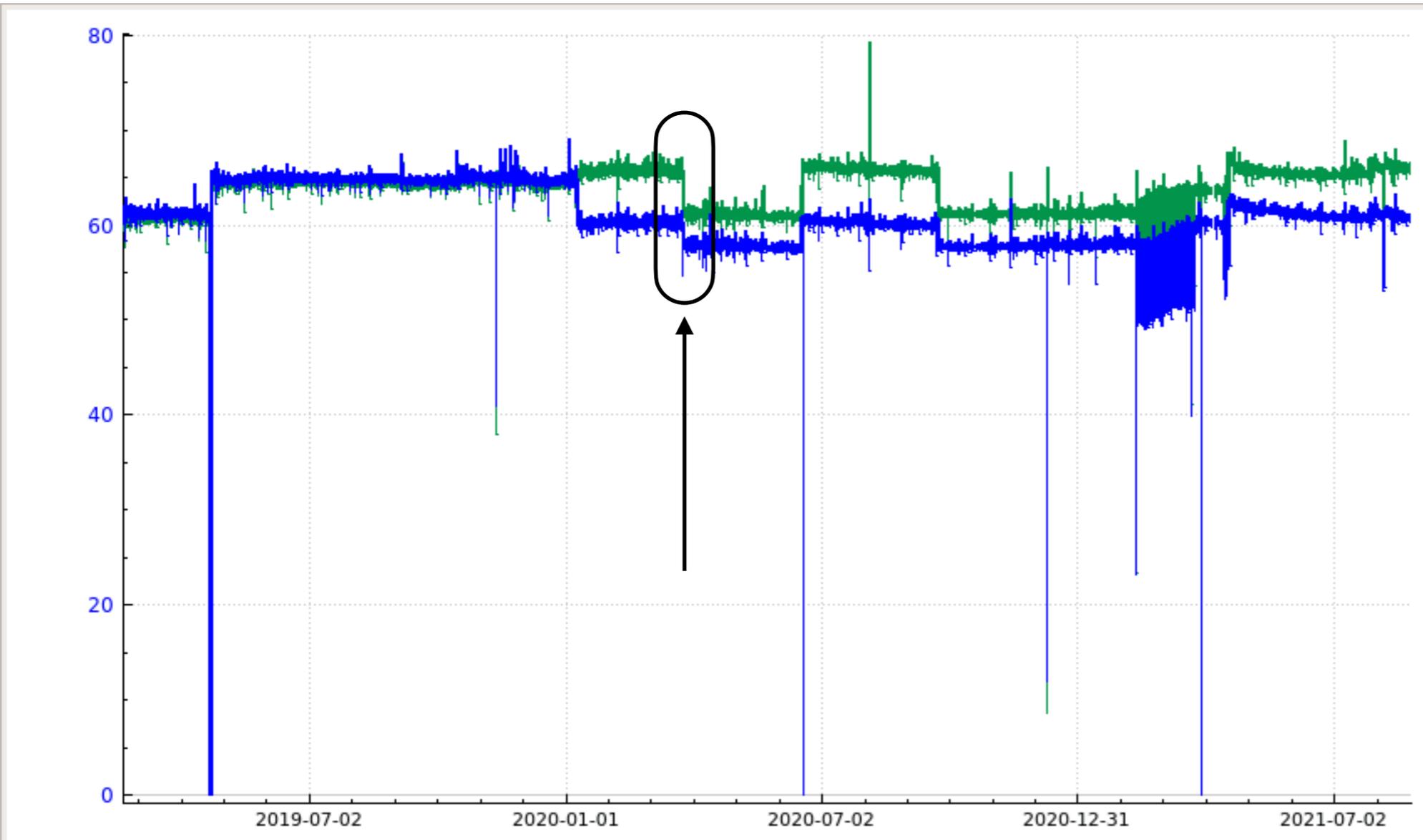


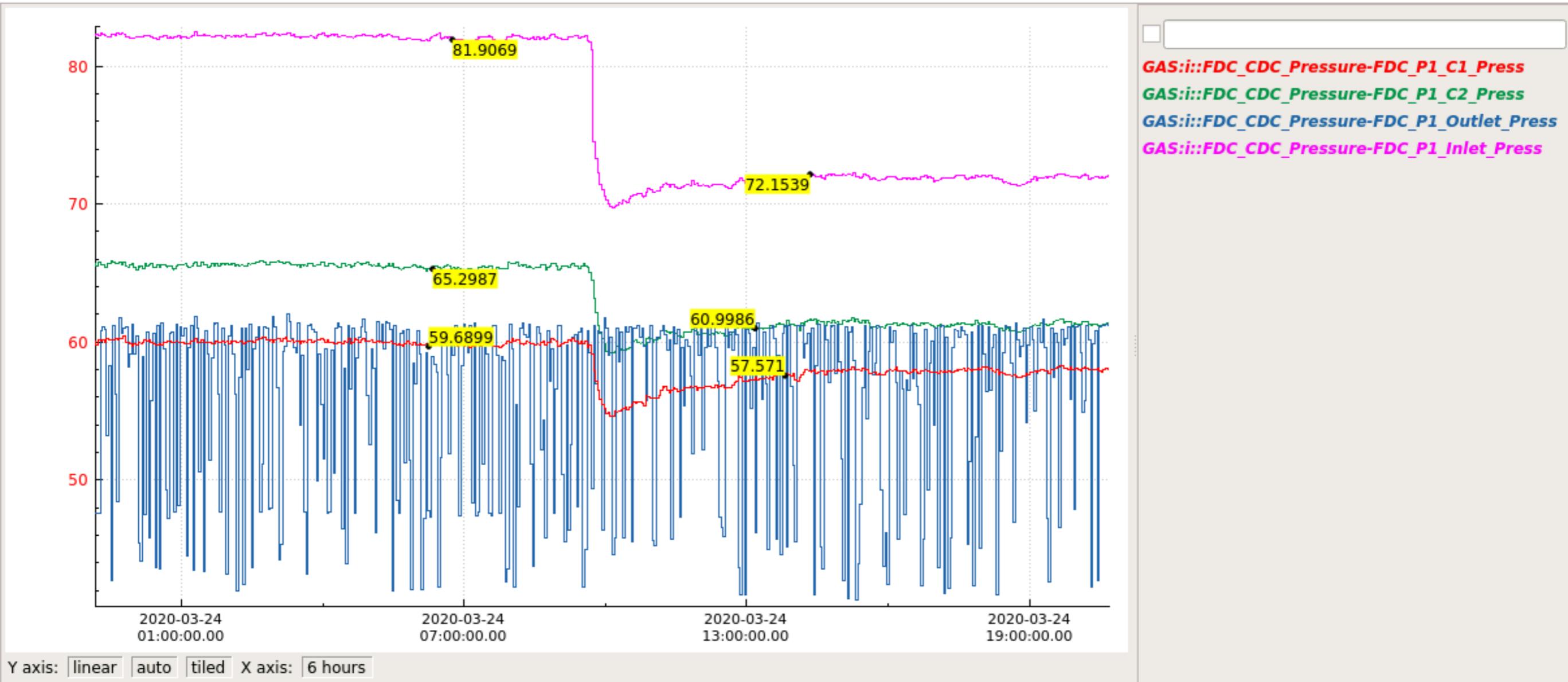
# FDC1 Cell1 gas issue



- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C1\_Press*
- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C2\_Press*
- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C3\_Press*
- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C4\_Press*
- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C5\_Press*
- GAS:i::FDC\_CDC\_Pressure-FDC\_P1\_C6\_Press*

