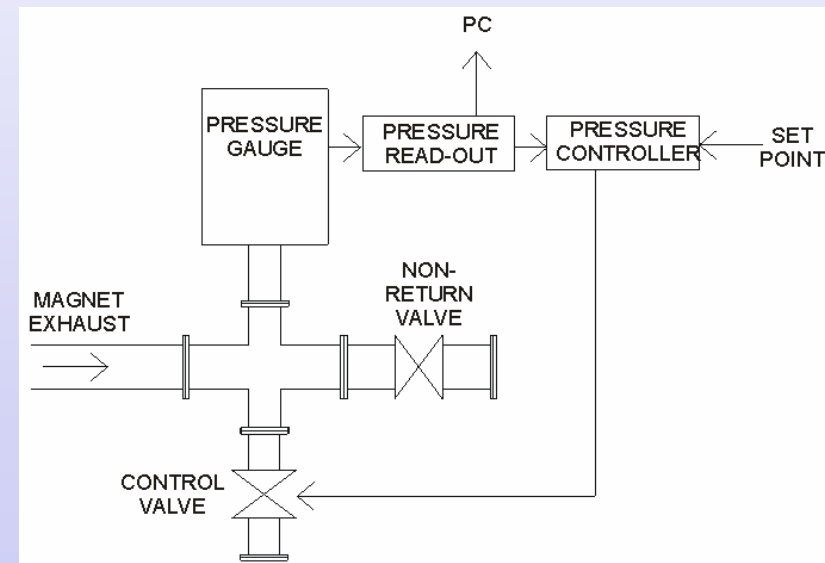
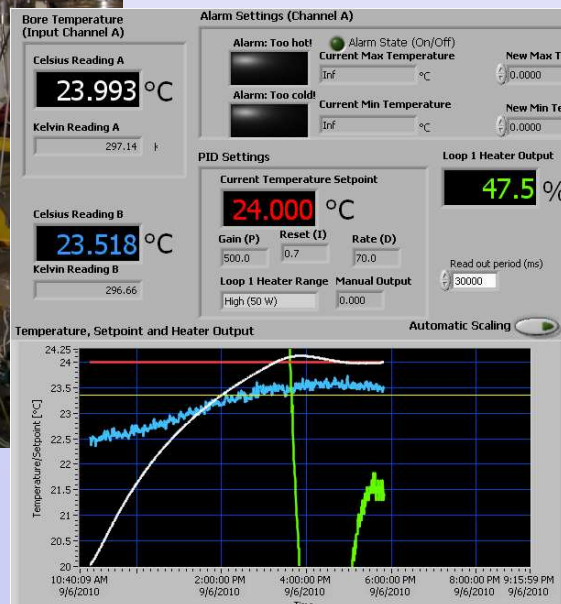


1. Temperature stabilization:

- blow warm air into magnet bore
- PID stabilization goal $\approx \pm 10$ mK

2. Pressure stabilization:

- stabilize He reservoir pressure via controlled valve in helium exhaust line
- stabilization goal $\approx \pm 0.05$ mbar



diploma work: K. Krug (2010)

➤ (unstabilized) daily temperature variation:

ΔT : 1.5 - 2 K (room)

ΔT : 0.5 K (bore)

➤ short-term stabilization (9h):

