

Report

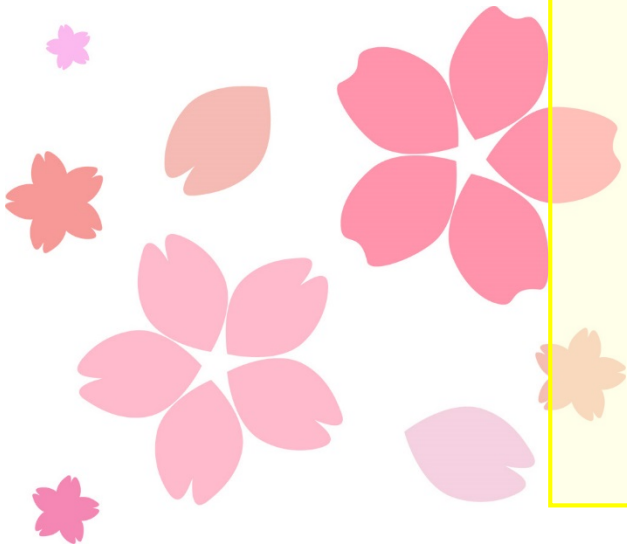
Aiko SHOJI (Iwate University)

LCTPC Asia group meeting

Content:

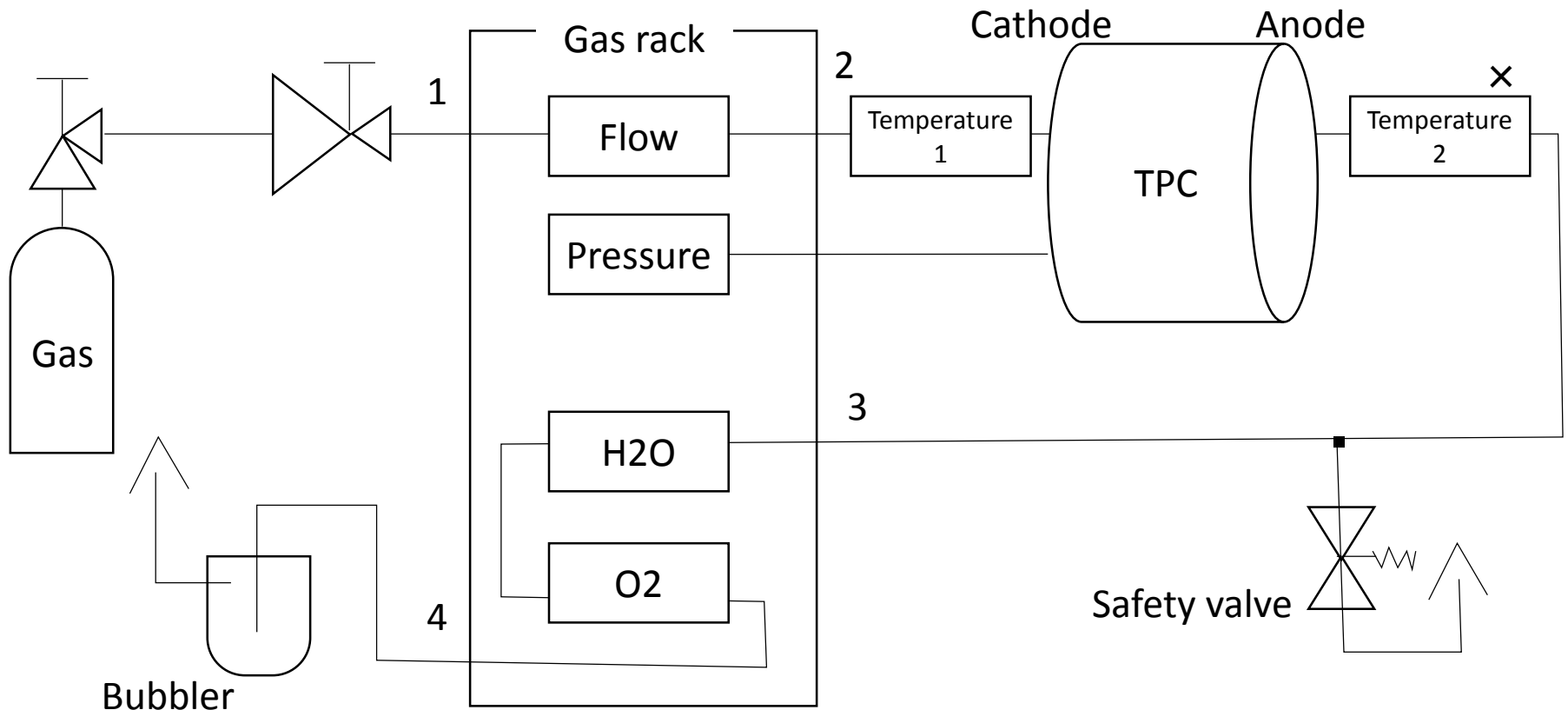
- Make a datasheet
→ Data processing of H₂O

20th April 2017



Question to Oliver-san

- Why is there a difference in the number of measurement points?
----I do not know. Although it should be measured when there is a change ...
- Why is O2 high?
---- Safety valve is loose, possibility that O2 enters from there
- Valve and sensor position?



H₂O [ppm]

w/ Gating GEM

The data for each run was taken as the average value obtained from the recorded data in the vicinity of the time from the start of the run to the start of the next run.

Monitor data

Time	H2O[ppm]	
21:37	69.38262	a
21:46	70.39326	b
21:50	69.38262	c
21:52	70.39326	d
22:08	69.38262	e
22:13	70.39326	f
23:41	54.93362	g
23:42	53.93134	h
23:42	52.75097	i
23:43	51.59457	j
23:43	50.4617	k
23:44	49.35191	l
23:45	48.26477	m
23:45	47.19987	n
23:47	46.15677	o
23:48	45.13507	p
23:51	46.32912	q
23:52	47.37583	r

About
1.5h
blank

Data for each run (calculation)

Run number	Start time	H2O[ppm]	←calculate
19972	21:37	69.88794	Average(a,b)
19973	21:45	70.05638	Average(b,c,d)
19974	21:53	69.88794	Average(d,e)
19975	22:01	69.88794	Average(d,e)
19976	22:10	69.88794	Average(e,f)
19977	22:19	no	
19978	22:27	no	
19979	22:35	no	
19980	22:44	no	
19981	22:52	no	
19982	23:00	no	
19983	23:08	no	
19984	23:16	no	
19985	23:25	no	
19986	23:33	no	
19987	23:42	49.64634	Average(g,h,~,q)
19988	23:52	46.28001	Average(p,q,r)

H₂O [ppm]

w/ FS

Monitor data

Time	H2O[ppm]	
13:43	131.9269	A
14:09	130.5693	B
14:12	131.9269	C
14:15	130.5693	D
14:24	131.9269	E
14:32	130.5693	F
14:48	131.9269	G
14:54	130.5693	H
15:12	131.9269	I
15:17	130.5693	J
15:45	131.9269	K
15:48	130.5693	L

About
30 min
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Data for each run (calculation)

Run number	Start time	H2O[ppm]	←calculate
20041	13:46	131.2481	Average(A,B)
20042	13:52	131.2481	Average(A,B)
20043	14:00	131.2481	Average(A,B)
20044	14:07	131.2481	Average(B,C)
20045	14:14	131.2481	Average(D,E)
20046	14:21	131.2481	Average(D,E)
20047	14:28	131.2481	Average(E,F)
20048	14:35	131.2481	Average(F,G)
20049	14:43	131.2481	Average(G,H)
20050	14:51	131.2481	Average(H,I)
20051	15:01	131.2481	Average(H,I)
20052	15:08	131.2481	Average(H,I)
20053	15:16	130.5693	J
20054	15:24	no	
20055	15:32	no	
20056	15:39	no	
20057	15:46	131.2481	Average(K,L)

