

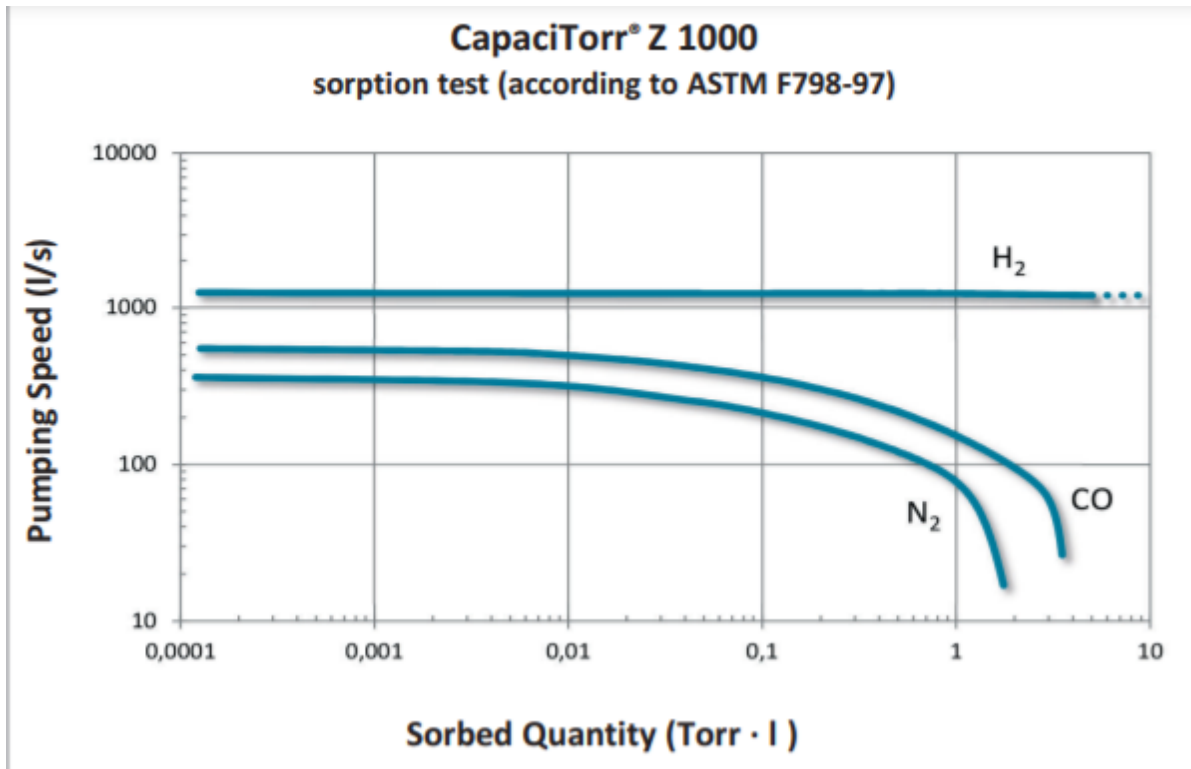
CI Update

25/02/2022



UNIVERSITY OF
LIVERPOOL

NEG property



Typical Pump Characteristics		CapaciTorr Z 1000
Alloy Type		ZAO
Alloy Composition		Zr V Ti Al
Getter Mass (g)		280
Getter Surface (cm ²)		1530
Activation Power (W)		190
Pumping Speed (l/s)	H ₂	1250
	H ₂ O	900
	N ₂	360
	CO	550
Sorption Capacity (Torr·l)	H ₂	5600
	H ₂ O	70
	N ₂	1.7
	CO	3.5

Saturation Estimates

$$t_{\text{saturation}} = \frac{\text{Sorpton capacity}}{\text{Pumping speed} \times \Delta\text{Pressure}}$$