Y axis: linear auto tiled X axis: 183 days

# FDC1 Cell1 gas issue



$$(p_{c2} - p_{c1}) = R \cdot Flow$$

$$R = \frac{65.30 - 59.69 \text{ Pa}}{100 \text{ ccpm}} = 0.0561$$

$$R = \frac{61.00 - 57.57 \text{ Pa}}{60 \text{ ccpm}} = 0.0572$$

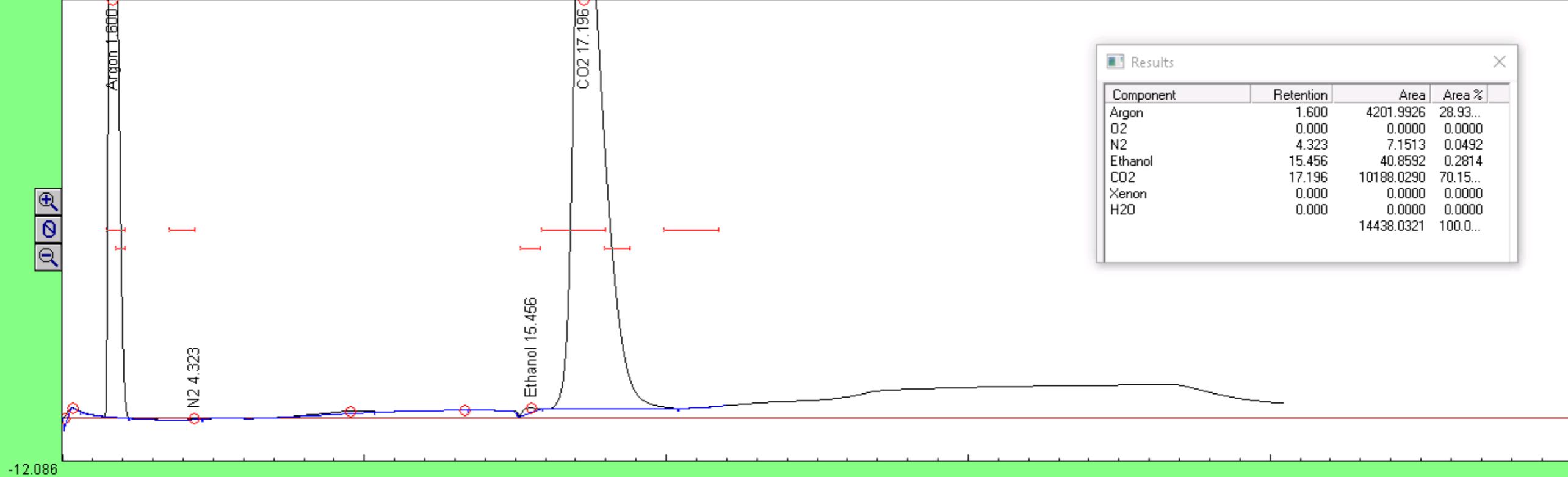
# FDC1 gas analysis - 9/9/2021

Peaksimple - PeakSimple

File Edit View Acquisition Help

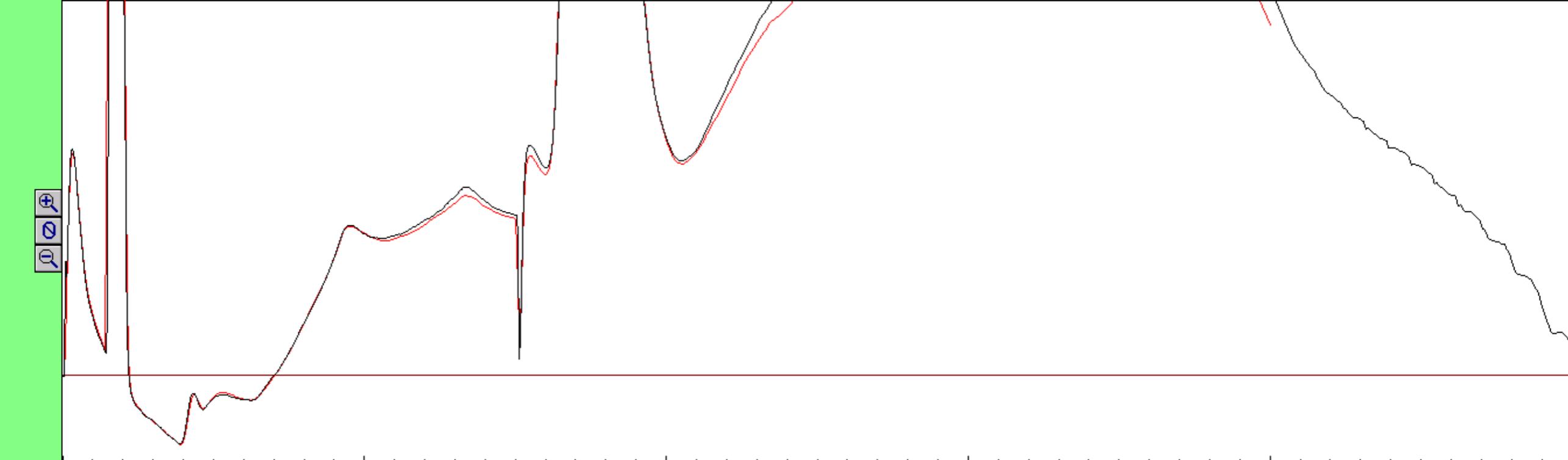