Making of data sheet for beam test analysis

Beam test data sheet 2016 LCTPC Asia group

Zscan recomded data set

position adjusted to escape dead channel

Date. 7th November 2016

Drift length z [mm]	12.5	25	50	75	100	125	150	200	250	300	350	400	450	500	550
Run number	19987	19985	19984	19983	19982	19981	19980	19979	19978	19977	19976	19975	19974	19973	19972
Pressure [hPa]	1008.71	1008.78	1008.81	1008.84	1008.87	1008.9	1008.93	1008.96	1008.99	1009.02	1009.05	1009.08	1009.11	1009.14	1009.2
Temperature [°C]	18.2	18.19	18.19	18.19	18.19	18.19	18.18	18.18	18.18	18.18	18.18	18.18	18.17	18.17	18.17
Temperature [K]	291.2	291.19	291.19	291.19	291.19	291.19	291.18	291.18	291.18	291.18	291.18	291.18	291.17	291.17	291.17
H ₂ O [ppm]	49.6463	-	-	-	-	-	-	-	-	-	69.8879	69.8879	69.8879	70.0564	69.8879
O ₂ [ppm]	56.2439	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Start time [hh:mm]	23:42	23:25	23:16	23:08	23:00	22:52	22:44	22:35	22:27	22:19	22:10	22:01	21:53	21:45	21:37
Start time [days]	12.988	12.976	12.969	12.964	12.958	12.953	12.947	12.941	12.935	12.93	12.924	12.918	12.912	12.906	12.901

Magnetic field B [T]	1
Phi ϕ [degree]	0(1.6)
Theta θ [degree]	0
Module number	3
Mount module	gate
V _{gate} [V]	3.55
V _{GEM(cathode side)} [V]	355
V _{GEM(anode side)} [V]	315
V _{GEMAA} [V]	540
V _{GEMAC} [V]	855
V _{GEMCA} [V]	1210
V _{GEMCC} [V]	1565
V _G [V]	1968
V _{cathode} [V]	14845
V _{7thstrip} [V]	1781
V _{dammy} [V]	1781
E _{drift} [V/cm]	230
E _{transfer} [V/cm]	887.5
E _{induction} [V/cm]	2700

ΔV

ΔV

ΔV

Preliminary

Making of data sheet for beam test analysis

Beam test data sheet 2016 LCTPC Asia group

Zscan recomeded data set

Date. 10th November 2016

Drift length z [mm]	12.5	25	50	75	100	125	150	200	250	300	350	400	450	500	550
Run number	20041	20042	20043	20044	20045	20046	20047	20048	20049	20050	20051	20052	20053	20054	20055
Pressure [hPa]	1004.74	1004.81	1004.89	1004.96	1005.04	1005.11	1005.19	1005.26	1005.35	1005.45	1005.54	1005.61	1005.70	1005.78	1005.85
Temperature [°C]	17.49	17.50	17.51	17.52	17.52	17.53	17.54	17.55	17.56	17.57	17.57	17.58	17.59	17.60	17.61
Temperature [K]	290.49	290.5	290.51	290.52	290.52	290.53	290.54	290.55	290.56	290.57	290.57	290.58	290.59	290.6	290.61
H ₂ O [ppm]	131.248	131.248	131.248	131.248	131.248	131.248	131.248	131.248	131.248	131.248	131.248	131.248	130.569	-	-
O ₂ [ppm]	-	67.4744	-	-	-	-	-	-	-	-	-	-	-	-	-
Start time [hh:mm]	13:46	13:52	14:00	14:07	14:14	14:21	14:28	14:35	14:43	14:51	15:01	15:08	15:16	15:24	15:32
Start time [days]	15.574	15.578	15.583	15.588	15.593	15.598	15.603	15.608	15.613	15.619	15.626	15.631	15.636	15.642	15.647

Magnetic field B [T]	1
Phi ϕ [degree]	0
Theta θ [degree]	1.3
Module number	3
Mount module	FS
V _{GEM(cathode side)} [V]	355
V _{GEM(anode side)} [V]	315
V _{GEMAA} [V]	540
V _{GEMAC} [V]	855
V _{GEMCA} [V]	1210
V _{GEMCC} [V]	1565
V _{field A} [V]	1641
V _{field C} [V]	1781
V _{cathode} [V]	14850
V _{7thstrip} [V]	1781
V _{dammy} [V]	1781
E _{drift} [V/cm]	230
E _{transfer} [V/cm]	887.5
E _{induction} [V/cm]	2700

 ΔV ΔV

Preliminary

Next step

- I will make the data sheet by deriving the environmental data for each Run as in the previous slide

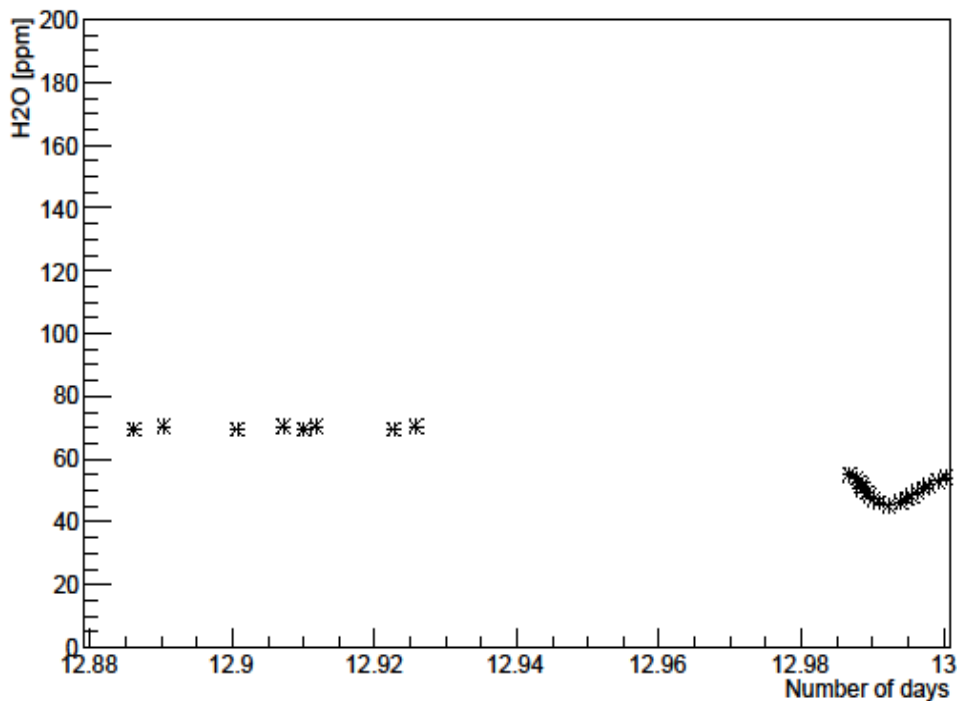
Thank you for your attention!



in Morioka

H₂O [ppm] w/ Gating GEM

H2O(Gate GEM_07. Nov. 2016)

