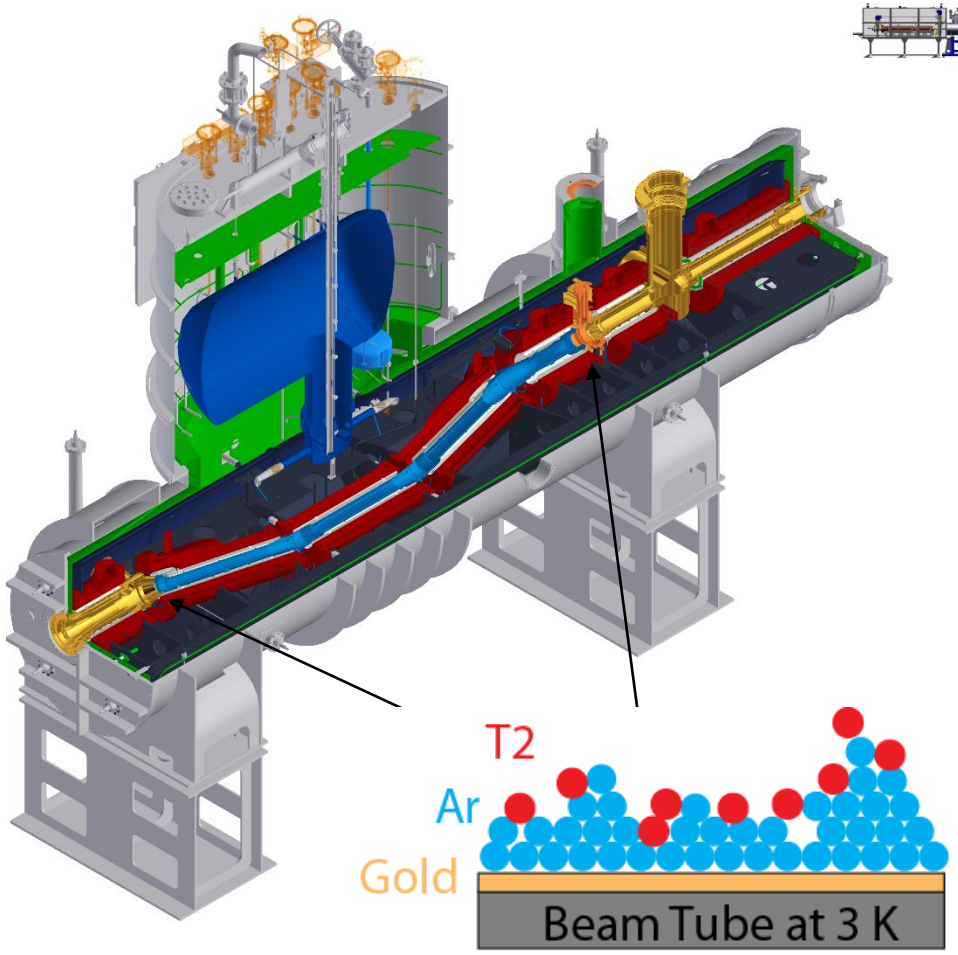
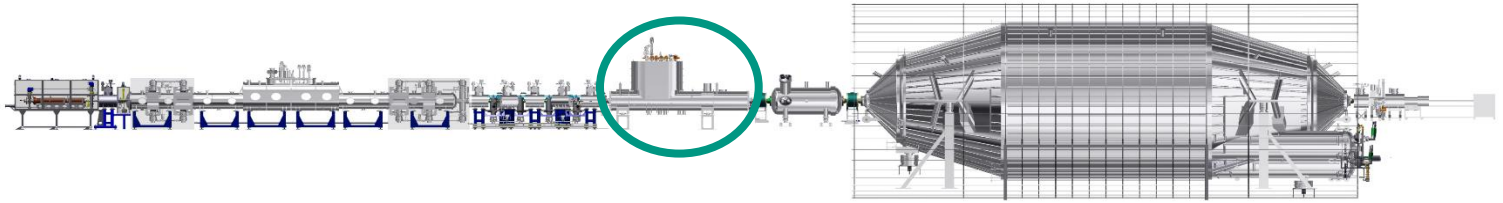
1-025: Retention measurements of the KATRIN Cryogenic Pumping Section





