

Weekly report

SNU

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Decelerator issue

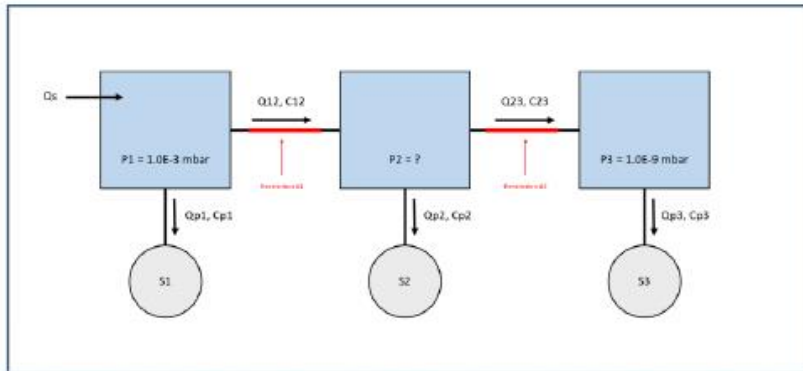
- Check the required item for control system (compactDAQ (compactRio))

Analog input (NI9201(8ch))

- power supply (V,I) : decelerator ((5-1)ch x2)

Analog output (NI9264(16ch))

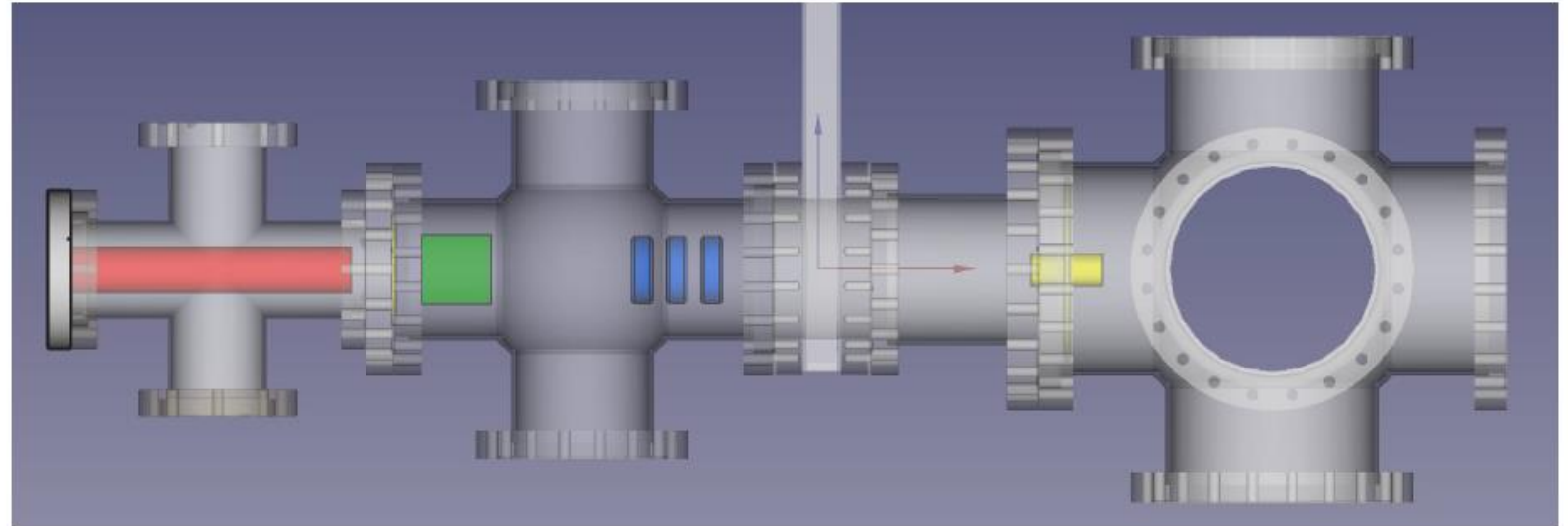
- Power supply (V) : decelerator (5ch) + triplet quadrupole (4ch)
+ MCP (4ch)
- Need more (relays for gate valve, proton bender + optics)