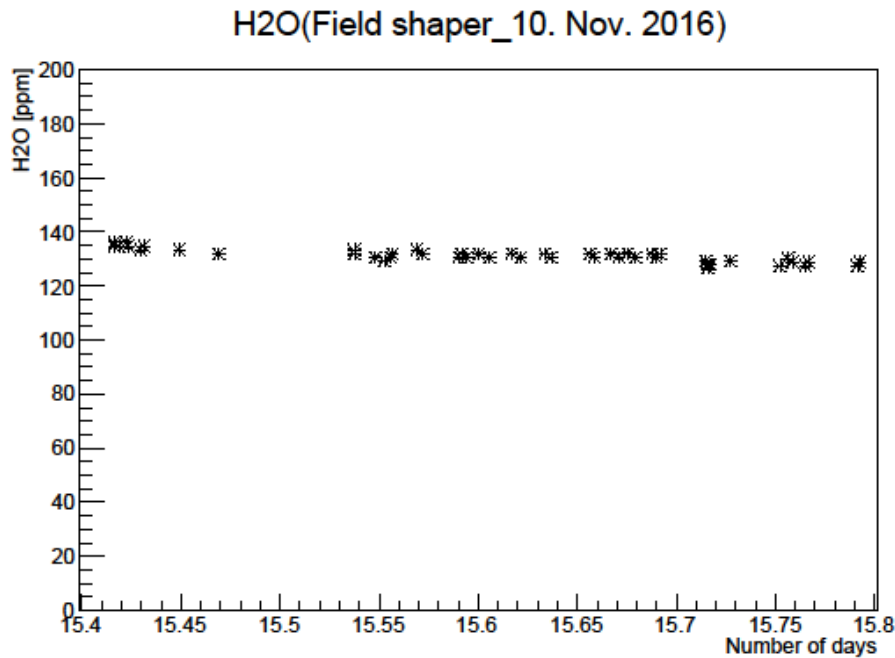


Average about 56.16 ppm

Measurement time
21:37~23:52
(12.901~12.994 [days])

"07. Nov. 2016 21:22:05.158 0"	70.39326
"07. Nov. 2016 21:37:06.522 0"	69.38262
"07. Nov. 2016 21:46:20.743 0"	70.39326
"07. Nov. 2016 21:50:31.844 0"	69.38262
"07. Nov. 2016 21:52:59.903 0"	70.39326
"07. Nov. 2016 22:08:45.291 0"	69.38262
"07. Nov. 2016 22:13:16.396 0"	70.39326
"07. Nov. 2016 23:41:02.519 0"	54.933624
"07. Nov. 2016 23:42:27.556 0"	53.931343
"07. Nov. 2016 23:42:56.567 0"	52.750973
"07. Nov. 2016 23:43:22.582 0"	51.594574
"07. Nov. 2016 23:43:50.594 0"	50.4617
"07. Nov. 2016 23:44:27.607 0"	49.351913
"07. Nov. 2016 23:45:05.622 0"	48.264774
"07. Nov. 2016 23:45:49.639 0"	47.199867
"07. Nov. 2016 23:47:03.669 0"	46.15677
"07. Nov. 2016 23:48:55.723 0"	45.135067
"07. Nov. 2016 23:51:27.783 0"	46.32912
"07. Nov. 2016 23:52:38.812 0"	47.375828
"07. Nov. 2016 23:53:43.838 0"	48.444412
"07. Nov. 2016 23:54:46.863 0"	49.535294
"07. Nov. 2016 23:55:57.893 0"	50.6489
"07. Nov. 2016 23:57:07.920 0"	51.78566
"07. Nov. 2016 23:58:52.962 0"	52.946022

H₂O [ppm] w/ FS



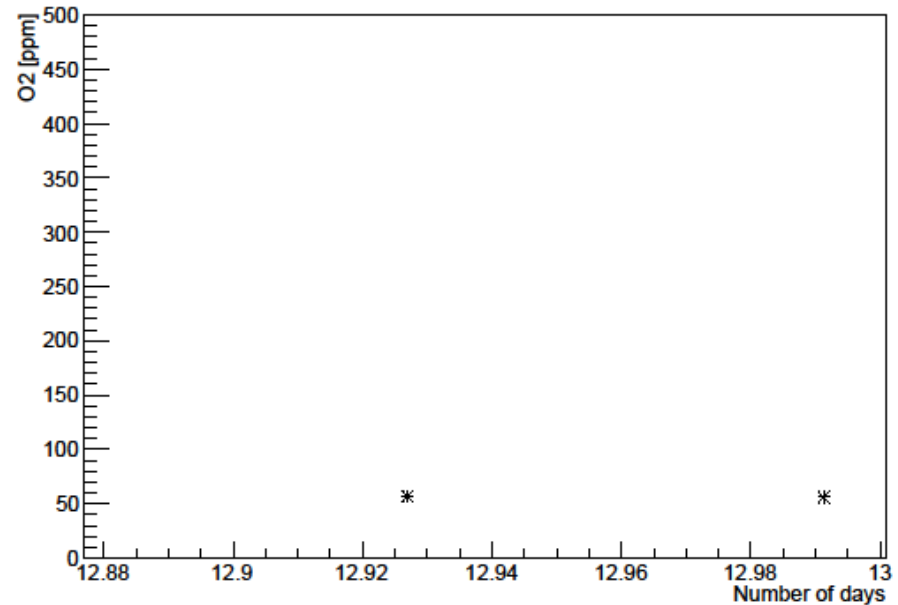
```

"10. Nov. 2016 13:39:18.694 0" 133.29745
"10. Nov. 2016 13:43:52.853 0" 131.92686
"10. Nov. 2016 14:09:59.658 0" 130.56929
"10. Nov. 2016 14:12:18.751 0" 131.92686
"10. Nov. 2016 14:15:35.869 0" 130.56929
"10. Nov. 2016 14:24:21.173 0" 131.92686
"10. Nov. 2016 14:32:23.373 0" 130.56929
"10. Nov. 2016 14:48:19.791 0" 131.92686
"10. Nov. 2016 14:54:54.023 0" 130.56929
"10. Nov. 2016 15:12:25.578 0" 131.92686
"10. Nov. 2016 15:17:12.703 0" 130.56929
"10. Nov. 2016 15:45:33.487 0" 131.92686
"10. Nov. 2016 15:48:31.559 0" 130.56929
"10. Nov. 2016 16:00:26.879 0" 131.92686

```

Measurement time
 13:46~15:39
 (15.574~15.652 [days])

O2(Gate GEM_07. Nov. 2016)

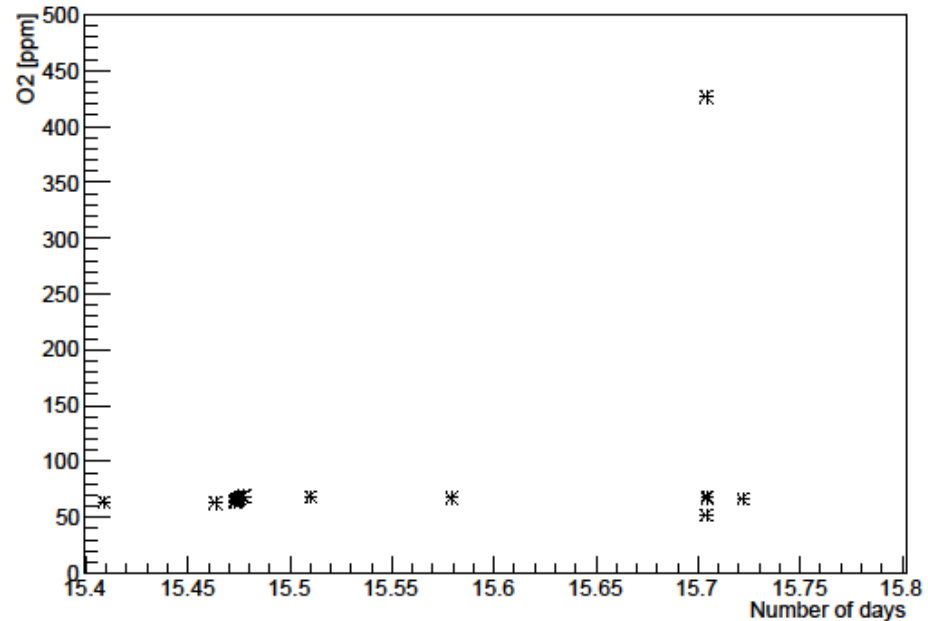


- There are few data points.