- requirement: reduction factor higher than seven orders of magnitude for incoming tritium flow
  → keep spectrometer background induced by tritium in the mHz-level
- cold trap: 3 K cold argon frost layer to adsorb tritium molecules in sections 2-5
- frost layer will be regenerated after 60 days (when capacity of 1 Ci is reached)

Measurement of reduction factor

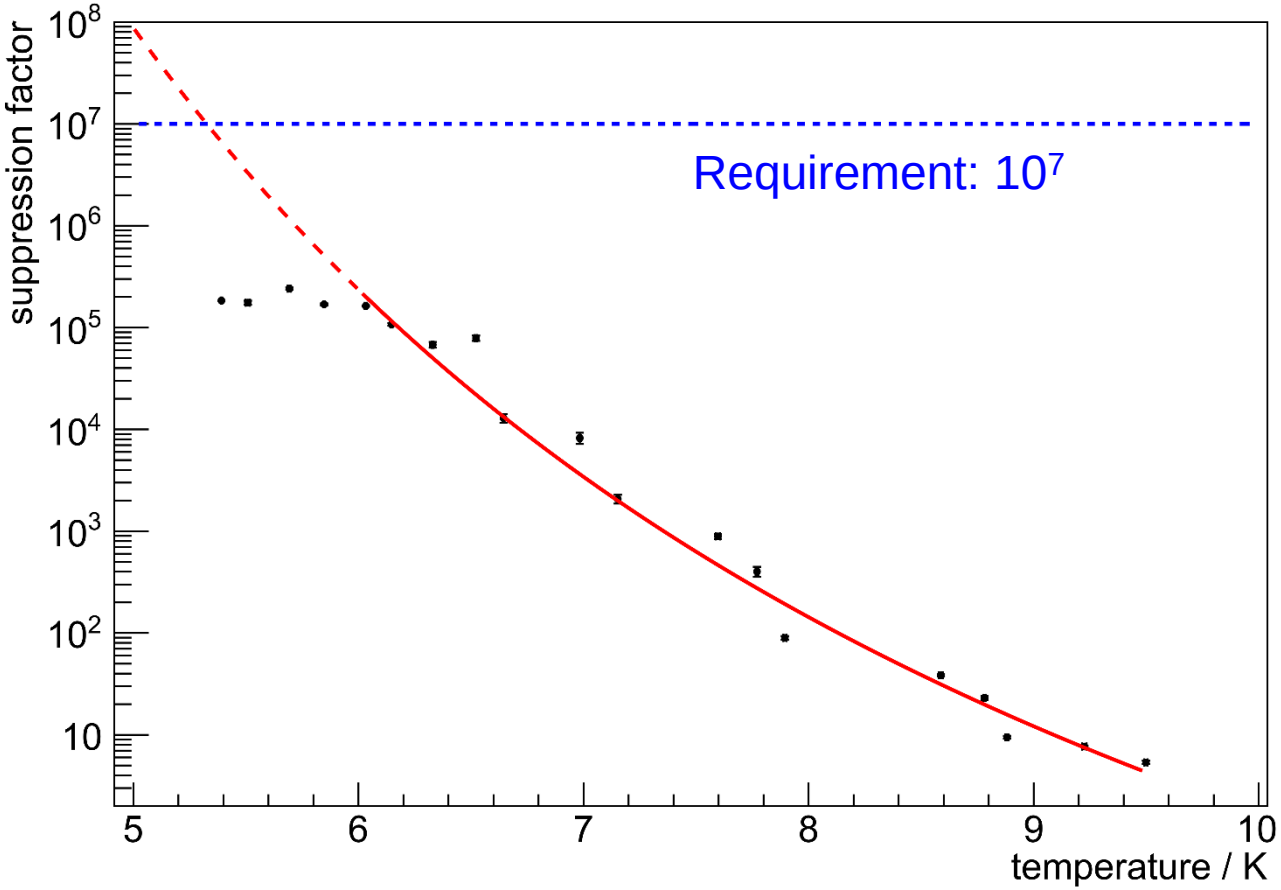
- usage of correlation between reduction factor and the temperature:

  → **reduction factor** $\propto \exp\left(\frac{E_B}{RT}\right)$

- expected temperature behavior is verified

- extrapolated reduction factor for 3 K cooling:

  → **R≈10^{15}**



Cold trap exceeds specification by 8 orders of magnitude