

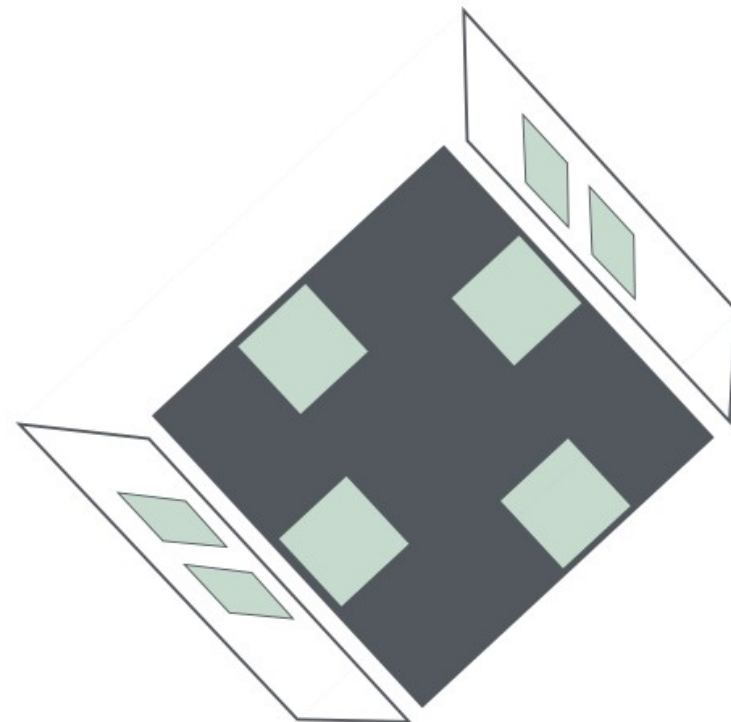
# M1-November Crisis Committee

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M0/M1 meeting - 03/10/2024

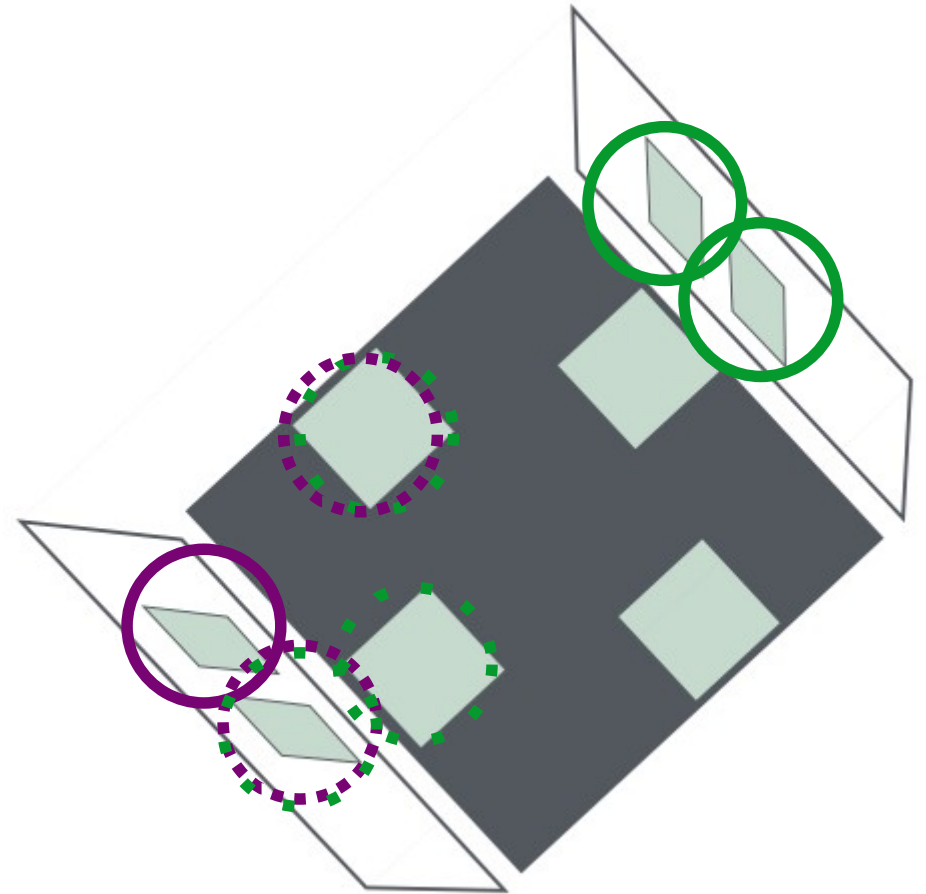
# Original plan

- 4 cathode modules
  - SoF readout
  - PoF power
  - HPK SiPMs → 1½ HPK, 2 FBK
  - Double sided → vikuiti backplane
  - **ORIGINAL GOAL: test SoF readout with HPK on lower bias + 8 channel SoF receiver**
  - **Why FBK: test with smaller signals (even if not HPK) + warm electronics**
  - **Why not: stop messing with “interesting tests”**
- 4 membrane **full modules**
  - 2x HD-readout/FBK SiPMs
  - 2x VD-readout/HPK SiPMs
  - **ORIGINAL GOAL: consolidate membrane readout**
  - **Plus for VD: no previous coldbox test with HPK**
- Schedule:
  - Coldbox closure? (8 Nov? 15 Nov?)
  - Runtime? 2 weeks?