"07. Nov. 2016 18:08:06.000"	1478538486	56.82373	0
"07. Nov. 2016 18:47:36.000"	1478540856	57.434082	0
"07. Nov. 2016 18:56:56.000"	1478541416	56.854248	0
"07. Nov. 2016 19:04:56.000"	1478541896	56.243896	0
"07. Nov. 2016 22:14:47.000"	1478553287	56.82373	0
"07. Nov. 2016 23:47:27.000"	1478558847	56.243896	0
"08. Nov. 2016 00:02:07.000"	1478559727	56.82373	0
"08. Nov. 2016 00:23:07.000"	1478560987	56.243896	0
"08. Nov. 2016 00:47:27.000"	1478562447	56.82373	0

Measurement time
21:37~23:52
(12.901~12.994 [days])

O2(Field shaper_10. Nov. 2016)



- There are few data points.

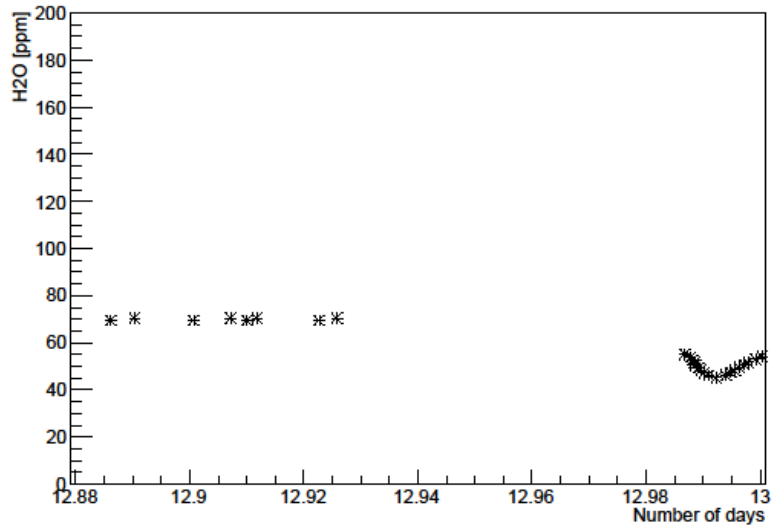
```
"10. Nov. 2016 11:27:47.000" 1478773667 68.90869 0
"10. Nov. 2016 12:14:37.000" 1478776477 68.20679 0
"10. Nov. 2016 13:54:08.000" 1478782448 67.474365 0
"10. Nov. 2016 16:53:58.000" 1478793238 426.33057 0
"10. Nov. 2016 16:54:08.000" 1478793248 52.246094 0
"10. Nov. 2016 16:54:18.000" 1478793258 68.51196 0
"10. Nov. 2016 16:54:38.000" 1478793278 67.62695 0
```

Measurement time

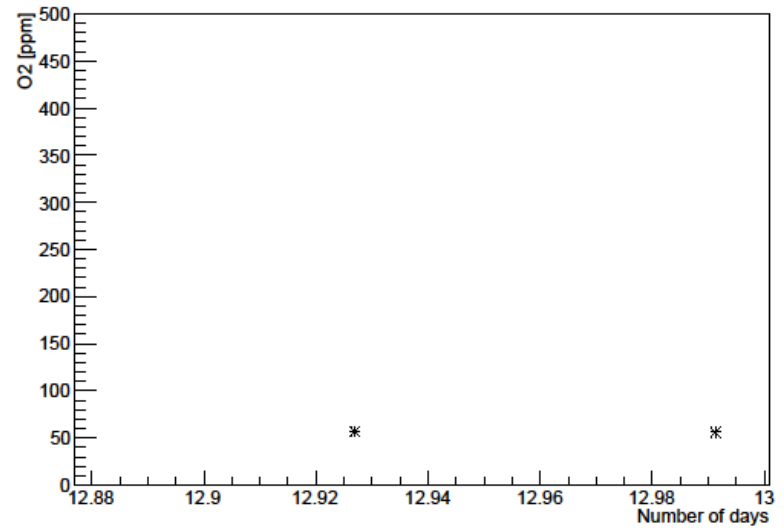
13:46~15:39

(15.574~15.652 [days])

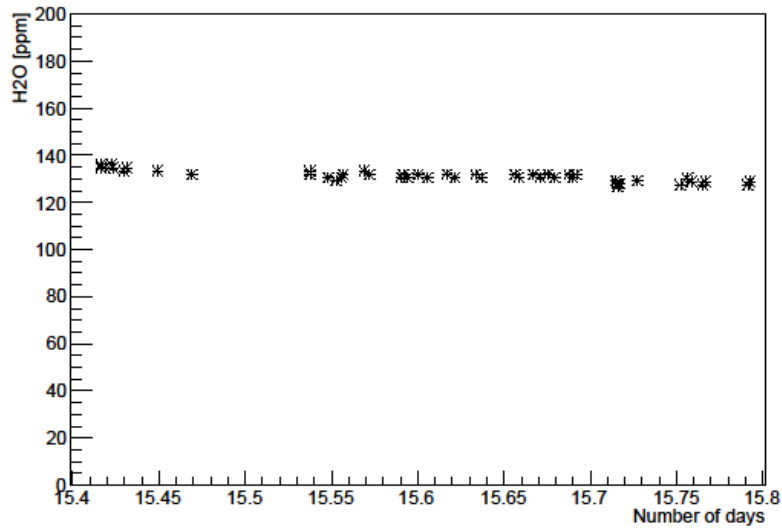
H2O(Gate GEM_07. Nov. 2016)



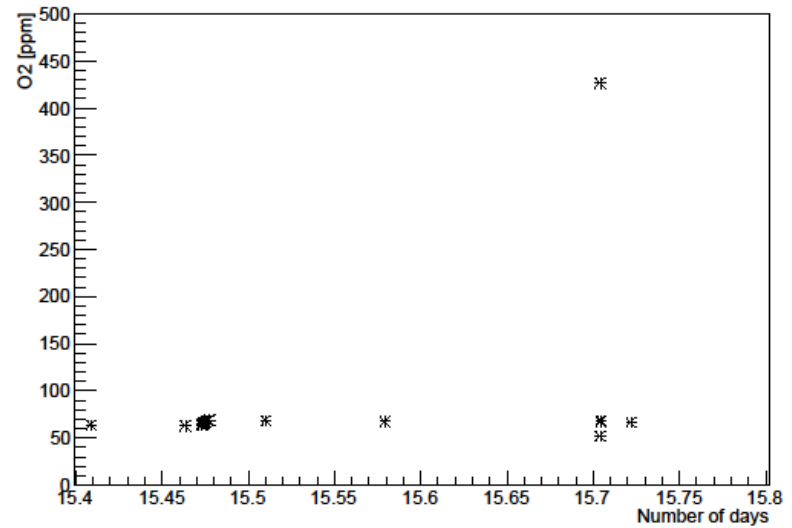
O2(Gate GEM_07. Nov. 2016)



