

# 260-L LAr System Progress Report

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# Lab Safety

- COVID level in Suffolk County is still at HIGH and expected to be in the same level in the next weeks
- Please follow COVID protocol wearing face mask
- Watch out for the summer students and interns
- Take the additional trainings required for all employee Ethics and Privacy by 9/2; Active shooter training by 9/30

# Next Steps(From last week)

## ▶ List of studies

- Release some GAr— — — — —> Proceed, see late slides
- Heat the sampling tube— — — — —> Proceed, see late slides

## ▶ Filter regeneration

- The inline filter needs to be regenerated next— — — — —> Plumbing is done see late slides
- After inline filter, regenerate circulation purifier— — — — —> Will do after warming up

## ▶ Cryogenic operation

- Running for another week— — — — —> Will run to this Friday
- Baking the sampling tube— — — — —> Will do after warming up
- Refill with LAr through inline filter with residual LAr— — — — —> Not going to proceed this run
- Warm up— — — — —> Will run to this Friday
- Tubing baking system implementation— — — — —> Will do during inline filter activation
- Extend the heating tape coverage— — — — —> Will do during inline filter activation

## ▶ Analyzer flush system

- Modification to the gas panel— — — — —> Will do during inline filter activation

## ▶ Get the replacement parts

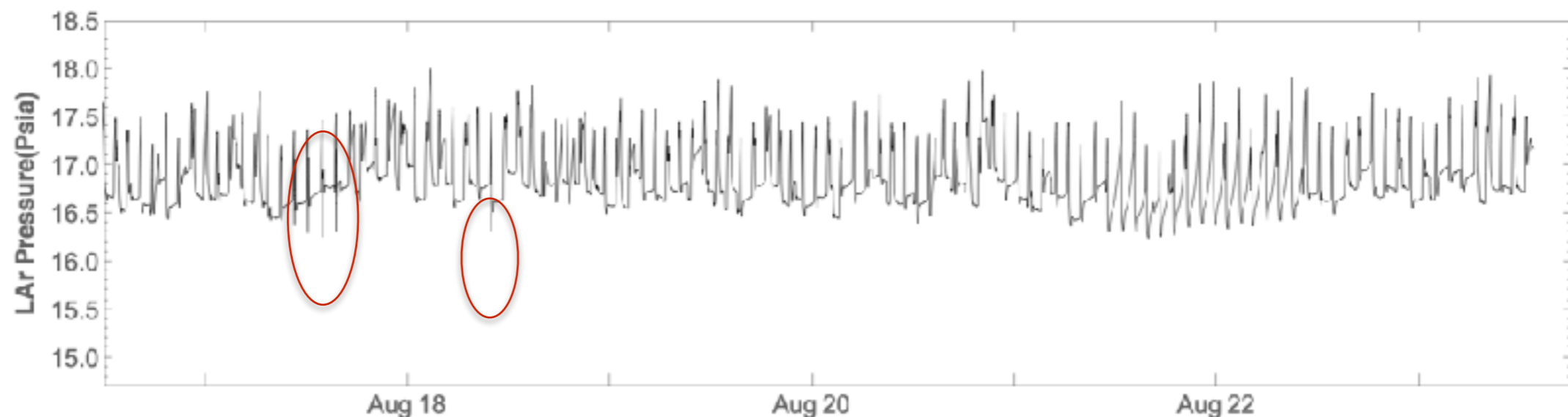
- New heater from KHV— — — — —> Ordered with KHV, dropped off the parts, lead time~ 1 week
- New diff-level gauge— — — — —> Ordered, ETA this week
- New or re-calibrate capacitance level gauge— — — — —> New identical cable ordered, ETA Thursday