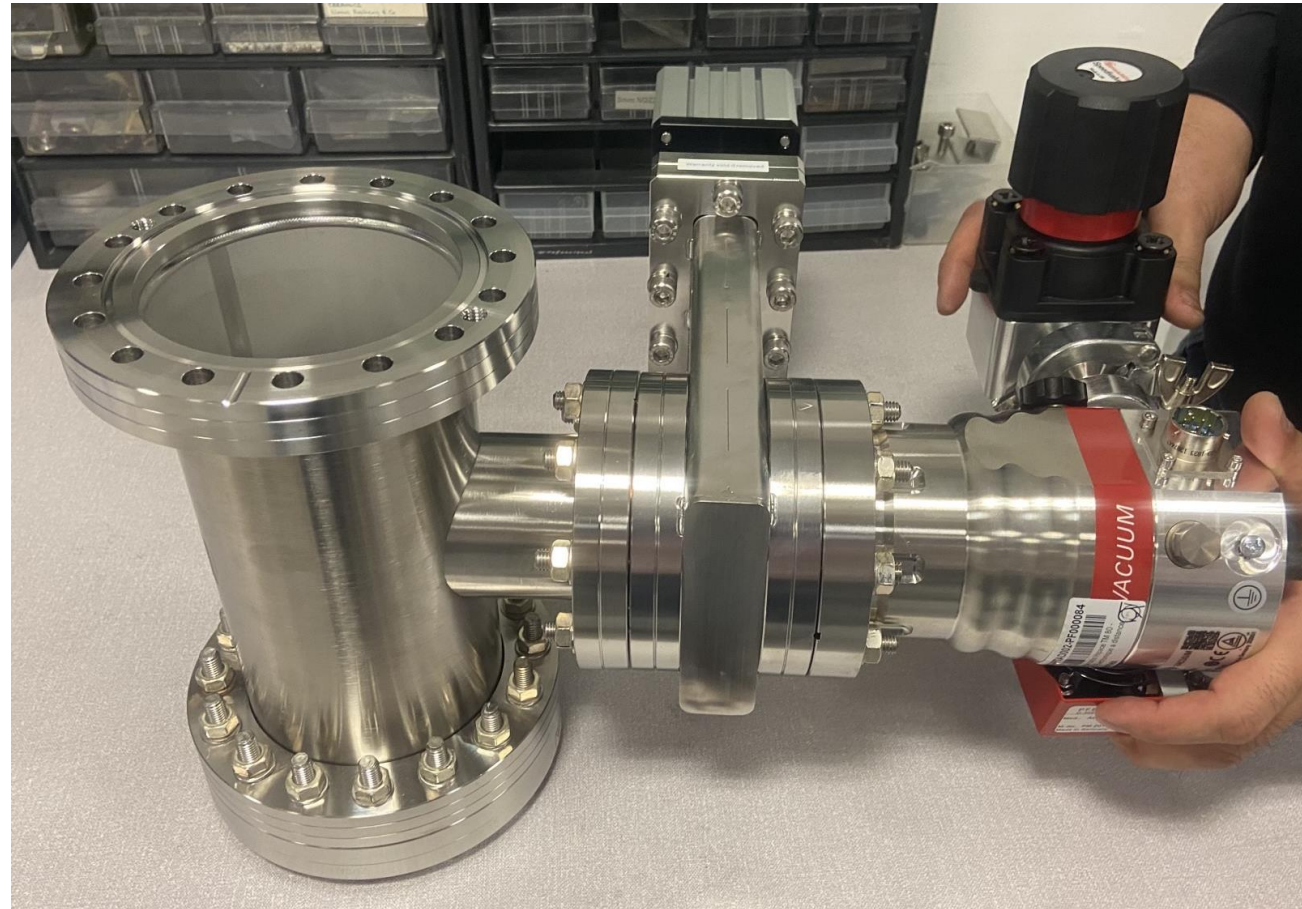
$$\text{Where } \Delta\text{Pressure} = P_{\text{Jet on}} - P_{\text{Jet off}}$$