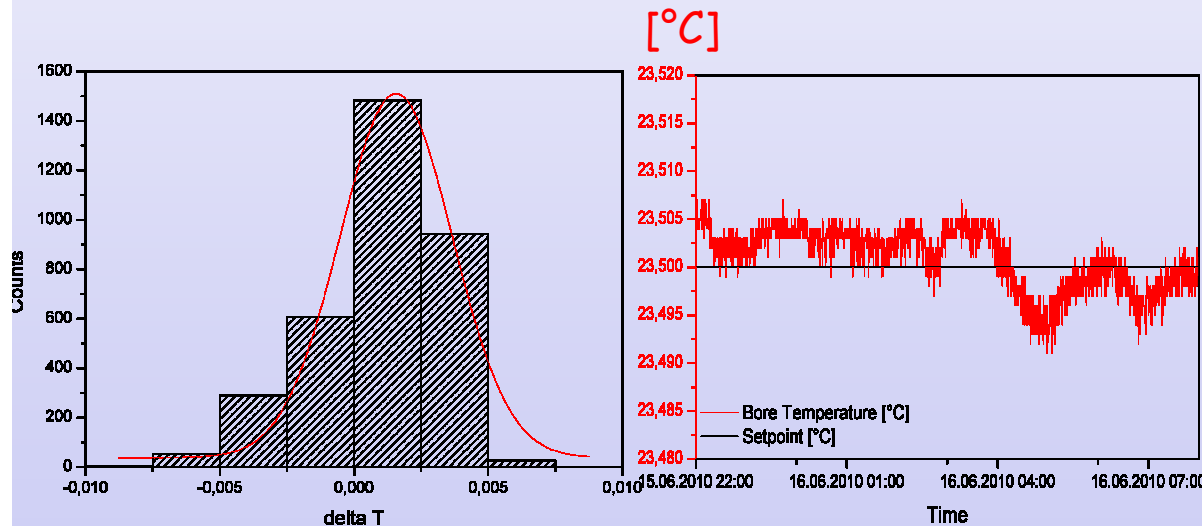
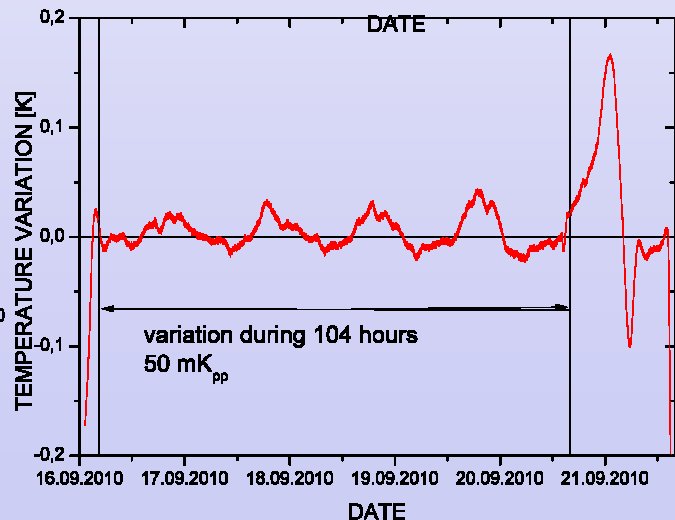
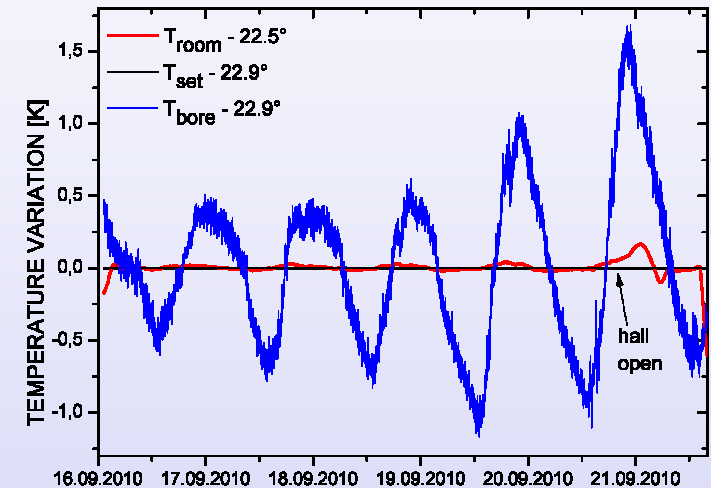
ΔT : 200 mK (room temperature)

ΔT : 2 mK (bore temperature)

➤ long-term stabilization (5d):