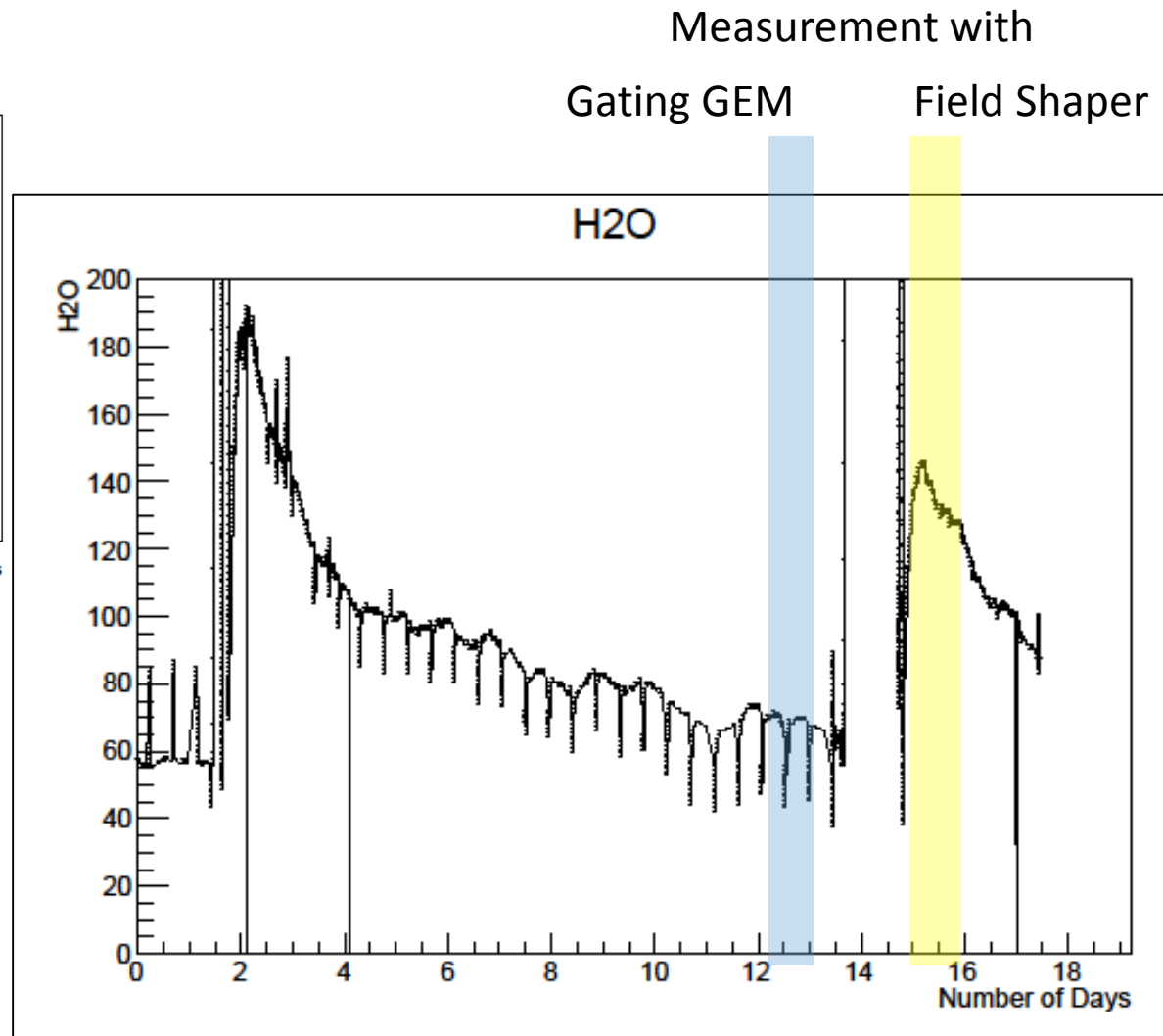
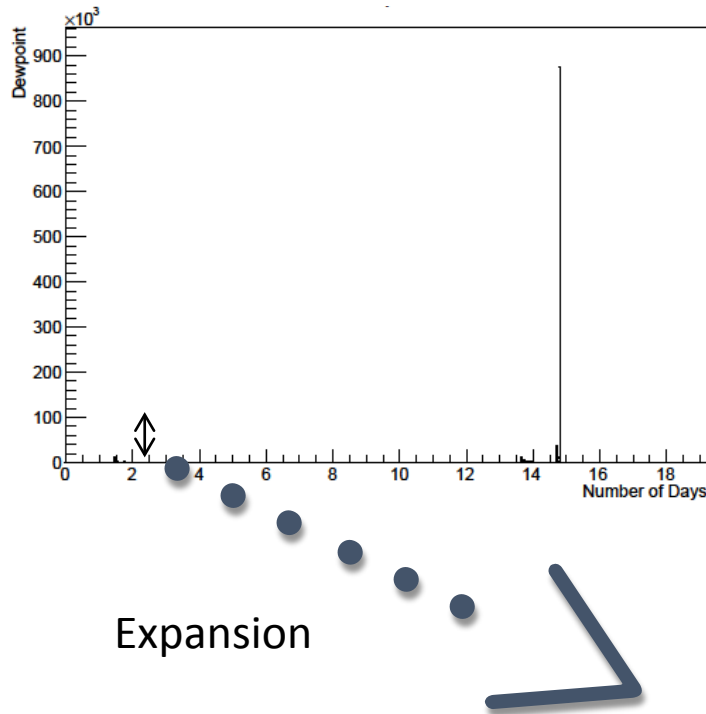
H2O(Field shaper_10. Nov. 2016)



O2(Field shaper_10. Nov. 2016)



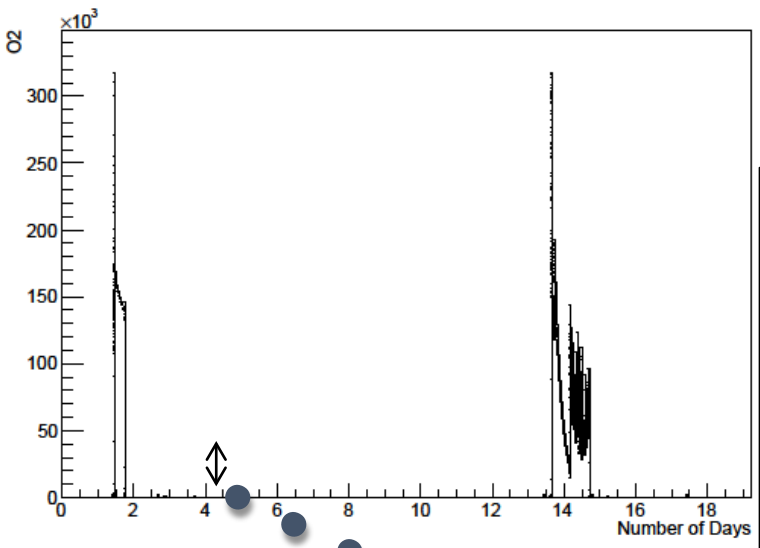
H₂O [ppm]



- This recorded from 26. Oct. to 12. Nov.(2016) .