Sorpton capacity
= 2.26mbar L

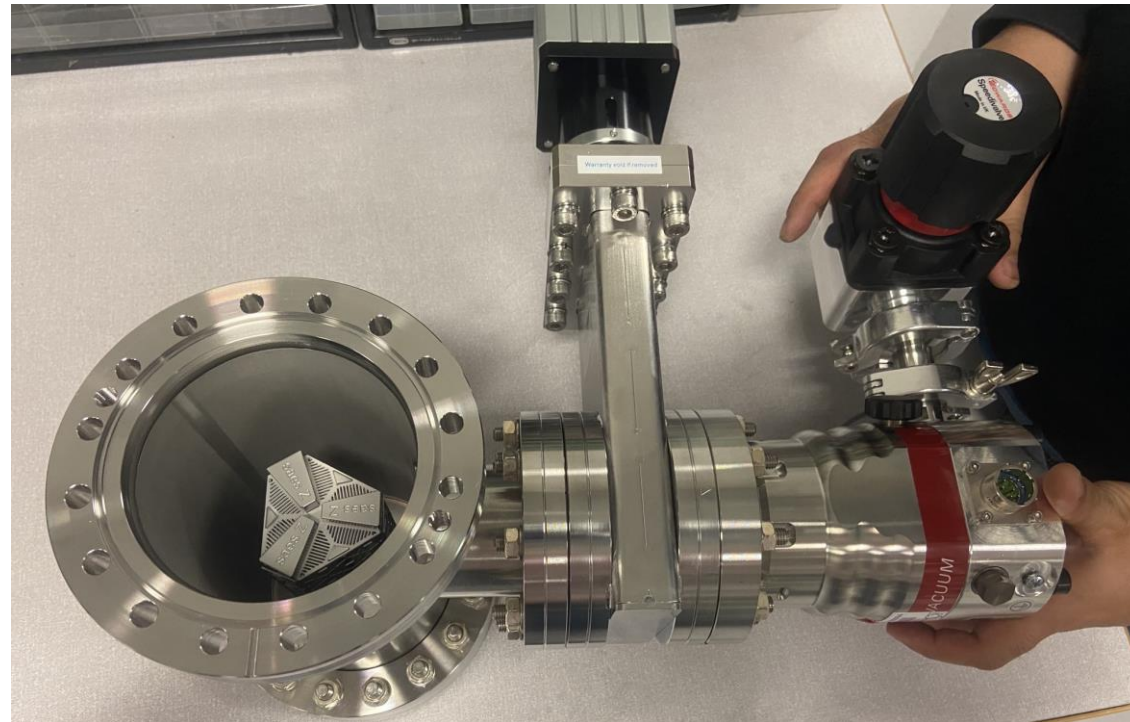
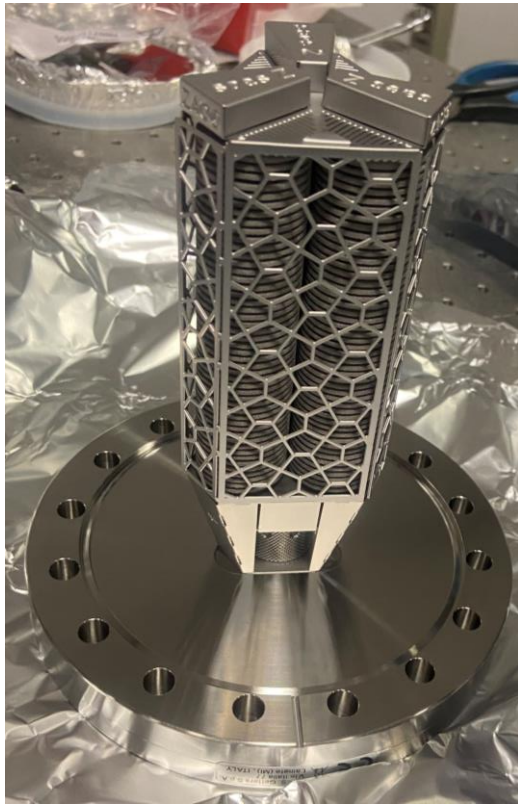
Pumping speed
= 360 L/s