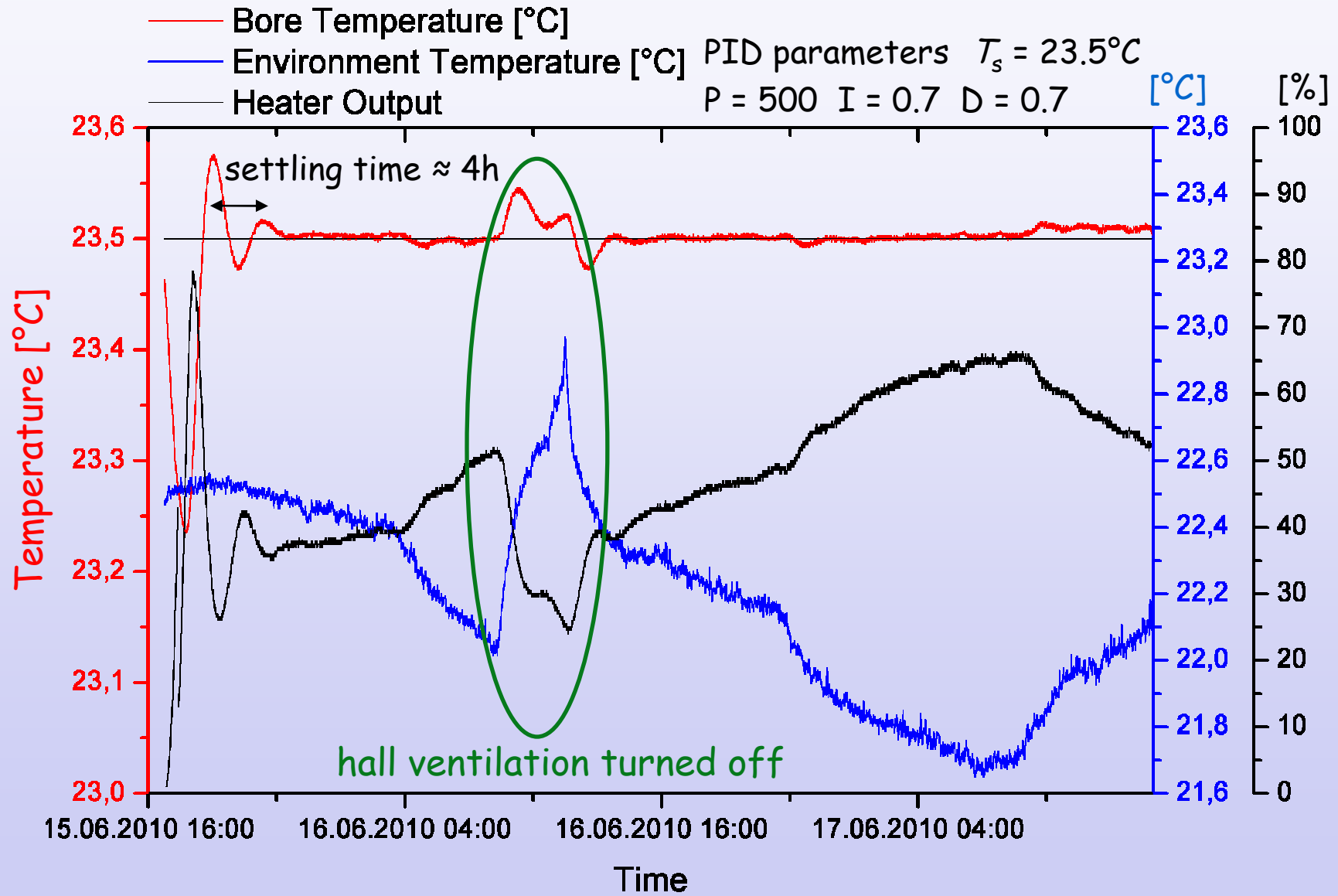
ΔT : 1.5 - 2 K (room)

ΔT : 0.05 K (bore)

