold Box CRP4 Run 12-Oct 45 Cold Box CRP4 Run 12-Oct 12-O	Module-0 Orders Cold Box CRP3 Run 10-Oct 42 Cold Box CRP3 Run 10-Oct 42 Cold Box CRP3 Run 10-Oct 43 Cold Box CRP2 Run 10-Oct 44 Cold Box CRP2 Run 10-Oct 45 Cold Run 10-Oct 45 Cold Run 10-Oct 45 Cold Run 10-Oct 10-O			Cold Box B++ Run	12-Sep		
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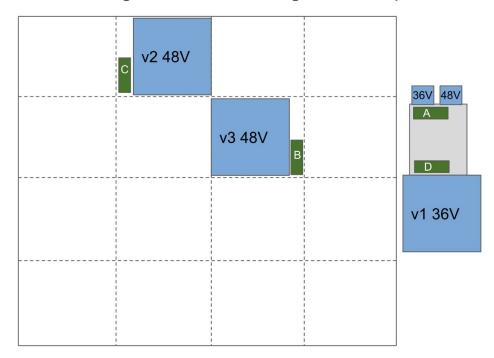
XA Frame Mechanics Plan

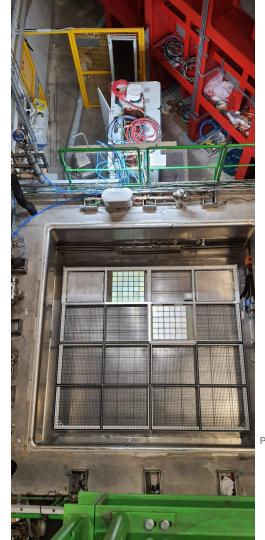
- V4 and V5 will be the last divergent frame design
- Starting with the V6, we will have one joint VD frame design
 - Same design for Cathode and Membrane XA frame; Membrane will just have a blank backing board.

CRP3 Cold Box Installation

Active now:

Fix light leakage, attempt to stop laser
 leaking, demonstrate bias generation options

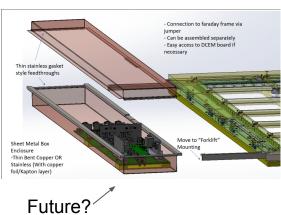


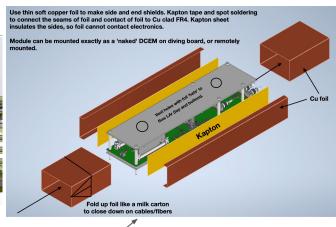


Picture from Chris Macias (Iowa)

CRP3 XA Modifications

- Light leakage mitigation is critical
 - o E.g. Copper-clad G10 box
 - E.g. Silicone/potting







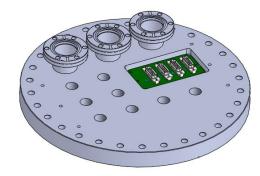
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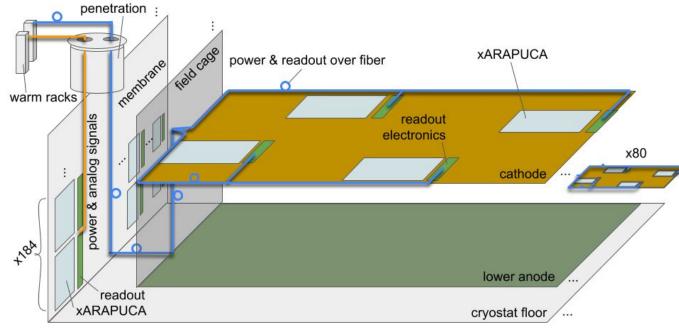
Cable/Fiber Topology

1 HD-cable per 2 membrane-XA

8 fibers per cathode-XA

 15 Response & Monitoring fibers per penetration (20 penetrations per long-wall)



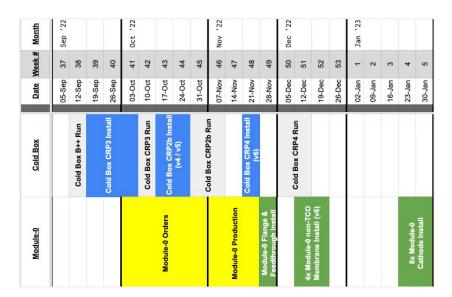


CE Schedule (Production/Installation)

- 60 FBK + 140 HPK <u>SiPM Flex boards</u> ordered by UCSB
 - Flex expected 14-Oct, then ship to INFN
 - INFN/Spain expect 952 <u>SiPMs</u> by 24-Oct
 - **■** Enough for only 5 X-ARAPUCA!
 - 250 FBK + 702 HPK (+750 FBK Jan 23')
 - Missing 1700?
 - o INFN is planning **SiPM population** order
 - Keep SiPMs for 8x Membrane XA
 - For CERN/Ciemat/INFN XA assembly?
 - Ship NIU SiPMs for 8x Cathode XA
 - <u>Fallback plan</u> is use SiPMs from 4x Cold Box XA and 3x Test Stand XA for 12x ProtoDUNE2-VD install
- 17-Oct: Readout/DC-DC PCB Designs and

BOMs frozen

- 2-weeks to place order + 4-week lead times on turnkey orders
- Critical Path Severity: High

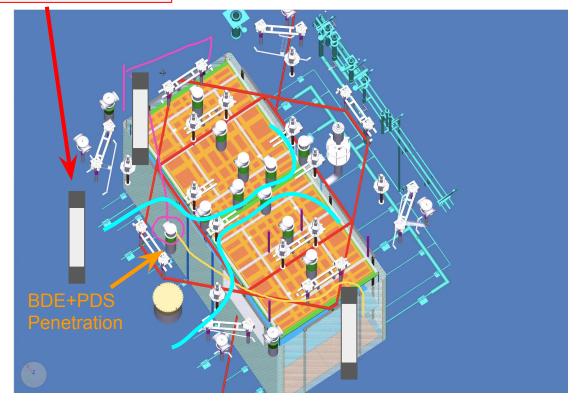


Do we consider 1-ch (4-flex) X-ARAPUCAs?

Module-0 Topology

- Flange/Cables/Fibers/Cable trays installed November 2022
- 2-or-4 Membrane-mount XA installed December 2022
 - One column on short-wall is being pushed from a mechanical perspective
 - This could have a significant interference with the instrumentation cabling or CALCI.
 - PD consortium would like to plan for two columns, one on each short-wall
- 8 Cathode-mount XA installed January 2023
- Response & Monitoring installed
 December 2022 and January 2023
 - Attached to top CRP
 - Direct to XA
- 2-or-4 Membrane-mount XA installed February 2023
 - o The 2nd column on TCO side

New possibility?!



Organizing FD2 PDS Travel

- PD team is entering unconfirmed/confirmed travel to help everyone plan:
 - https://docs.google.com/spreadsheets/d/1qT_wY5rvEtjS2t741bd8TGejxSAtKZIWIWu3m8Goz zA/edit?usp=sharing
- Latest daily schedule maintained here (source for weekly schedules):
 - https://calendar.google.com/calendar/u/0?cid=bjVmaGNqZ2NhMzM1MmFrbmJtYjNlODRkMmt AZ3JvdXAuY2FsZW5kYXluZ29vZ2xlLmNvbQ