Skimmer	Chamber	ΔP	Saturation time
0.7x9mm	Interaction	9.45E-09	7.7 days
0.3x9mm	Interaction	3.50E-09	20.8 days
0.7x9mm	Dump	9.50E-08	18.4 hours
0.3x9mm	Dump	4.36E-08	40.0 hours

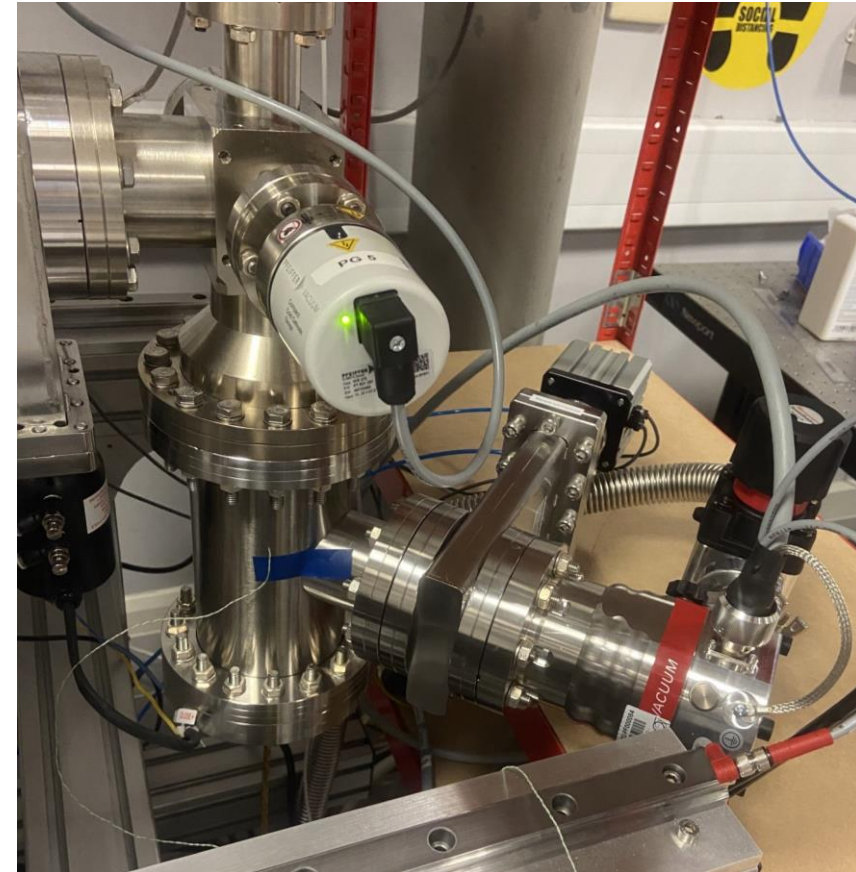
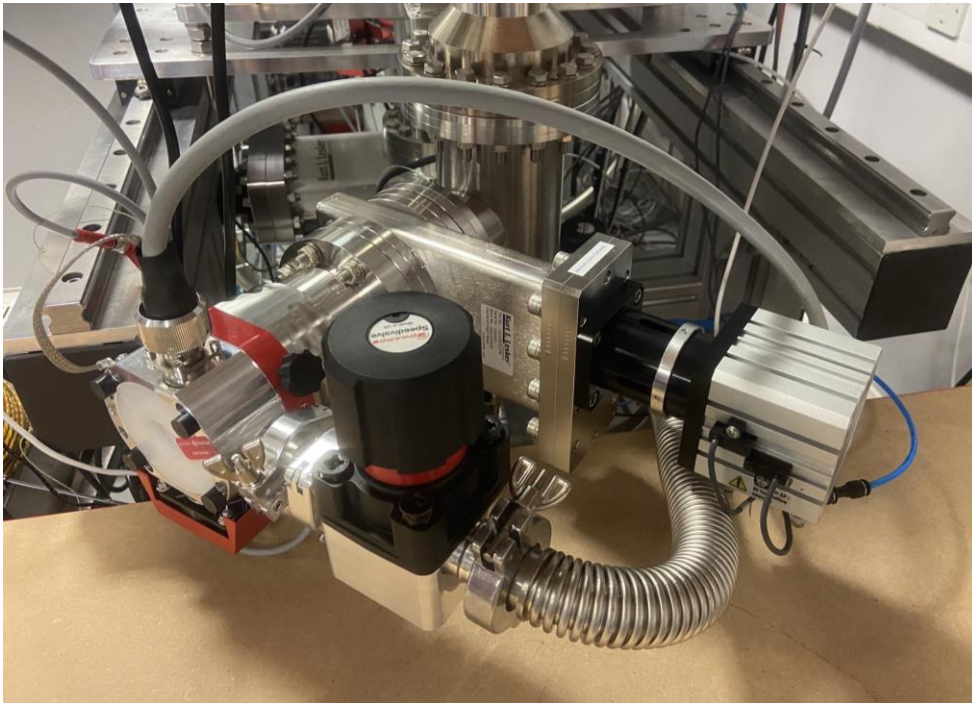
NEG subsystem