1 2 3 4 5 6 81 82 83 84

RUN1 TCD Low current 230.70 deg 40.46 min  
114.906 c:\peak484-64bit\win10\cdc\_Argon\_4456.CHR/CDC.CON RUNNING 3.892 mV



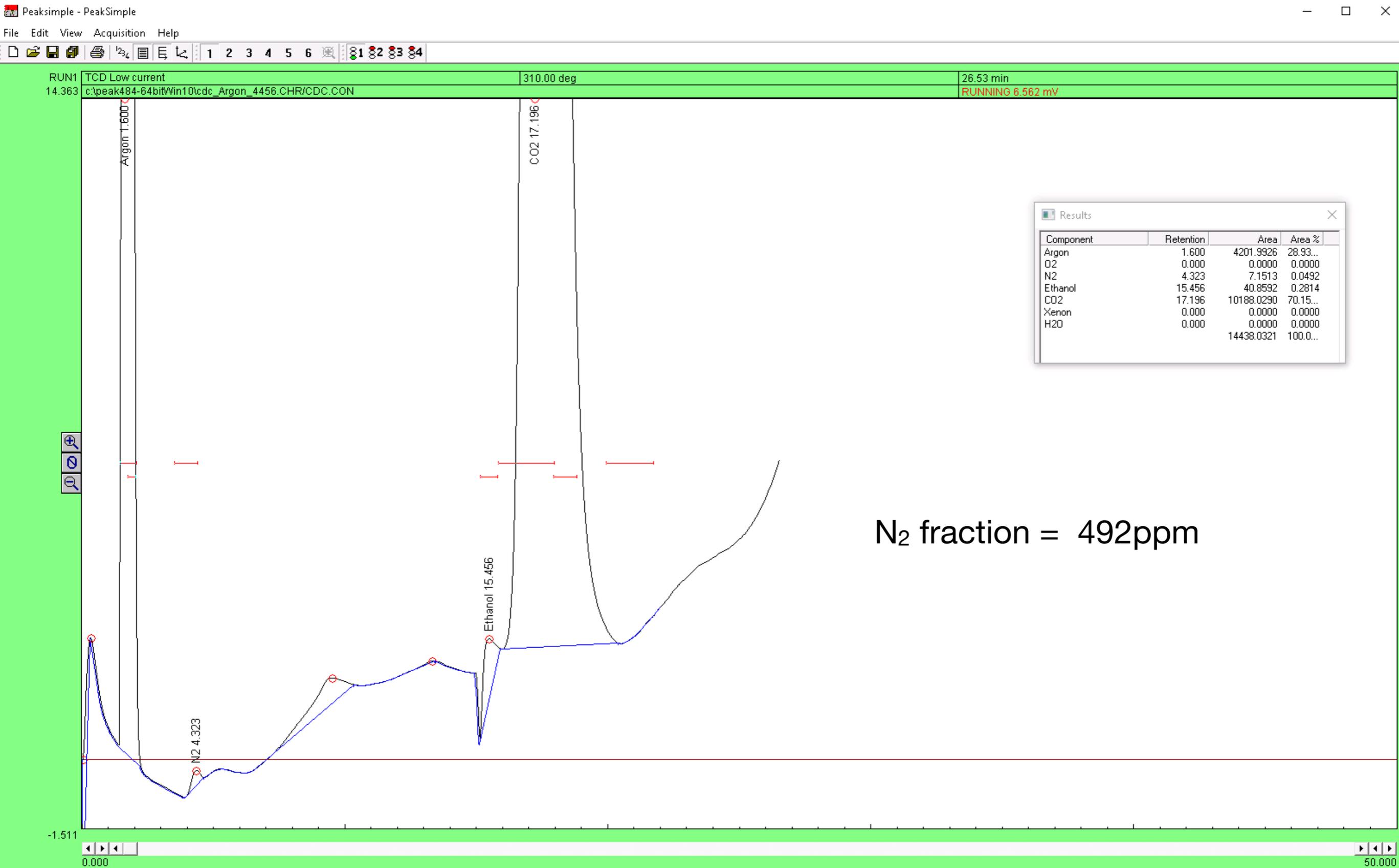
Component	Retention	Area	Area %
Argon	1.600	4201.9926	28.93...
O2	0.000	0.0000	0.0000
N2	4.323	7.1513	0.0492
Ethanol	15.456	40.8592	0.2814
CO2	17.196	10188.0290	70.15...
Xenon	0.000	0.0000	0.0000
H2O	0.000	0.0000	0.0000
		14438.0321	100.0...