S1 – Leybold CF63

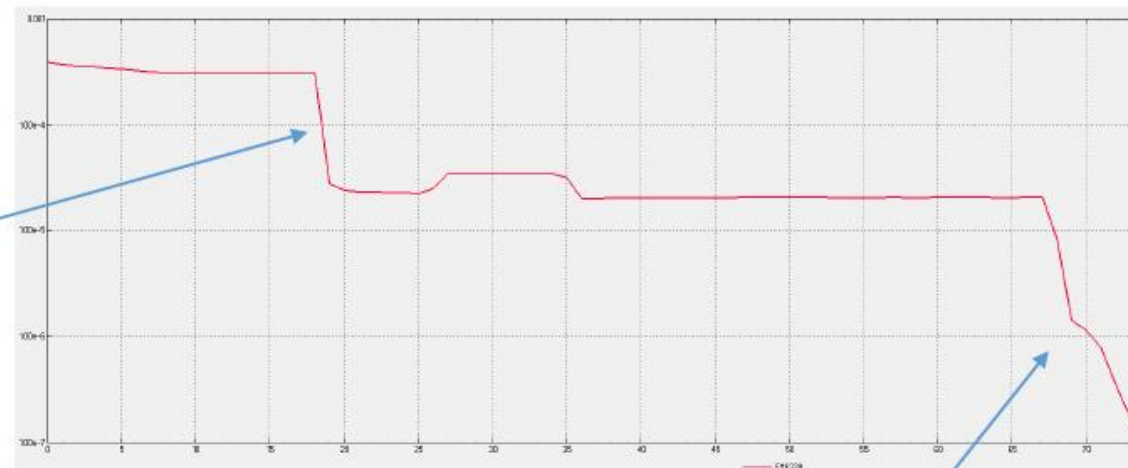
S2 – nEXT Edwards

S3 – Leybold 1000 (LKB)



Restriction #1 – disk, hole 10mm

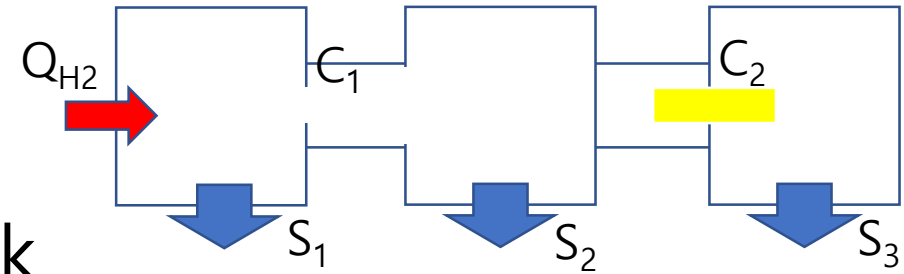
Hard to reach a better vacuum with turbo pumps only. Clearly need a new pump on the decelerator or a bigger turbo on the first chamber.



Restriction #1 – tube, hole 10mm, length 50 mm

Molflow+ simulation with the current space occupancy

Decelerator issue



- Simple calculation to cross-check

$$Q_{H_2} = 0.24 [\text{mbar} \cdot \text{l/s}], S_1 = 510 [\text{l/s}], S_2 = 280 [\text{l/s}], S_3 = 1000 [\text{l/s}]$$

$$- Q_{H_2} = S_1 P_1 + C_1 (P_1 - P_2)$$

$$- C_1 (P_1 - P_2) = S_2 P_2 + C_2 (P_2 - P_3)$$

$$- C_2 (P_2 - P_3) < S_3 P_3$$

$$\leftarrow C_2 = 12.1 \cdot d^3 / l \cdot f_{\text{conv}}(H_2) = 9.12 [\text{l/s}] (\because d=1\text{cm}, l=5\text{cm}, f=3.77)$$

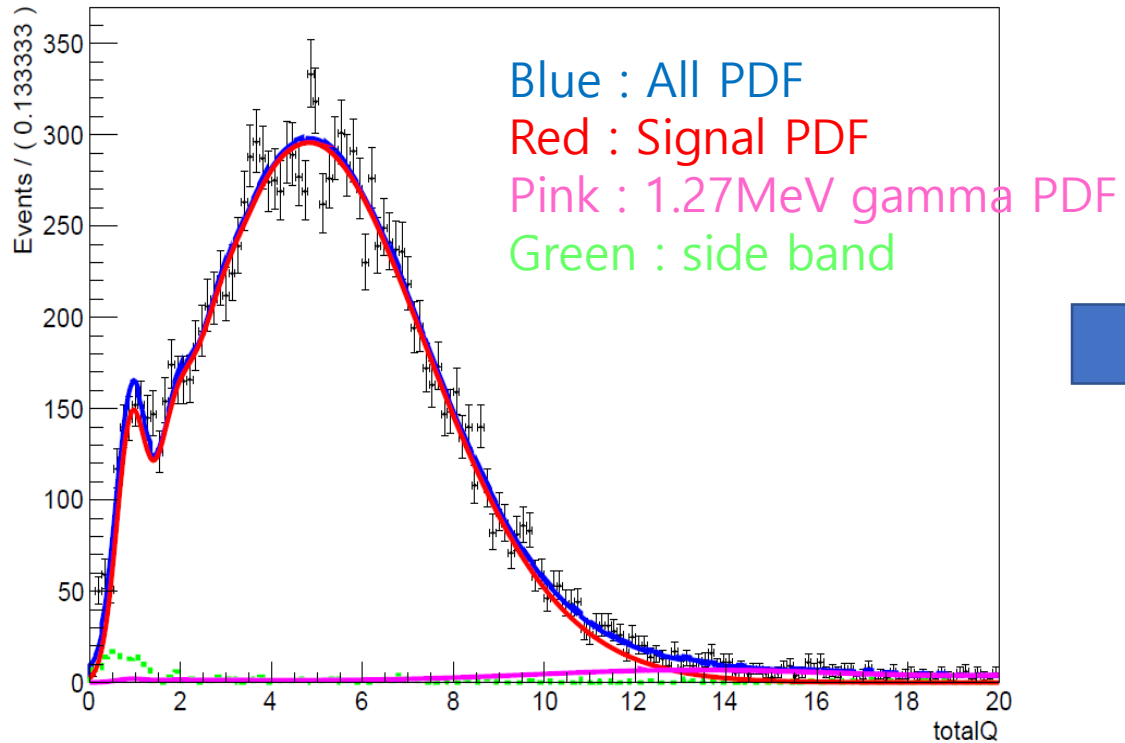
$$C_1 = 11.6 \cdot A = 11.6 \cdot \pi \cdot d^2 / 4 \cdot f_{\text{conv}}(H_2) = 34.33 [\text{l/s}]$$