## ▶ Revise operating procedures

## ▶ cryo pump?

# Venting the system

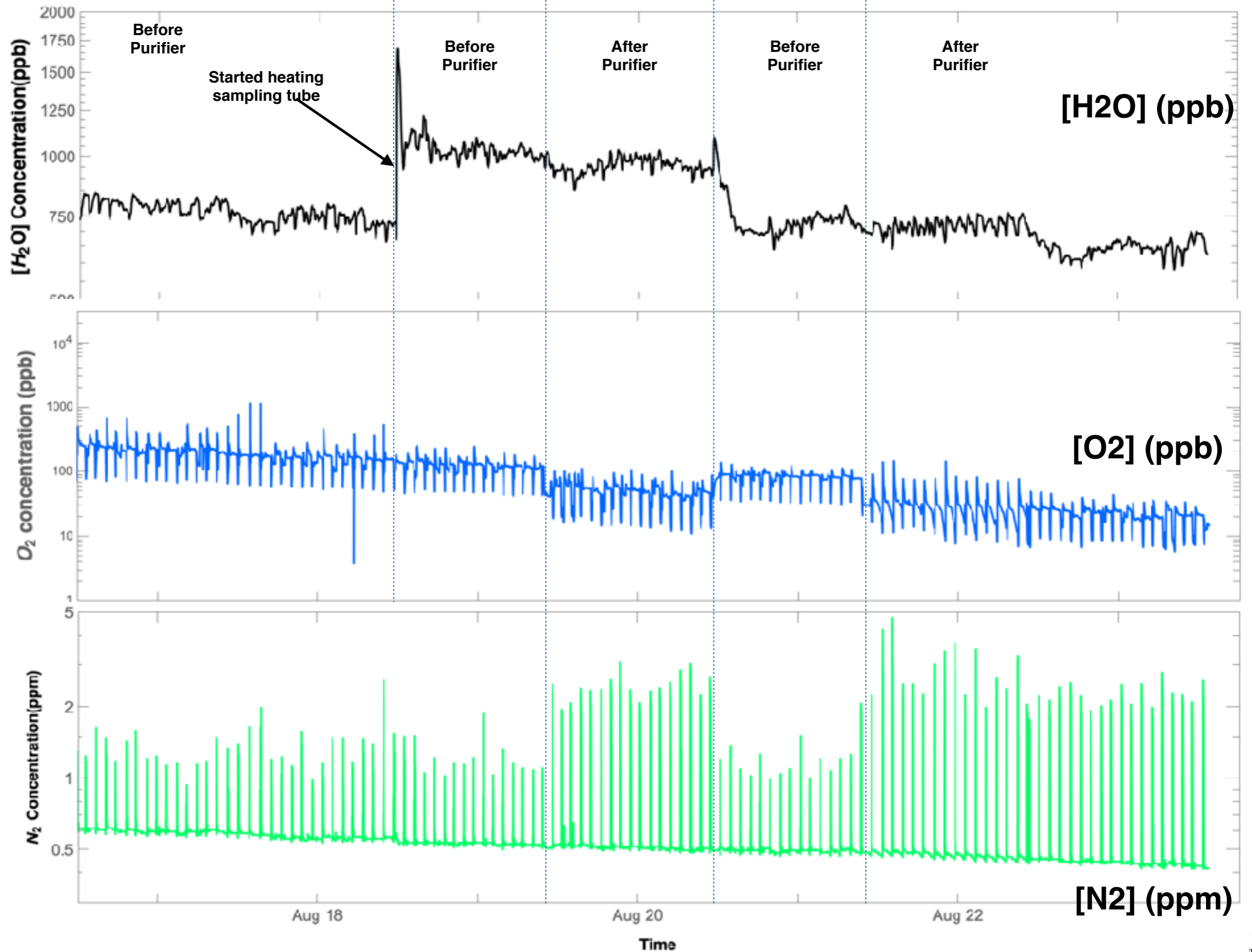
- ▶ **Release/Vent some gas from the system**
  - Venting from the top flange valve
  - Can't reduce to the atmosphere pressure to avoid air back flow
  - Vent with  $\sim 1$  psi pressure drop when the main dewar pressure at the maximum  $\sim 17.3$ psi, to  $\sim 16.3$  psi
  - 5 Release in total, 4 consecutive, 1 after over night
  - No obvious change in gas analyzer readings except for [N2] slight dropped



# Heating up the sampling tube

## ▶ Heating up the sampling tube

- Sampling tube from the gas panel outlets to the gas analyzer inlet to ~80C
- Heating is ON since then
- [H<sub>2</sub>O] readings spikes up with the heating and drops slowly
- [N<sub>2</sub>] and [O<sub>2</sub>] readings have minimum change