Text File Name: ILC.EXP_LPTPC.DEWPOINT_DEWPOINT1_H2OPPM.20161026-20161112.txt

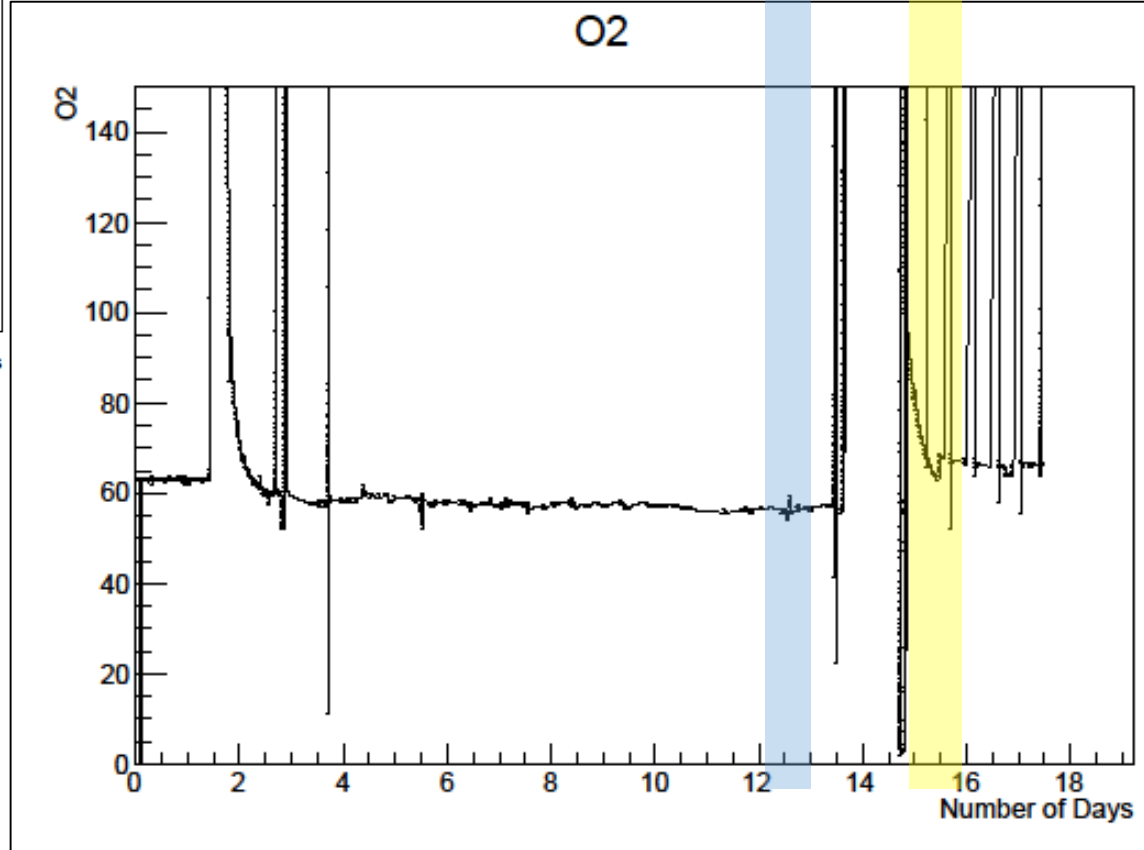
O₂ [ppm]



Expansion

なぜ酸素がそんなに入ってきているのか？どこから入ってきたのか？

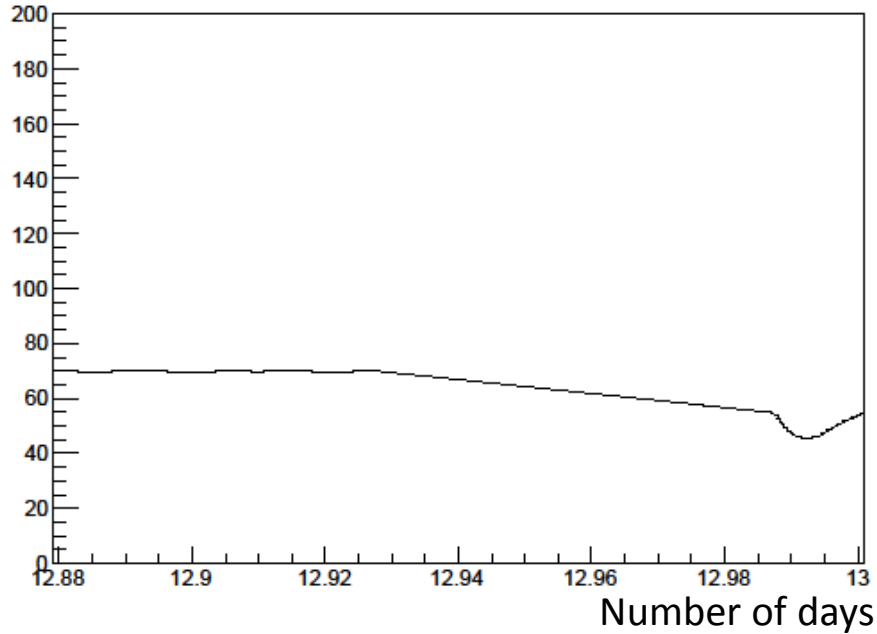
Measurement with
Gating GEM Field Shaper



- This recorded from 26. Oct. to 12. Nov.(2016) .

H₂O [ppm]

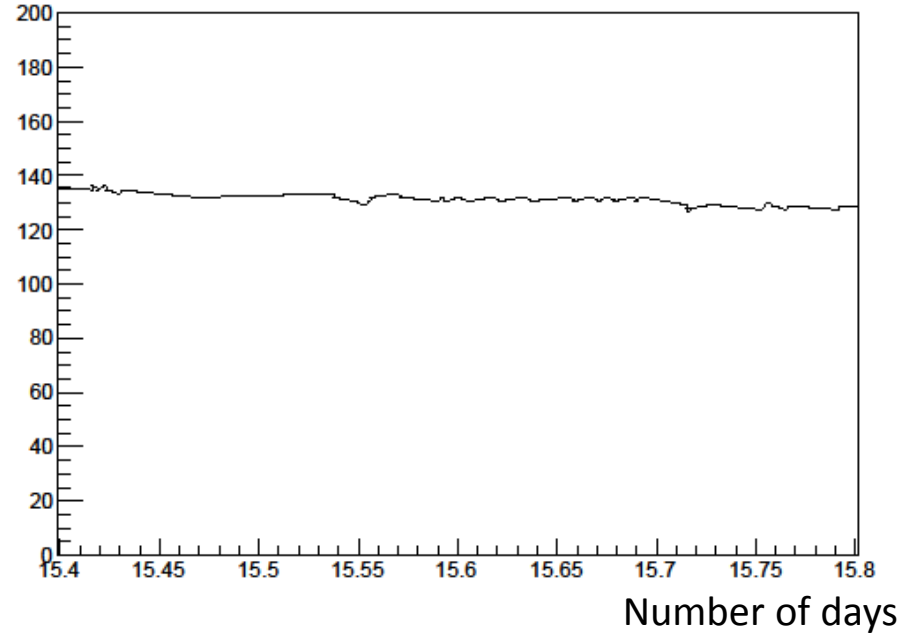
w/ Gating GEM



Average

56.16 ppm

w/o Gating GEM(w/ Field shaper)

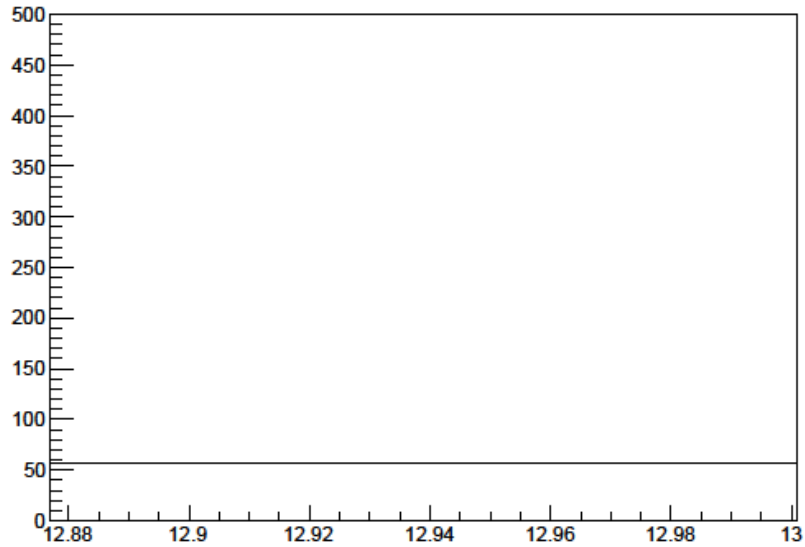


131.2 ppm

- In the both case, H₂O seem to decrease.