$$\rightarrow P_2 < 109 P_3, P_1 = 9.4 P_2, P_1 = 0.44 \text{mbar}$$

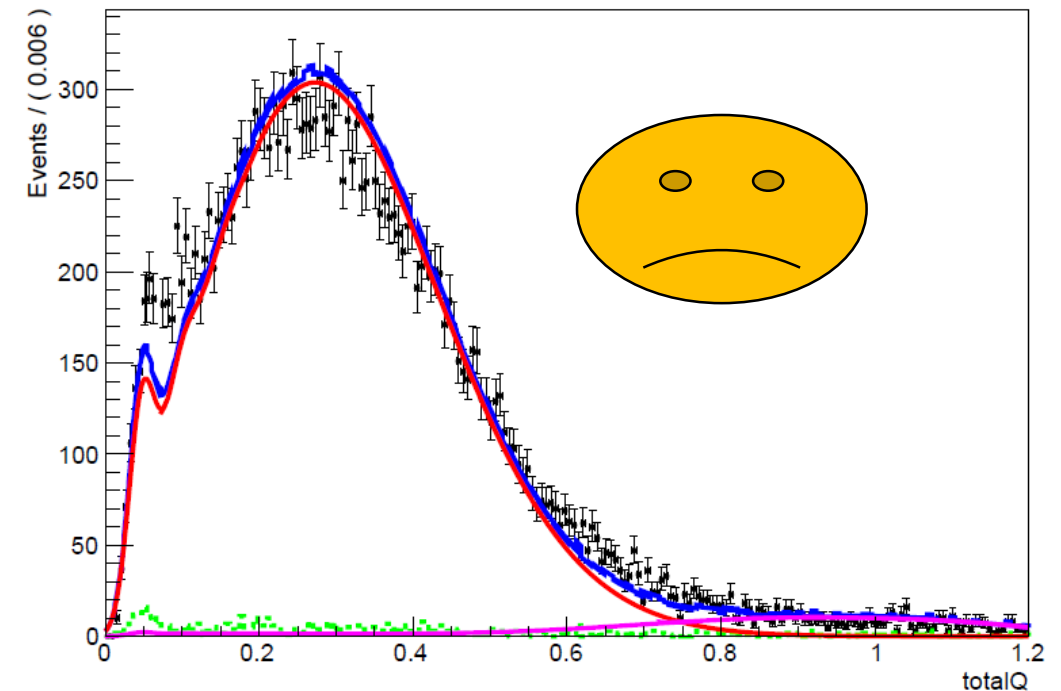
→ Well matched with simulation from Audric

Fitting results (back to back)

PWO Back to back (2300V)



PWO Back to back (1800V)