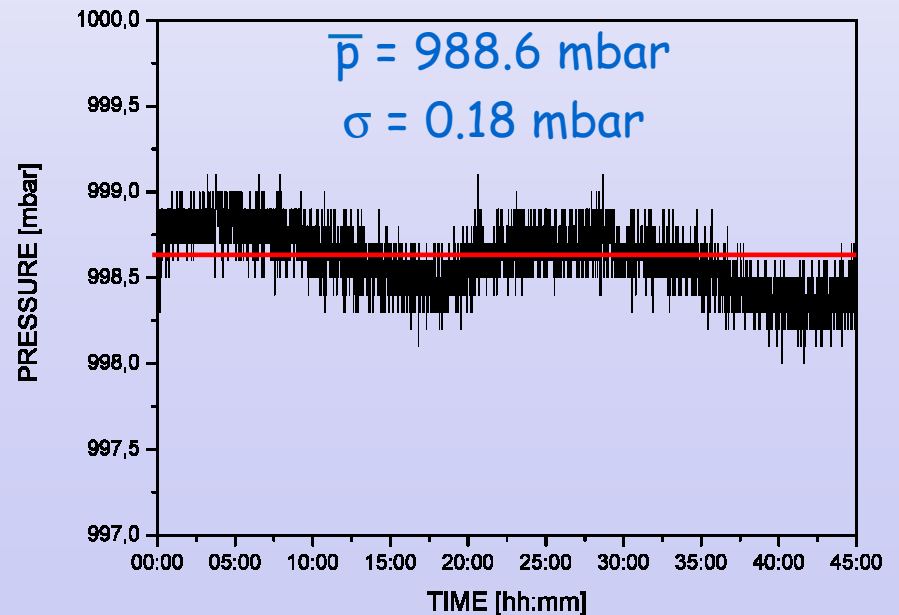
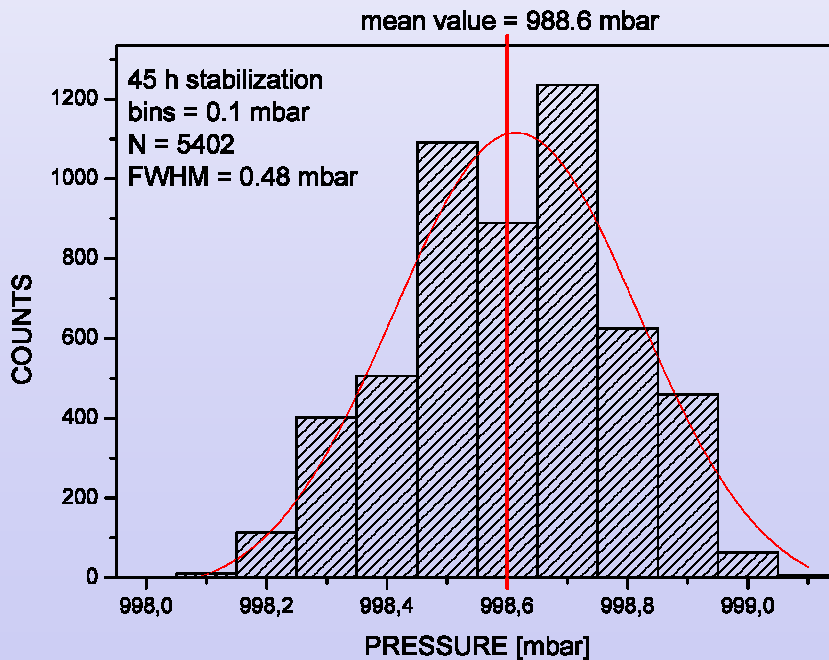
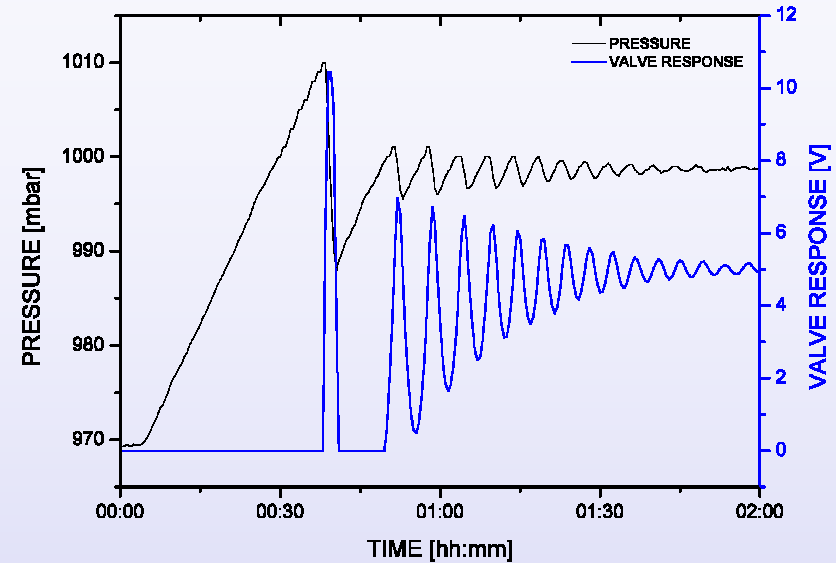


