

LArFCS Cryogenic System Progress

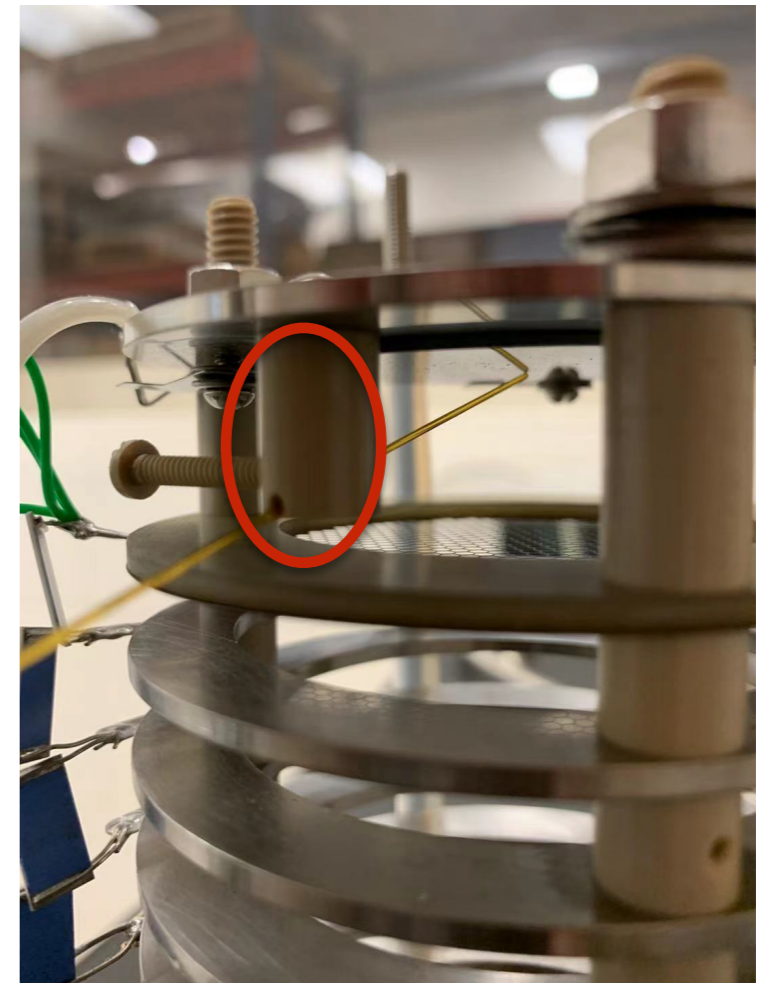
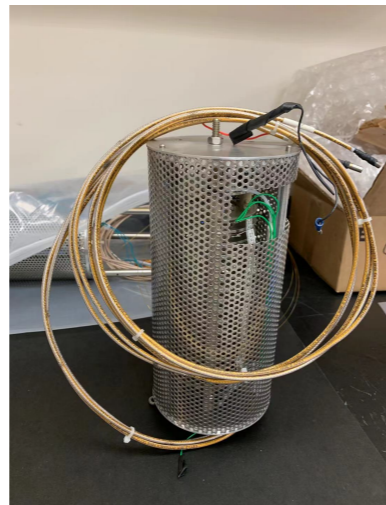
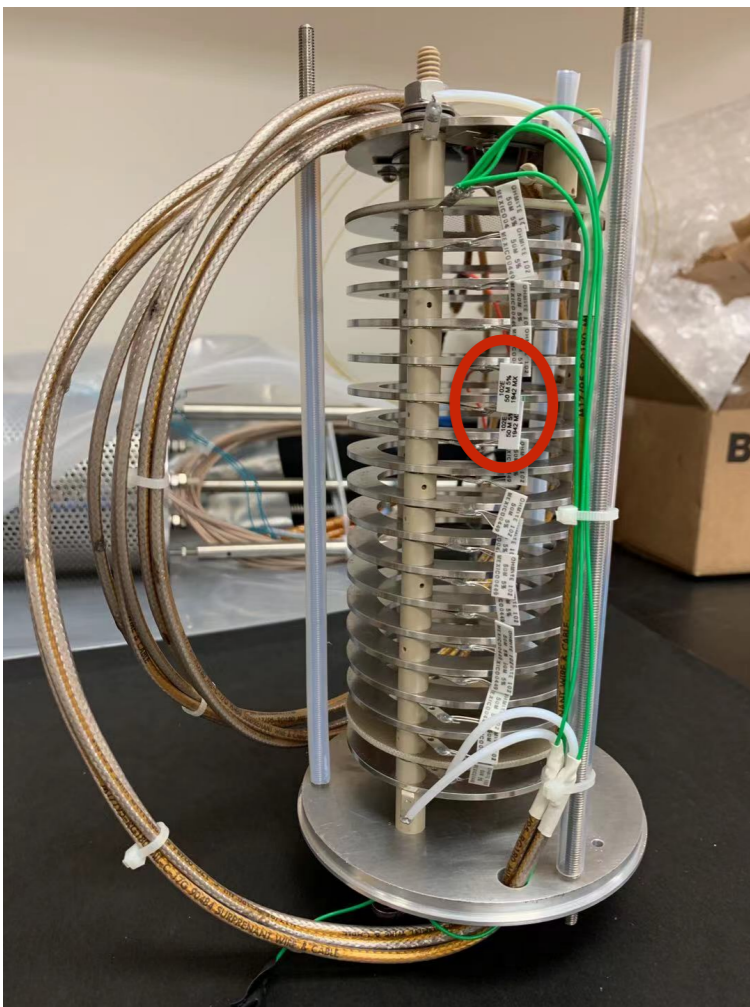
Yichen, Sergey