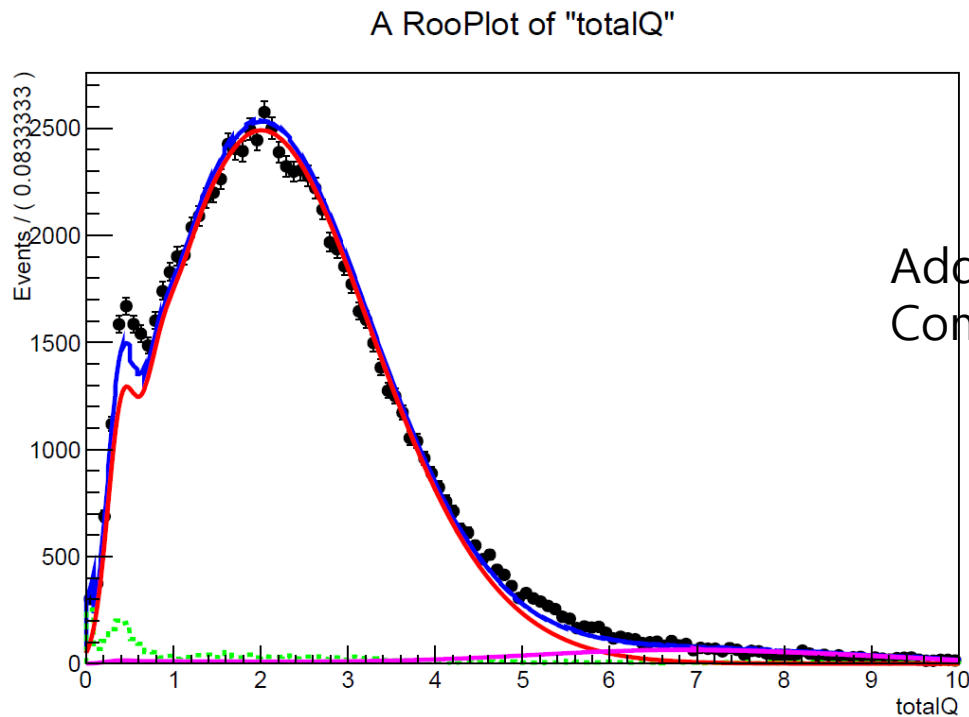


NAME	VALUE	ERROR
a	6.25207e+00	3.00571e-02
fr12	3.51832e-02	2.44627e-03
$\chi^2 = 9.542727e-01$		

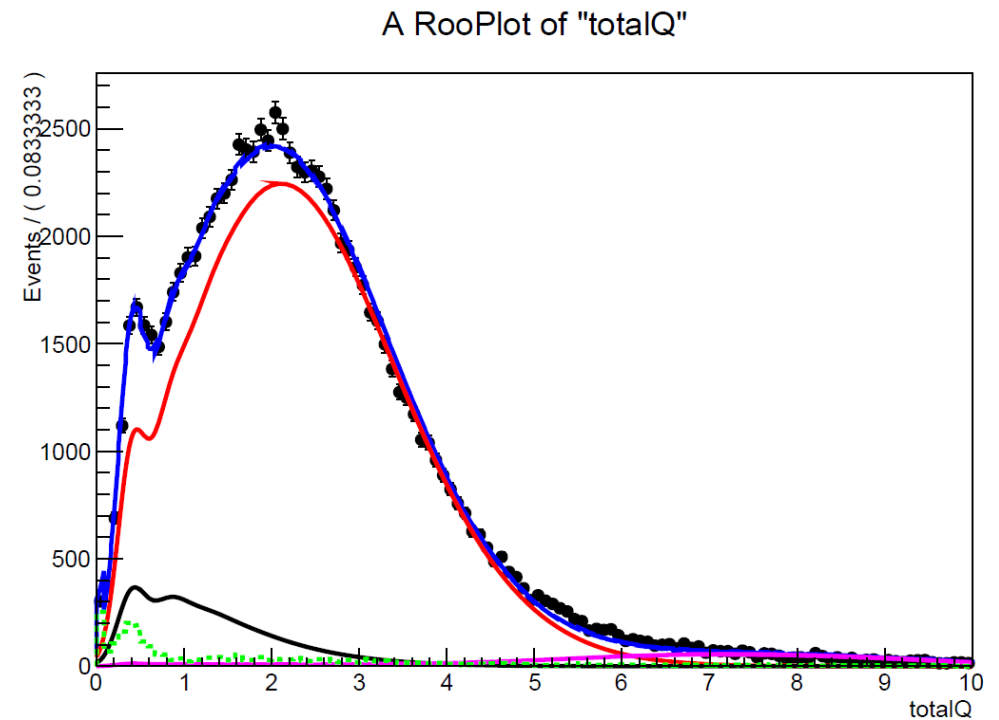
2018-02-01

NAME	VALUE	ERROR
a	8.04096e+00	3.62184e-02
fr12	4.59403e-02	2.17213e-03
$\chi^2 = 1.94685$		

Fitting result (back to back : 2300V)



Adding
Compton PDF



	NAME	VALUE	ERROR
•	1 a	7.69403e+00	2.84353e-02
•	2 fr12	3.31633e-02	9.58622e-04
•	3 frcomp	7.46984e-02	5.56705e-03

2018-02-01

→ Compton BG fraction at back to back case will be checked by simulation

Weekly meeting