RUN1 TCD Low current  
4.470 c:\peak484-64bit\win10\cdc\_Argon\_4447.CHR/CDC.CON



0.000 50.000

# FDC1 gas analysis - 9/9/2021



# FDC1 gas analysis -8/6/2021

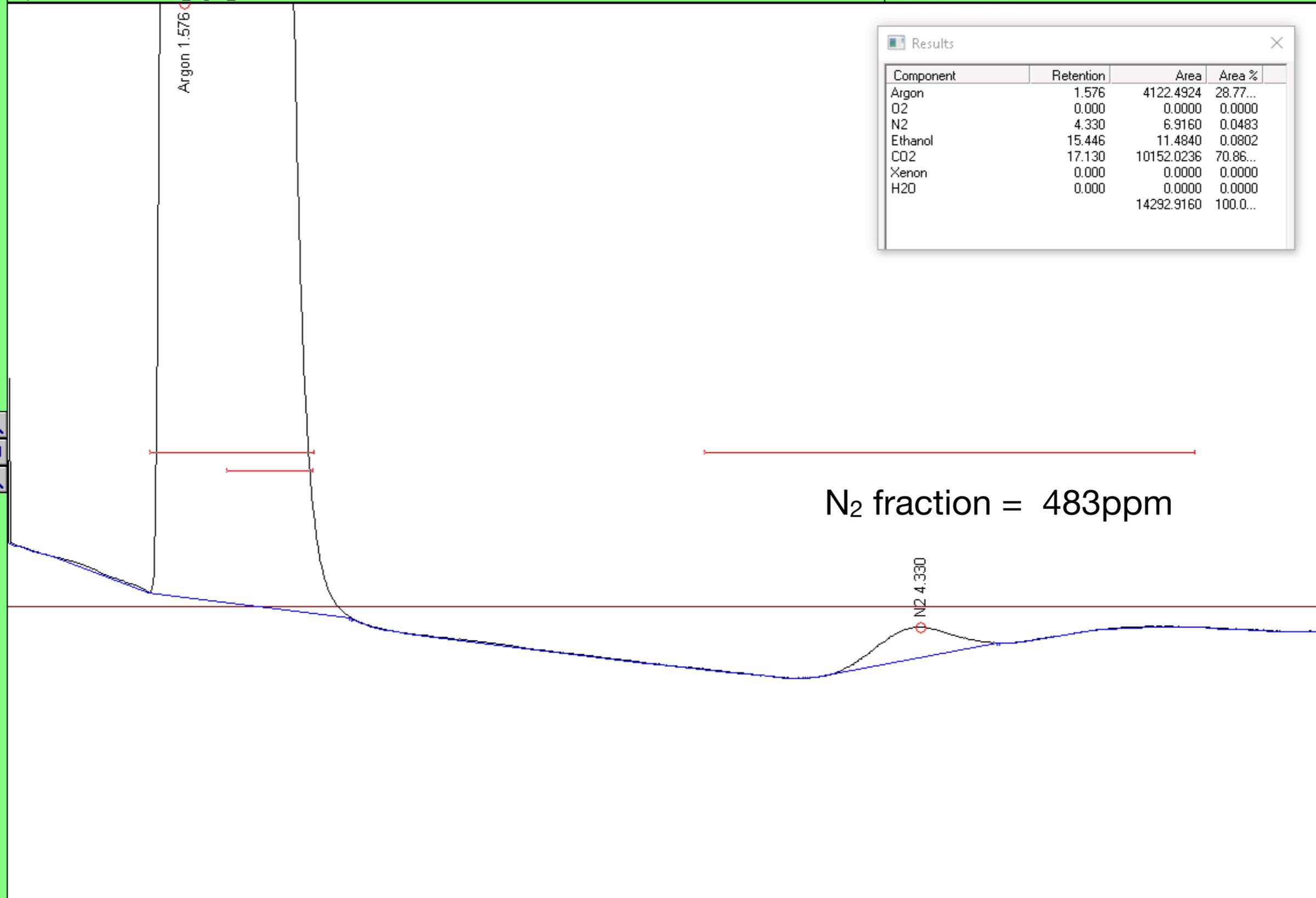
Peaksimple - PeakSimple

File Edit View Acquisition Help

1 2 3 4 5 6 81 82 83 84

RUN1 TCD Low current 229.80 deg 40.51 min  
6.847 c:\peak484-64bit\Win10\cdc\_Argon\_3725.CHR/CDC.CON RUNNING 3.294 mV

Component	Retention	Area	Area %
Argon	1.576	4122.4924	28.77...
O2	0.000	0.0000	0.0000
N2	4.330	6.9160	0.0483
Ethanol	15.446	11.4840	0.0802
CO2	17.130	10152.0236	70.86...
Xenon	0.000	0.0000	0.0000
H2O	0.000	0.0000	0.0000
		14292.9160	100.0...