$\langle \Delta T \rangle = 1.6 \text{ mK}$
 $\sigma = 2.1 \text{ mK}$

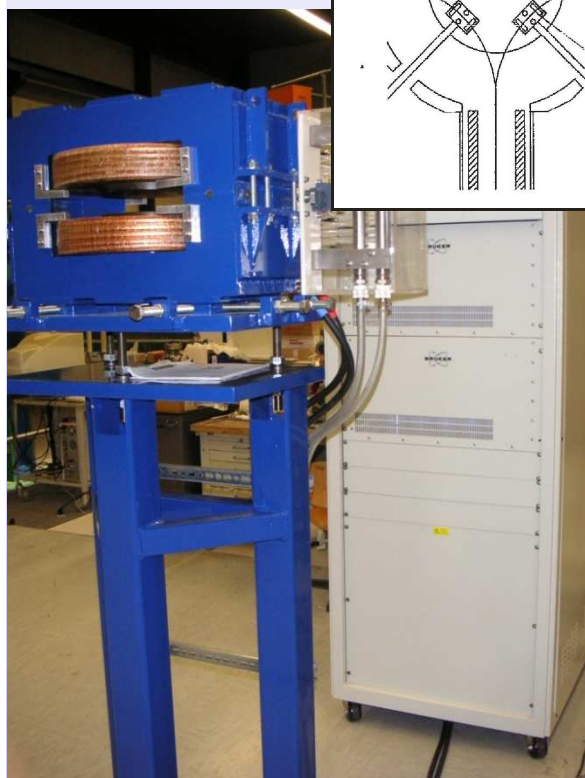
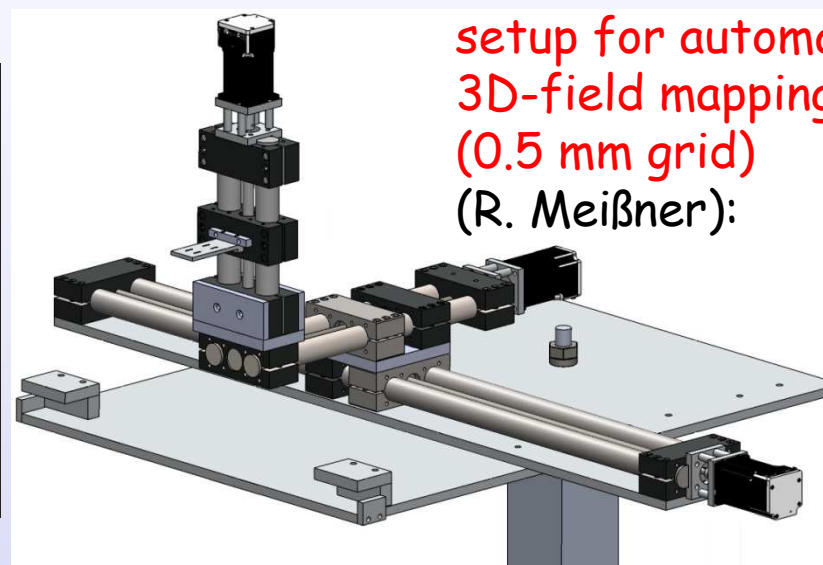
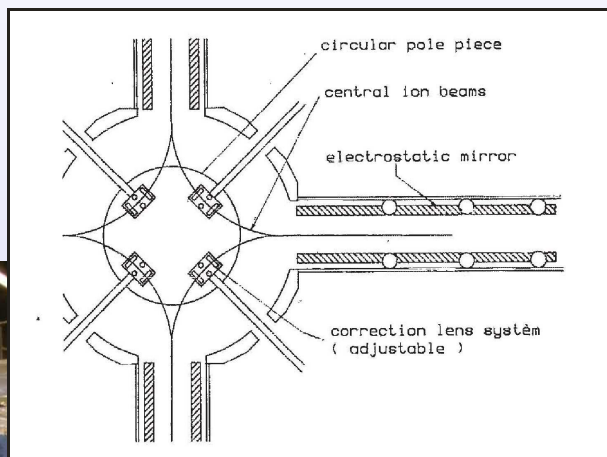
Temperature Stabilization: Response to External Disturbance