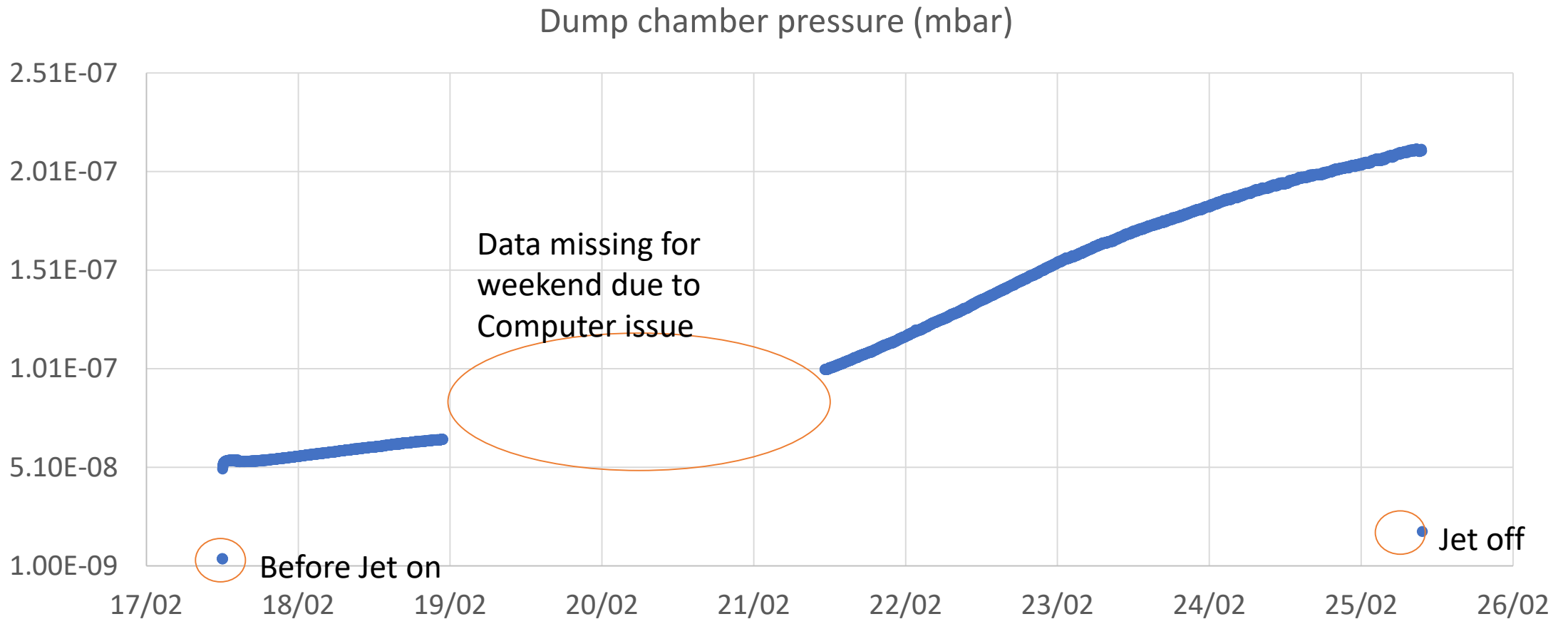
NEG subsystem



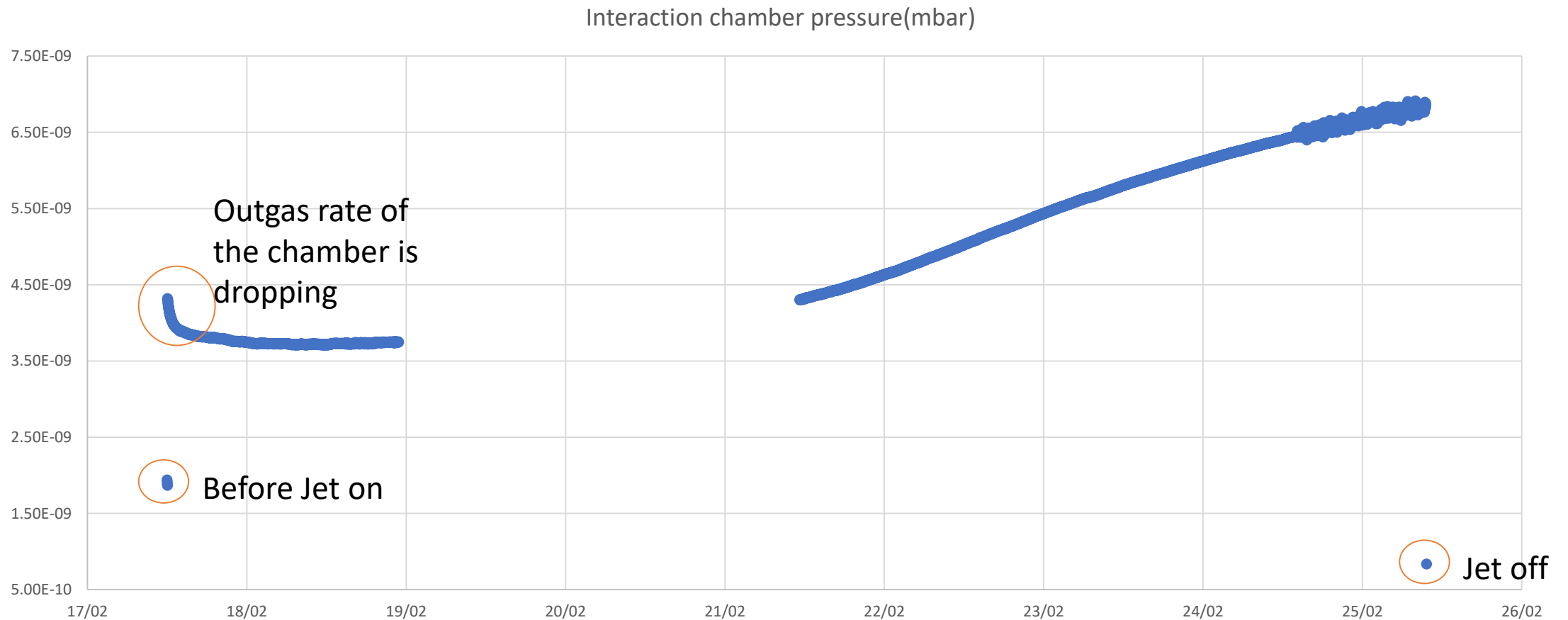
Neg pump installed in the Dump Chamber



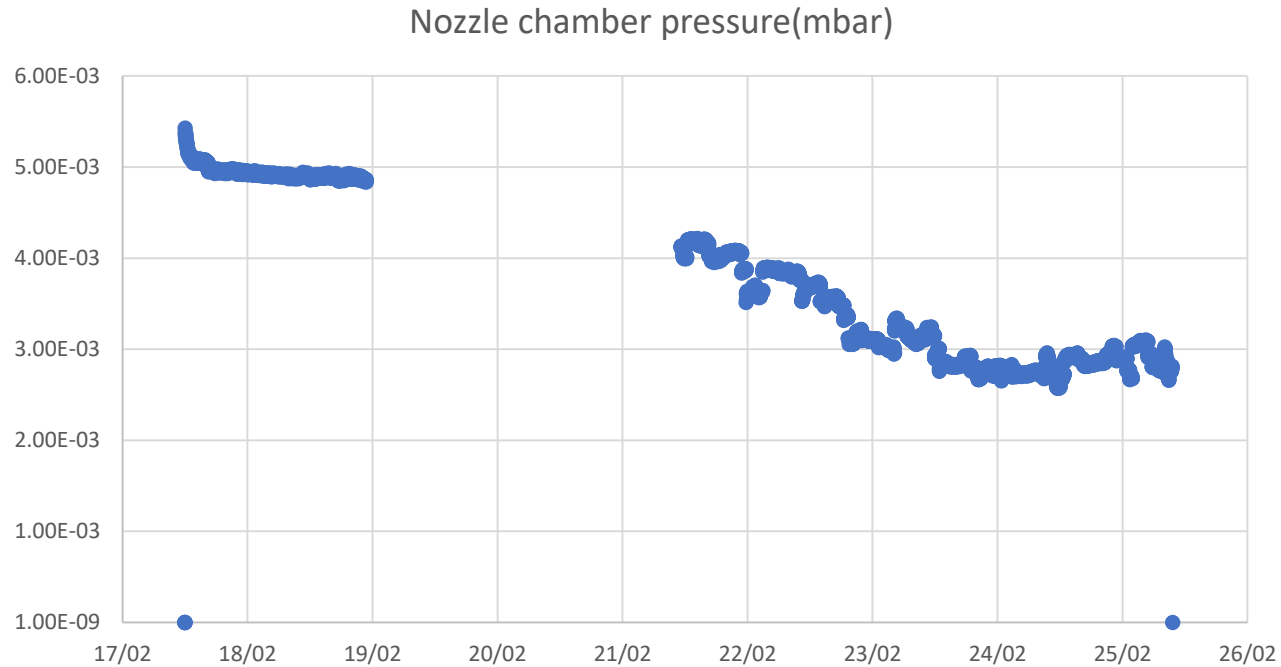
Saturation Data (dump chamber)



Saturation Data (interaction chamber)



Nozzle chamber



TMP in the nozzle chamber is warm but ok. The pressure even dropped a bit. ??Might be from the fluctuation of the main regulator or gas supply.

Saturation Data

Predicted Saturation Time (T+40hours)

Chamber	Pressure / mbar	Pressure Change
Interaction	3.80E-09	2.4%
Dump	6.84E-08	27.5%

Most Recent Measurement (T+170hours)

Chamber	Pressure / mbar	Pressure Change
Interaction	6.45E-09	73.9%
Dump	1.97E-07	268.1%

Summary

- Week long data shows the NEG is not saturated for 0.3*9 mm 3rd skimmer (5bar inlet pressure).
- The saturation time is longer than the estimation
- It is Ok to use the NEG pump in the dump chamber for the smaller skimmer.
- Future work:
 - Larger 3rd skimmer (0.7*9 mm)
 - Preparation for shipping.