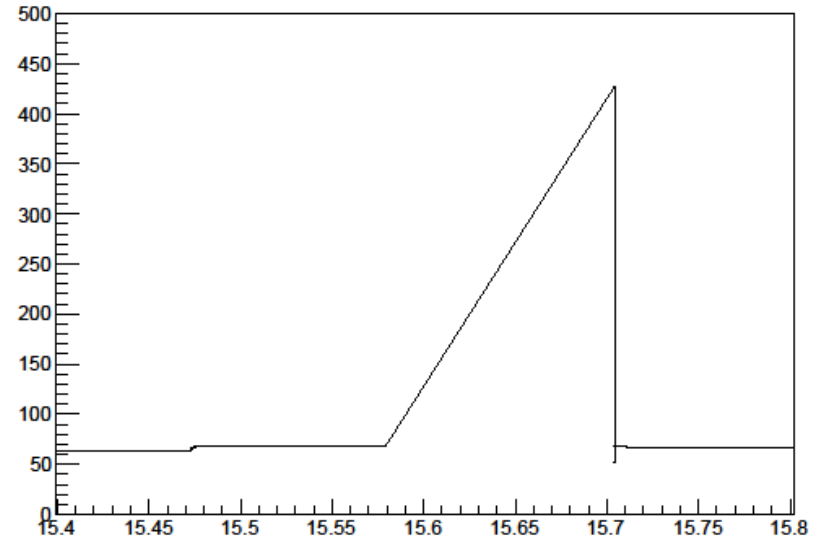
O₂ [ppm]

w/ Gating GEM



Number of days

w/o Gating GEM(w/ Field shaper)



Number of days

Average

56.53 ppm

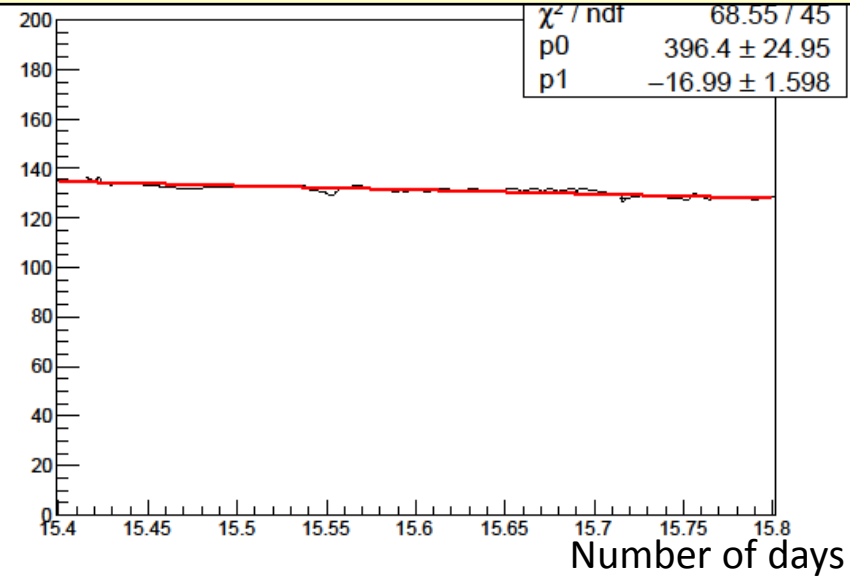
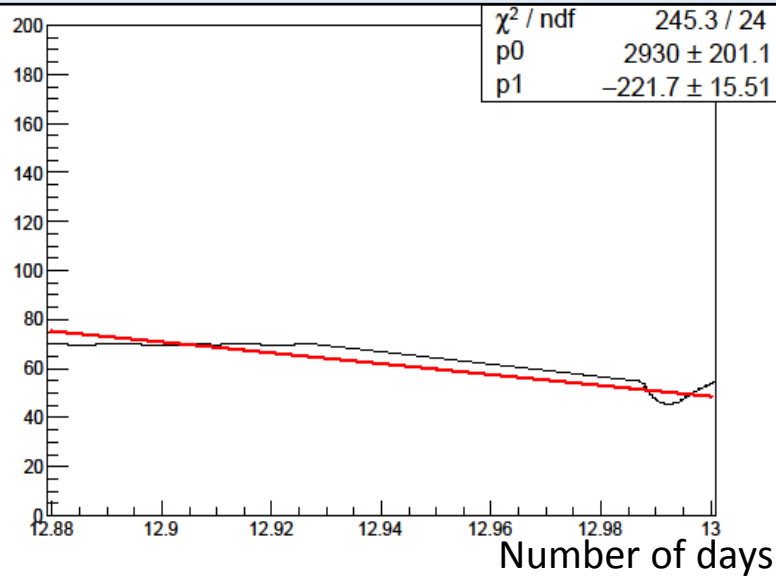
- O₂ seem to decrease.

Linear fitting

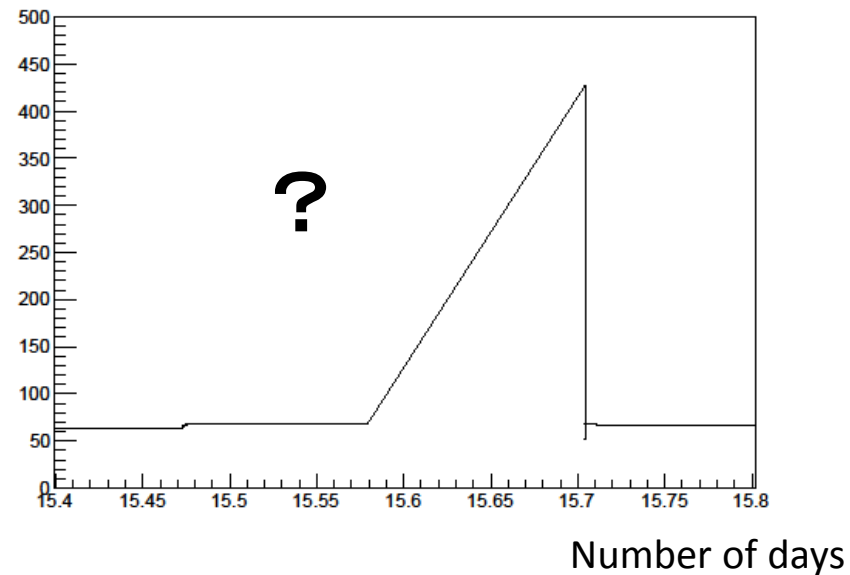
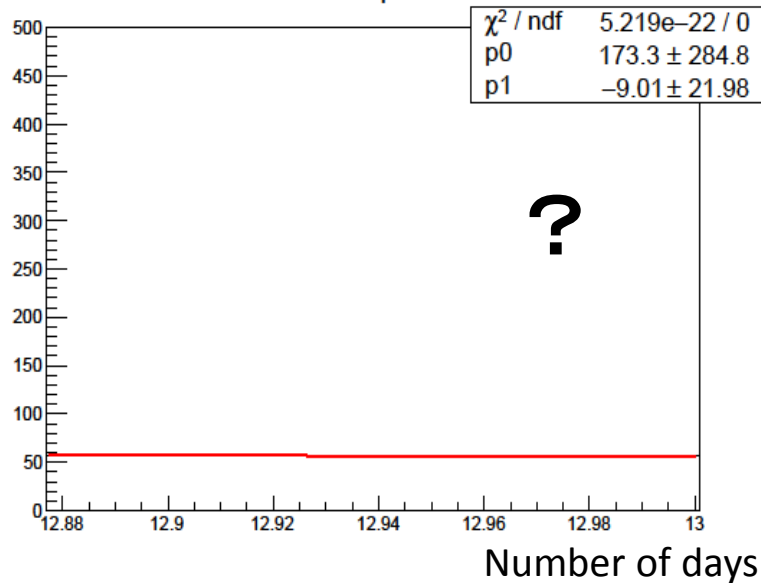
w/ Gating GEM

w/o Gating GEM(w/ Field shaper)