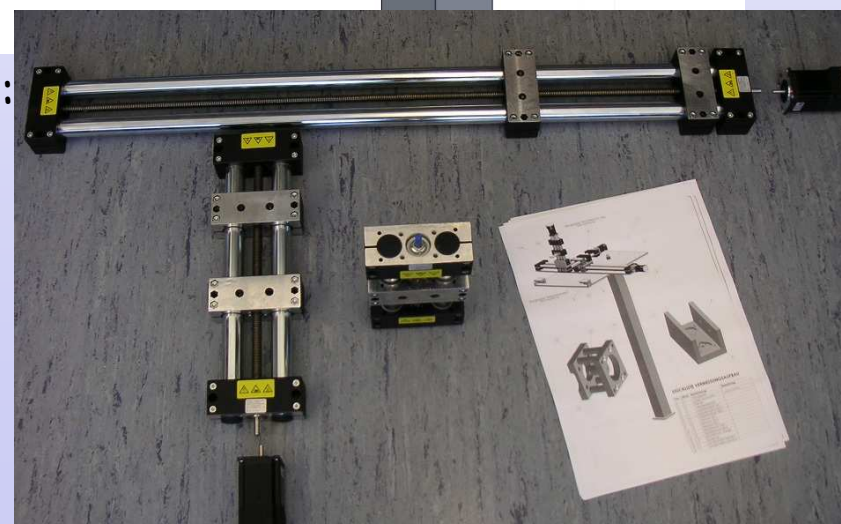
- pressure stabilization test setup:
 - exhaust control of a chamber connected to pressurized air
 - Δp to setpoint ≈ 10 mbar
- stabilization: $\Delta p_{\text{stab}} = 0.48$ mbar (FWHM)



prerequisite for future use of trap with highly charged ions:
q/A separator



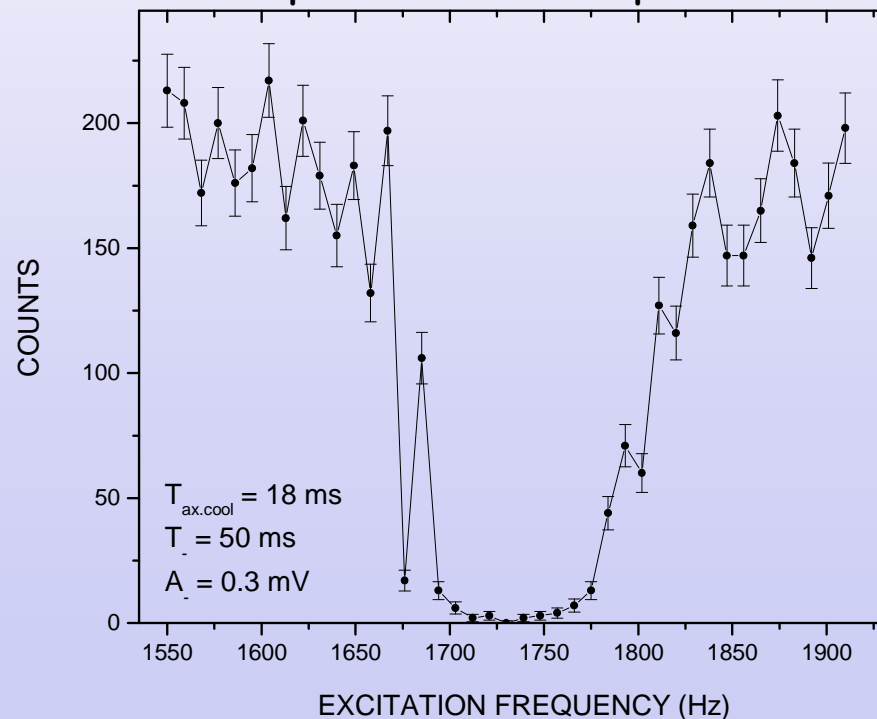
- fast cycling magnet:
(0 - 1.2 T in 50 ms)
- laminated yoke:
(0.5 mm, SigmaPhi)
- round pole tip
(diam. 250 mm)



➤ surface ionization source refilled with isotope mix:

- different alkali ions (^{39}K , $^{85,87}\text{Rb}$, ^{133}Cs) available
- > prepare for measurements of systematic mass-dependence
- new operational parameters of source had to be found

- magnetron resonance in the purification trap:





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Dieter Habs

Veli Kolhinen

Kevin Krug

Andreas Malecki

Robert Meißner

Jurek Szerypo

Christine Weber



Walter Carli