10/5/21

LArFCS Construction

► PrM Test at UCI

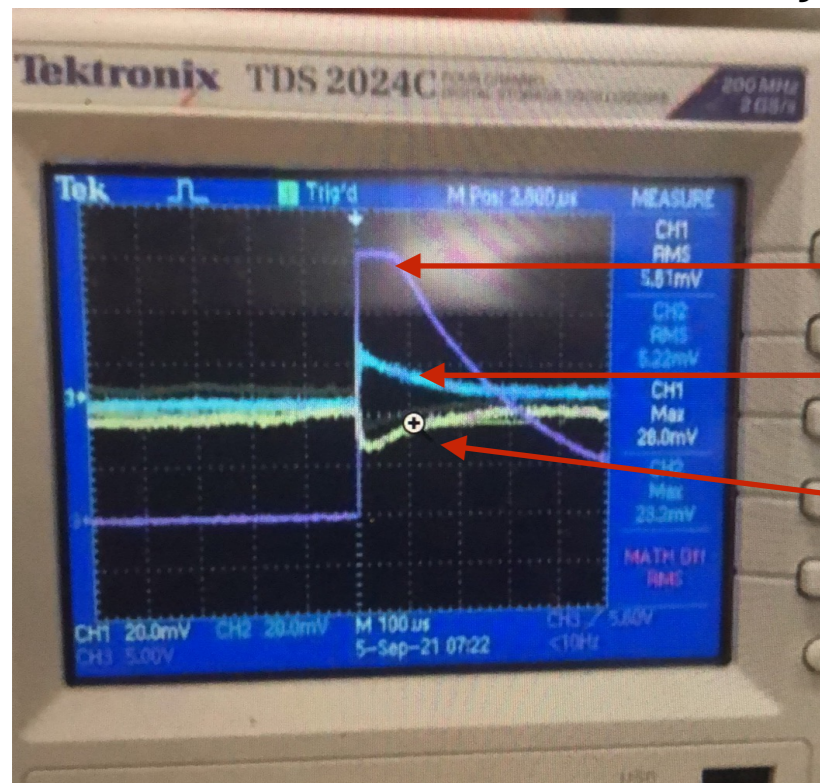
- Test in a vacuum chamber under $\sim 4 \times 10^{-5}$ Torr for protoDUNE 75cm PrM
- Fiber mounted in ~ 30 degree angle to the cathode
- Currently have some leaking issues with the system
- LAr purification system is delayed



LArFCS Construction

► Our PrM test in vacuum with Hamamatsu Xenon lamp

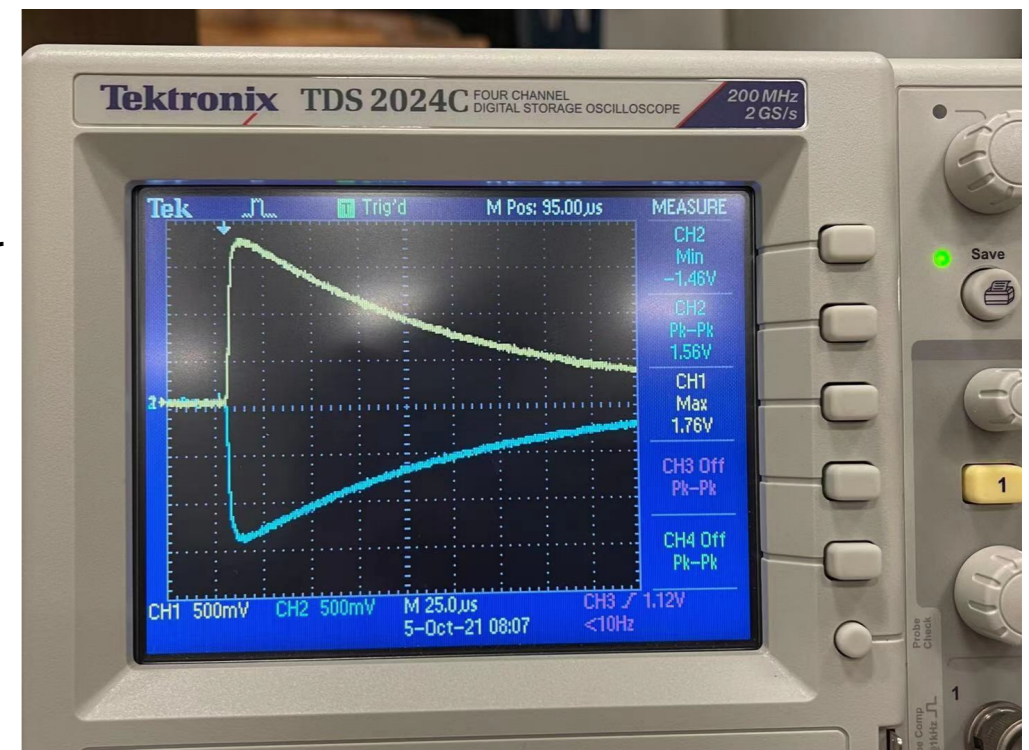
- Using old cathode on the PrM stack for years
- First start with 1x fiber: $\sim 10\text{mV}$ (5pF cap.)
 - Amplitude low as in LAr
- Increase 3x fiber: high signal amp. $\sim 1.5\text{V}$
 - Typical amplitude in Vac. for photocathode
- Our Xenon lamp received, has not tried yet
- In discussion with Wenjie about the results next testing step