H2O



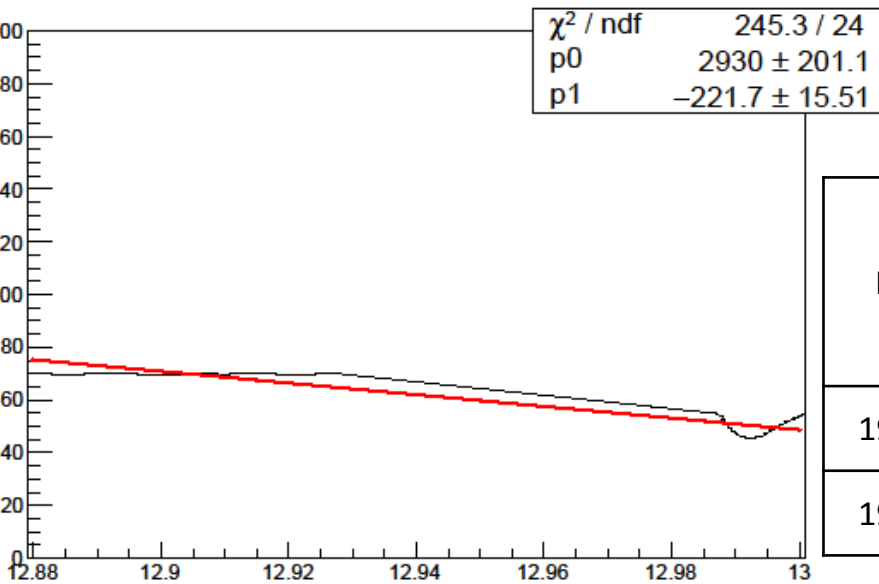
O2



H₂O [ppm]

- How to calculate average of H₂O and O₂ of each Run

Example of Run number 19972(H₂O)



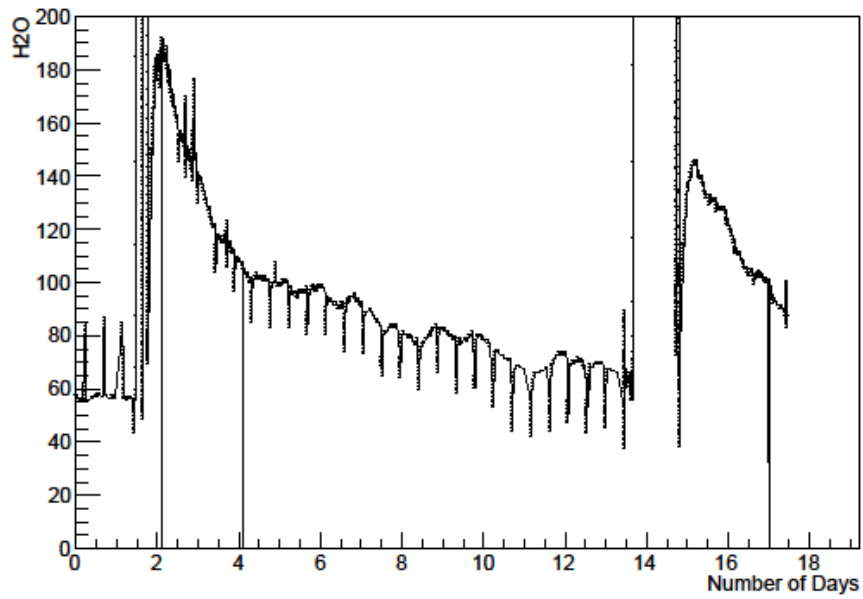
$$H(x) = -221.7x + 2930 \quad * \text{Exclude error}$$

Run	Time when measurement started	→ Convert to the day	H ₂ O	Average H ₂ O
19972	21:37	12.901	69.8483	69.29405
19973	21:45	12.906	68.7398	

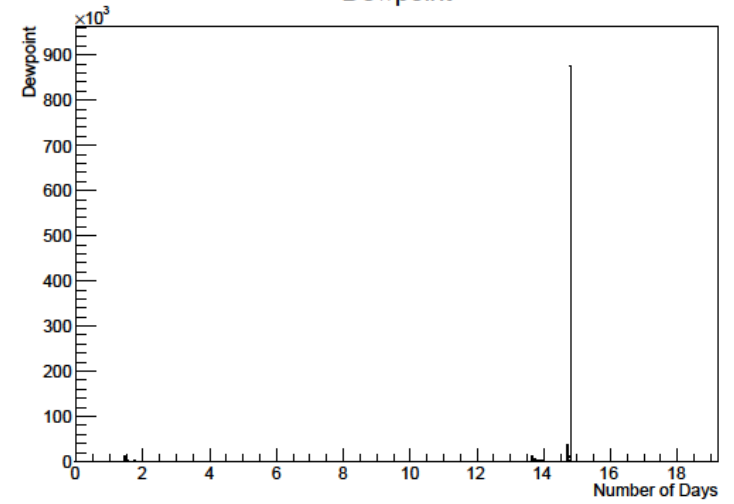
Sum/2

*0 hour, 0 minute, 0 second on October 26 is set to 0 [day]

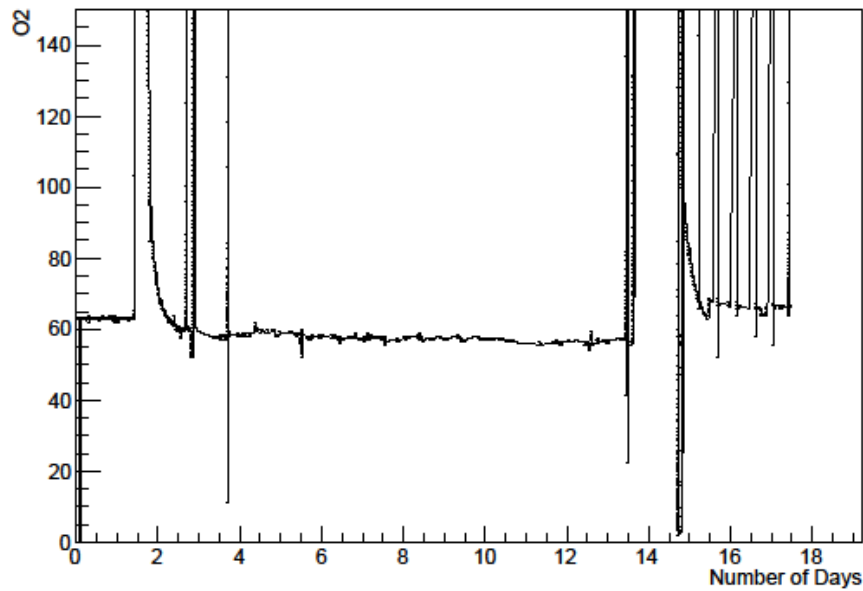
H2O



Dewpoint



O2



O2