# Need new plan:

- **HPK**: 8 M1, 4 new in hand
- **FBK** 12 new in hand + 8 M1 + 16 M0 + 24 arr of october (in time for installation?)
- Cathode: how many modules? At least 8 chan testing SOF receiver?  $\frac{1}{2}$  HPK? Just FBK?
- Membrane:
  - 2x HD-readout/FBK SiPMs
  - 1 or 1  $\frac{1}{2}$  x VD-readout/HPK SiPMs
- Schedule:
  - Coldbox closure? (8 Nov? 15 Nov?)
  - Runtime? Feedback from PNS: "not sure run again"?



# Inventory: mechanics

- 4x M1-style single sided frames in fabrication → **2 shipping 18/10, other 2 (assembled) at NIU and shipped end of month**
  - 2 membrane and 2 cathode in hand to be refurbished
- 4x cold electronics enclosures **M1 style**: fabrication not confirmed
  - PoF enclosure fabricated for square boxes for now → **let B&D know if we move to tapered enclosure**
- New membrane setup:
  - **Possible to mount 4 modules, 2 on each side**
- Blue cable: 2 to be fabricated at CSU
  - Pinout: what I sent was OK? (doc in edms)

# Inventory: optics

- FBK “small area”:
  - 12 new soldering received in September (4 at Fermibal)
  - Old available 8 from M1 16 from M0 (3 full modules)
- 24 FBK “large area” late october
- HPK:
  - ~~20 flexis arriving 30/09~~ → 4 flexis only
  - 8 flexis left from M1
- **Proposal of SiPM distribution:**
  - **HD membrane modules: 1 new FBK, 1 old FBK (16 flexis)**
  - **VD membrane modules: 1 1/2 HPK (8 old + 4 new flexis) – or – 1 HPK (8 old) 1 FBK**
  - **Cathode: 1 FBK or ½ HPK + 1 FBK**
- WLS:
  - 1x 5.5mm 40mg/kg WLS now at CERN free
  - From M1: 2 in membrane modules, 2 in cathode – one has ptp on it.
  - 6 new in prod? Estimate arrival mid october OK?
- Filters:
  - All modules single sided: 128 filters for top
  - 64 ZAOT Dfilters from Module 1 at CERN → at least one broken
  - 16 ZAOT Dfilters with Carla
  - ptp glass: 105 coated at CERN, 64 to be used in ProtoDUNE → there should be 41 available
  - CIEMAT provides 8 missing glass substrates, hand carried week of 7/10

# Inventory: membrane electronics

- HD-style readout for 4 membrane channels:
  - 4 cold amplifiers (one needs the tuning?) + 1 DMEM in hand
  - Readout 2 channels per board → 2 electronic boxes
  - Warm stage to be tested?
- VD-style readout for 4 membrane channels:
  - 2 boards available (1 not populated) BUT 2022 version
  - New version still in design this week.. probably not ready.
  - New warm stage in dev.
- White cables:
  - 2 new membrane modules: need 8 short, 8 long
  - 2 membrane going from 4 to 8 flexis: need 8 long
  - 2 cathode modules (for future installation) 8 short, 8 long

# Inventory cathode electronics

- 4 SOF readout boards:
  - 4 DCEM v1.31 → in hand. 4 at APC, N at Fermilab
  - 4 laser adapter 2 stage → in hand at APC and Fermilab
  - 8 lasers → in hand. use TallBO spares or new ones at APC
  - 4 DCDC → need new? (and what voltage) → need to produce (\$)
- Fibers: current ones in good state, but
  - Potential to install all continuous fibers like in C1?
    - Long fibers for 3 modules (12 + spares)
    - Change of flange?
- PoF
  - 16 OPCs (4 OPC boards) → available from M1 plus other spares around.
  - 4x PoF enclosure: no enclosure used before. Need new ones... compatible with existing PCBs?

# Warm electronics

- SoF:
  - 1x DAPHNES V2 from Milano (one)
  - Cathode needs 4 AFE (2 channels per AFE limitation)
  - >4x 2-channel SoF receivers available (now 5 at APC, 1 Milano, 1 Fermi?) - CSU one not available
  - Goal to do a first test of 8-channel receiver → requires new board fabrication and large modification of one AFE – never done before.
  - Proposal: Milano DAPHNE as usual
- Membrane:
  - 1x DAPHNE v2 from NP02 already modified at Milano
  - 2x warm boards VD and HD?