Xenon Lamp trigger

Anode

Cathode

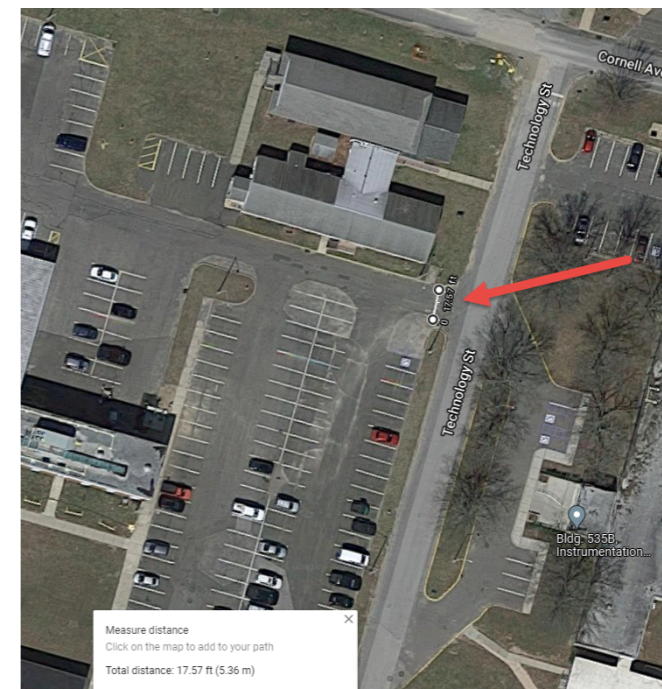


6000 LN2 Tank Commissioning

► Site Survey completed and approved by Airgas

• They can start to deliver the LN2 once the requirement modifications done

- 1) Add a 3 way valve on the Vent tree and install 2 new RDs and 2 new PRVs (Contacting the suggested vendor for parts)
 - 2) Replace the Top works of the Vent valve(In progress with CAD cryogenic team)
 - 3) Install Vent to Atmosphere and set at 40 psi(In progress with CAD cryogenic team)
 - 4) Rebuild the Top and Bottom Fill Valves (In progress with CAD cryogenic team)
 - 5) Replace the tank Low and High LL gauge 1/4" valves (In progress with CAD cryogenic team)
 - 6) Curb surface treatment: Put asphalt or gravel for the curb as the wheels will get on when turning(Reached out to safety and F&O)
- CAD can provide the insulation GORE-Tex materials, waiting for the confirmation of other parts
 - Site survey report sent to lab/dept safety, building manager, and F&O
 - Full Document uploaded to BNLI [Docdb #331-v1](#)



LArFCS Plan for the Purification Run

▸ **LArFCS plan until the end of CY 2021~12 weeks**

- **10/2-10/8:**
 - PrM test at UCI with Our Xenon Lamp in Vac.(TBD)
 - Mocking installation with the PrM mount with crane for the optimal flange angle
 - Plumbing modification for the purity run
- **10/11-10/15:**
 - Gas analyzer start-up test
 - PrM test at UCI in GAr(TBD)
 - Assembly of the gas panel
 - Plumbing for the gas analyzer readings from LArFCS
- **10/18-10/22:**
 - Plumbing for the gas sampling tubes
 - Plumbing for the activation gas to the LArFCS
- **10/25-10/29:**
 - Gas analyzer test with the hot getter
 - Insulation wrapping
- **11/01-11/05:**
 - Reactivation of the filter on system with gas analyzers monitoring

LArFCS Plan for the Purification Run

▸ LArFCS plan until the end of CY 2021~12 weeks

- 11/08-11/12:
 - PrM return from UCI(TBD)
 - Assembly of the PrM to LArFCS
 - Electronics bench test
- 11/15-11/19:
 - Assembly of the LArFCS for purity run
 - Pump-down. Leak check fixing
- 11/22-11/26:
 - Vacuum test of PrM in LArFCS
- 11/29-12/03:
 - Contingency for problem found in vacuum
 - PrM test in GAr
- 12/06-12/10:
 - LAr filling to LArFCS for purification run through inline filter
- 12/13-12/17:
 - PrM test in LAr(TBD)
- 12/20-12/24:
 - PrM test in LAr(TBD)
- 12/27-12/31:
 - TBD