# Parts Replacements

## ▸ LAr Heater

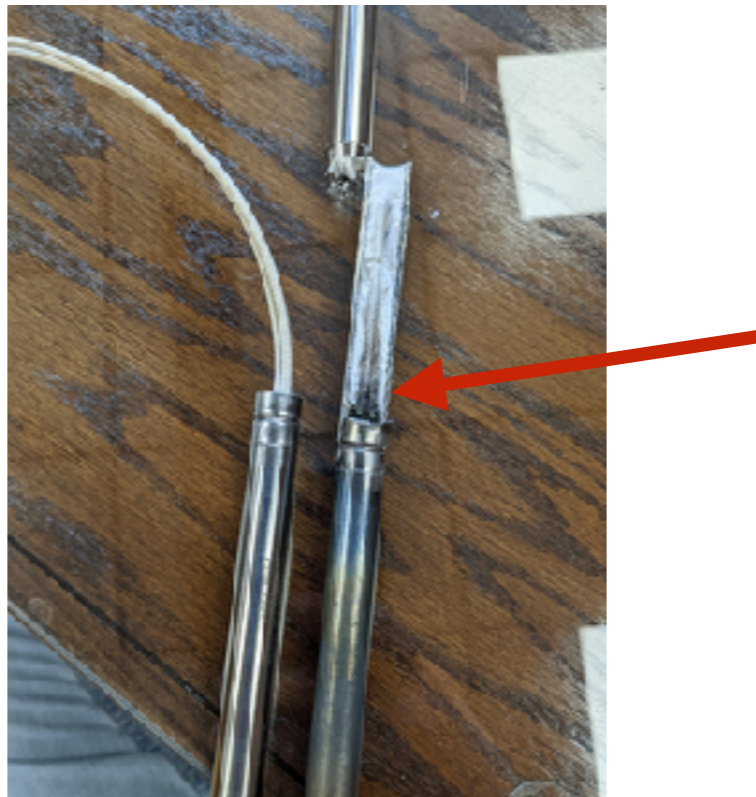
- Ordered with KHV, new heater dropped at the factory yesterday, waiting for quote, lead time ~ 1 week
- Will use mechanical connection (crimper) instead of soldering with reservation of the long lead

## ▸ LAr capacitance level gauge cable

- Consulted with the manufacturer AMI
- Advised the most time efficient way is to get an identical cable from the same source with the same length
- Ordered on Digikey, expected delivery on Thursday.

## ▸ LAr press-differential level gauge

- Identical unit ordered from Omega Engineering, expected next week



# Parts Replacements

## ▸ Vacuum pump

- Steve found two options of Pfeiffer HiCube pumps from replacement
- Both have equivalent or higher pumping power than the pump we have now
  - HiCube 80: pumping speed 33 l/s for N<sub>2</sub>, time for pumping 100L chamber: not specified, est. ~ 3 hrs
  - HiCube 300: pumping speed 260 l/s for N<sub>2</sub>, time for pumping 100L chamber: 1382 sec
- HiCube is the preferred option given the 260L of our system



**NEW Pfeiffer HiCube 80 Eco  
Benchtop Turbomolecular Pump  
Station KF40, MVP 015-2  
Diaphragm, PN: PM 015 888 AT**

Condition: **New** [Print Version](#)  
Part Number: **P107317**  
Warranty: **1-Year Limited Warranty**

**Out of Stock**

~~\$9,420.00~~

**On Sale: \$7,065.00**

Expecting: **6**  
Anticipated Arrival: **3 on 2022-09-23**

[Add To Cart](#)



**Pfeiffer HiCube 300 Eco  
Benchtop Turbomolecular Pump  
Station DN 100 CF, CF 6 Inlet.  
110-240 VAC PN: PM 025 020 AT**

Condition: **New** [Print Version](#)  
Part Number: **P1011627**  
Warranty: **Full Manufacturer's Warranty**

**Out of Stock**

~~\$14,283.00~~

**On Sale: \$9,998.10**

Expecting: **2**  
Anticipated Arrival: **2 on 2022-09-23**

[Add To Cart](#)

# Next steps

- **Cryogenic System running to this Friday**
  - LAr level is pretty low now, below the 2nd RTD, only first RTD immersed
  - LAr left from the fill is not enough to refill
  - Try to sample from the liquid tube
- **Activation the inline filter**
  - Estimated activation time is ~24-36 hours
  - Will follow the procedure with flow rate and hot spot movement
- **Opening up the dewar**
  - Cleaning up the inner surfaces
  - Install the replacement parts
    - Heater tube
    - Press-diff level gauge
- **Preparation for the next fill**
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