-3.357

Navigation icons: back, forward, search, etc.

Navigation icons: back, forward, search, etc.

# FDC2 gas analysis -8/6/2021

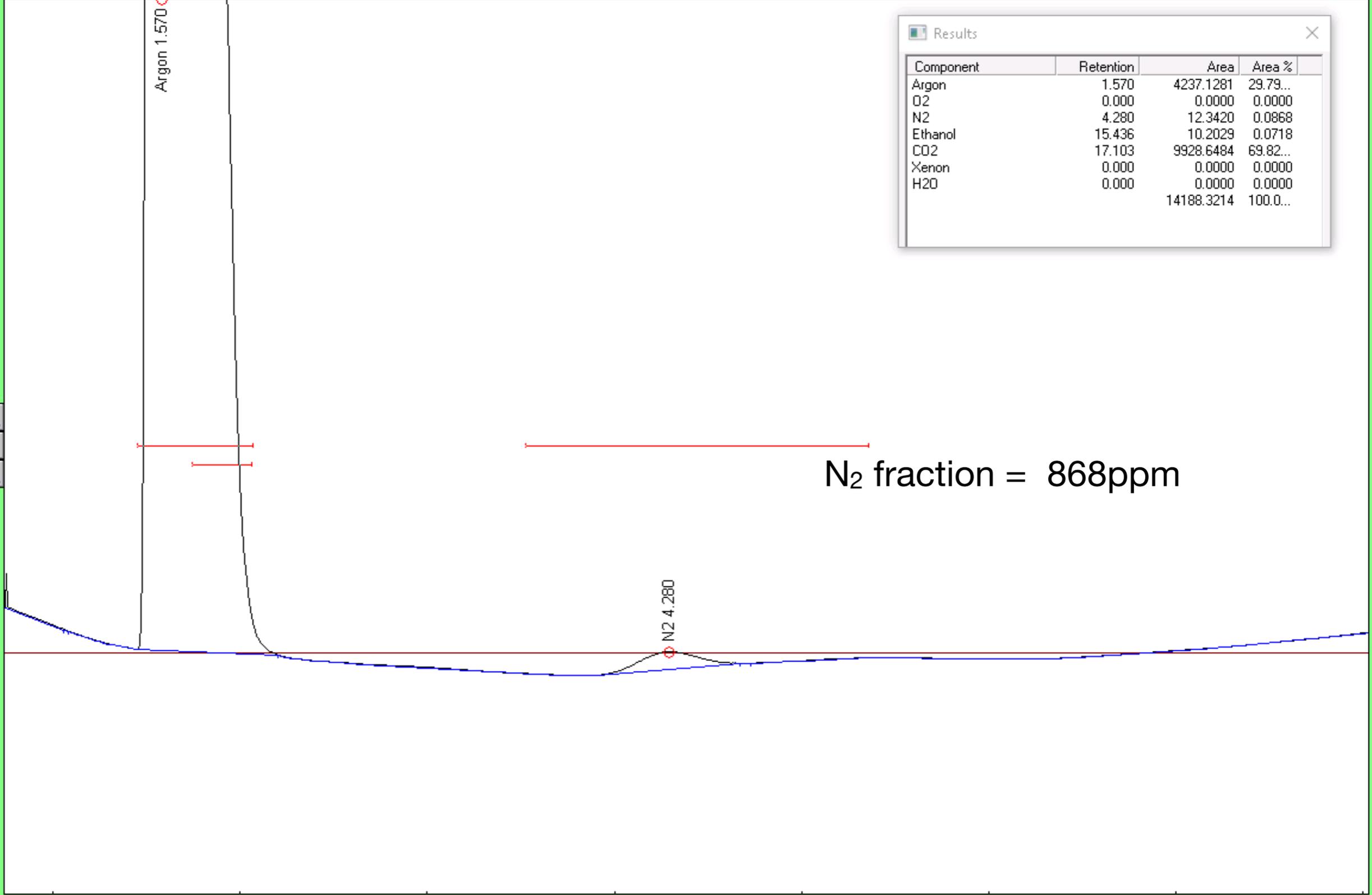
PeakSimple - PeakSimple

File Edit View Acquisition Help

1 2 3 4 5 6 81 82 83 84

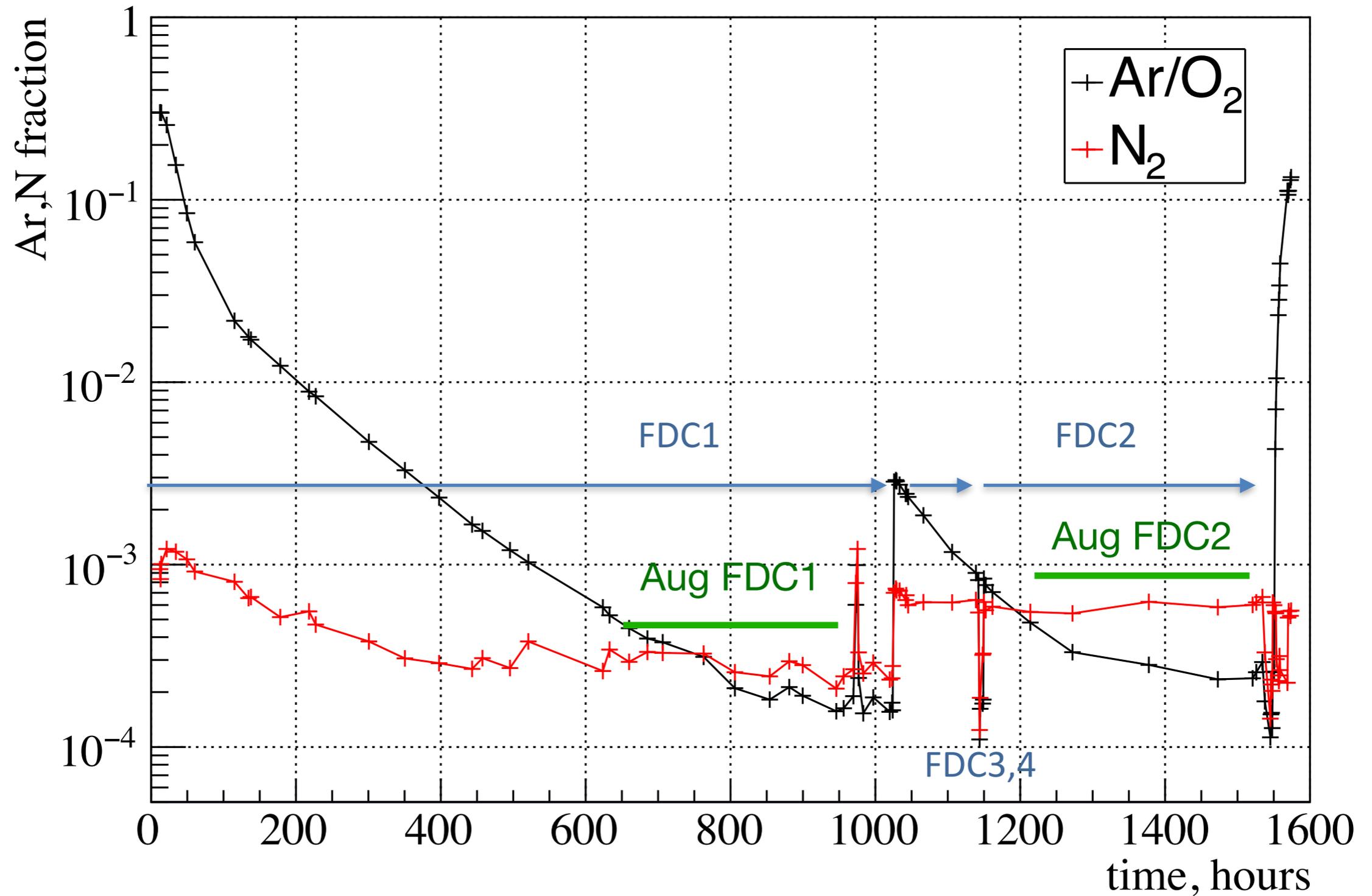
RUN1 TCD Low current 220.62 deg 40.97 min  
21.808 c:\peak484-64bit\Win10\cdc\_Argon\_3758.CHR/CDC.CON RUNNING 3.242 mV

Component	Retention	Area	Area %
Argon	1.570	4237.1281	29.79...
O2	0.000	0.0000	0.0000
N2	4.280	12.3420	0.0868
Ethanol	15.436	10.2029	0.0718
CO2	17.103	9928.6484	69.82...
Xenon	0.000	0.0000	0.0000
H2O	0.000	0.0000	0.0000
		14188.3214	100.0...

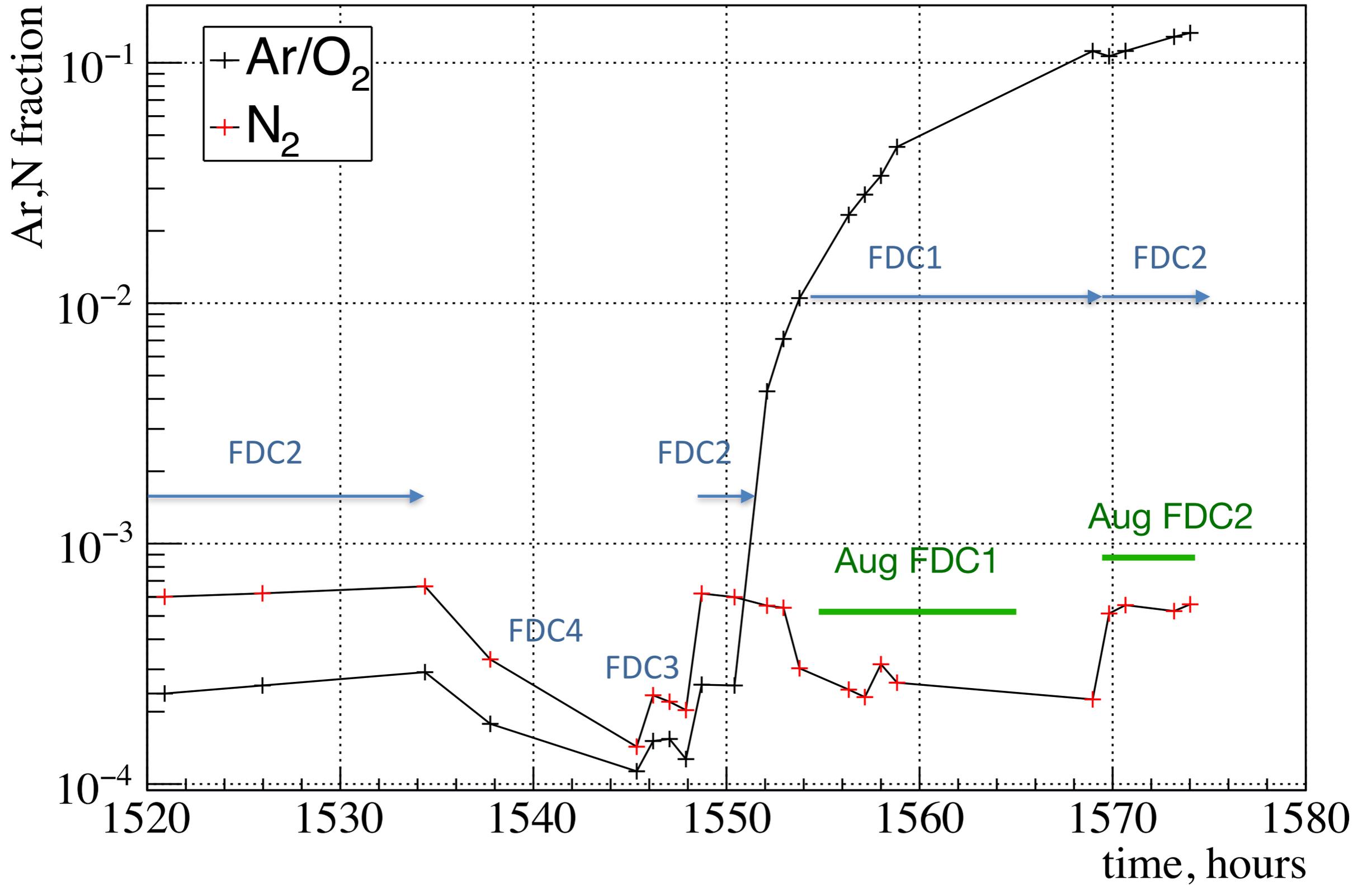


N<sub>2</sub> fraction = 868ppm

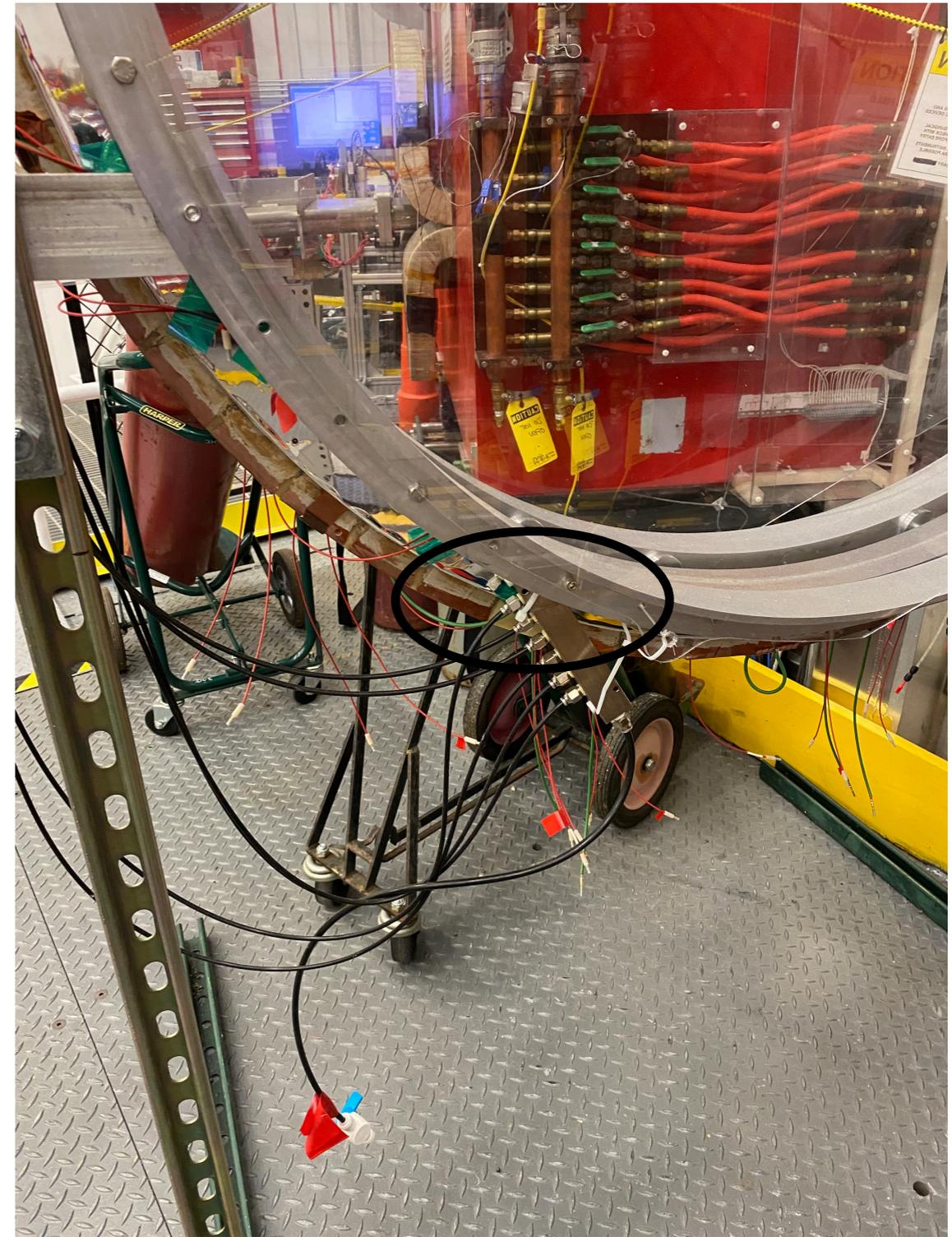
# FDC gas tests - March 2021



# FDC gas tests - April 2021



# FDC1 Cell1 - action plan

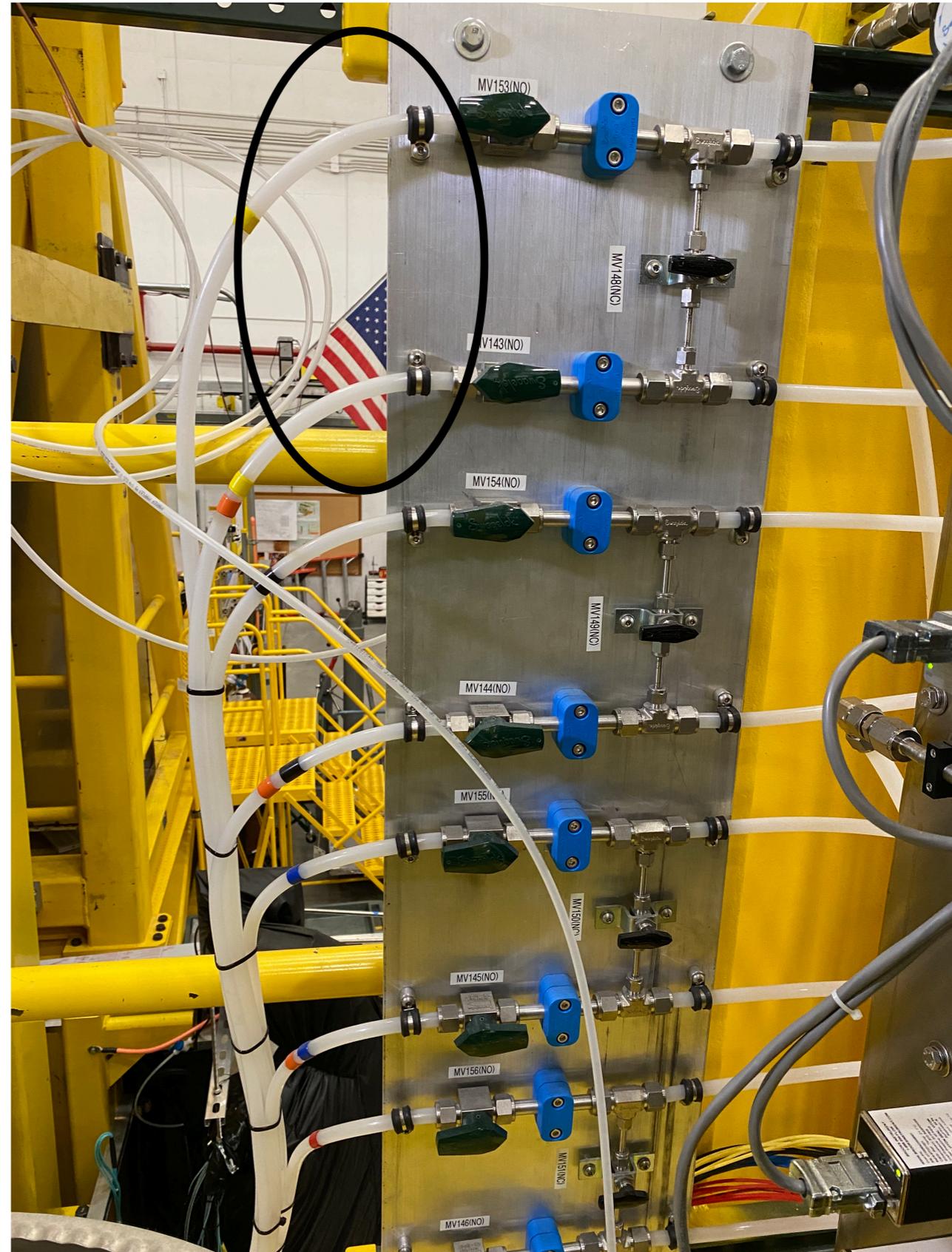


- Install needle valve and close it till we get 5Pa c2-c1 difference
- Reverse flow and see what is the pressure in c1 depending on flow

# FDC1 Cell1 - action plan

Design and install a system of valves to swap the input and output tubes

Discussing with Tim - other options - install a pump at the input (now) tube and open the output - under-pressure more dangerous



# FDC1 Cell1 - action plan



**Last resort:** if noting works we can use the gauge tubes as exhaust  
Need delicate pressure balance

# FDC gas problem- longterm plan

- The gas input into the cells has nine 1mm holes in the spacer ring at both supply and exhaust side - easy to clog
- If the MFCs are the source of the particulates that clogs the gas system:
  - replace MFCs with rotameters?
  - look for better MFCs?
- Depending on the results we may want to reverse the flow also to the other packages?