

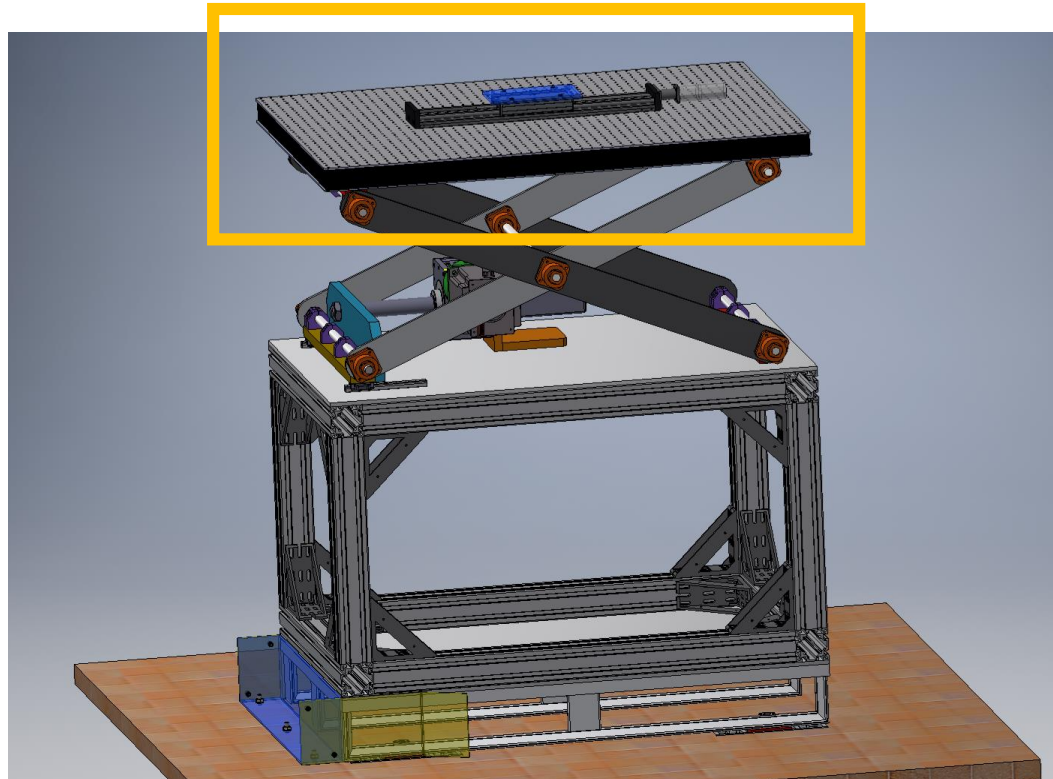


FlexiProb sample environment for neutron scattering experiments on polymer thin films

Lucas Kreuzer, Tobias Widmann, Peter Müller-Buschbaum

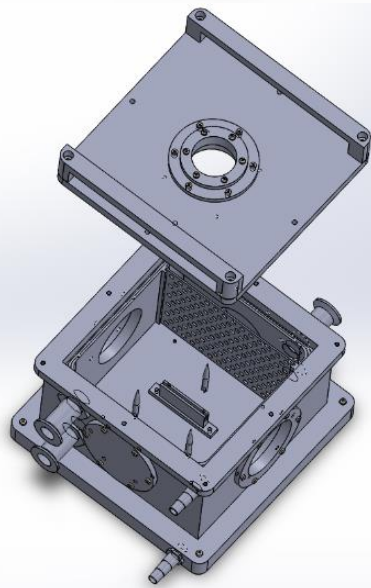
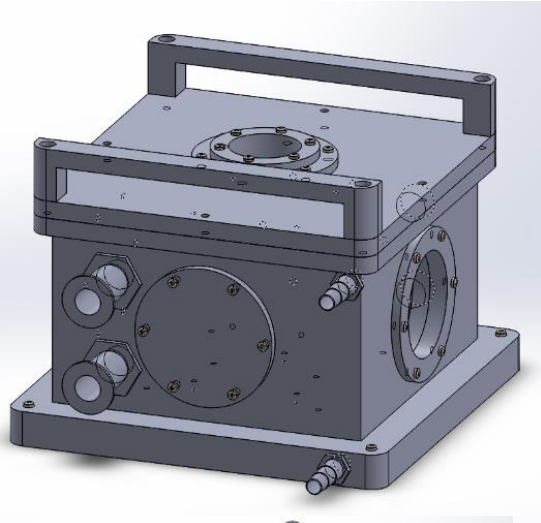
TU München, Physik Department, Fachgebiet Physik weicher Materie, Lehrstuhl für Funktionelle Materialien

Entire setup



- Perforated plate
- Sample environment (on goniometer)
- Equipment: additional measurement devices, gasflow, supplies, etc.

Sample environment

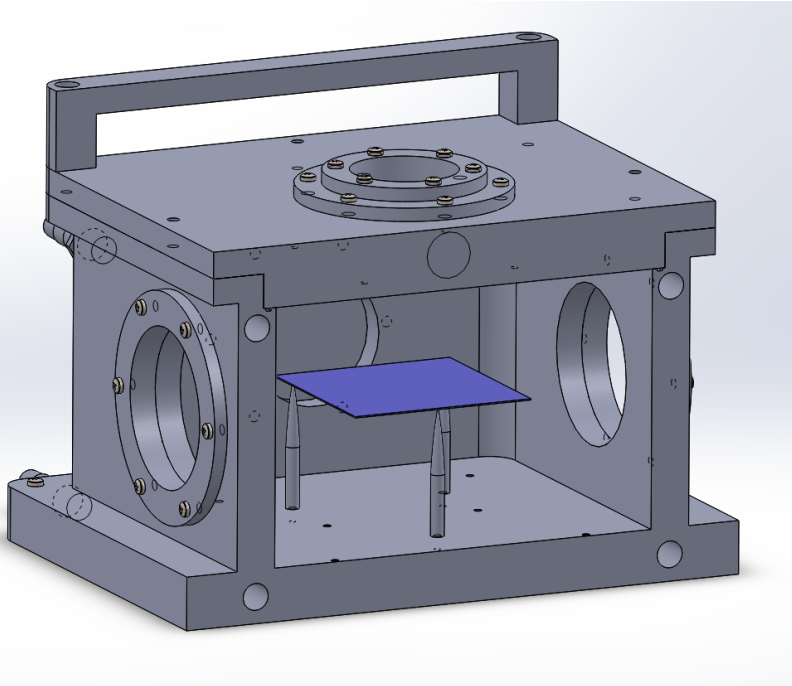


- Horizontal and vertical sample positions possible
- Vacuum access
- 3D heating/cooling → prevent temperature gradient
- No reservoir, atmosphere is adjusted via external gasflow
- Additional equipment: WLI, UV-Vis
- Additional triggers: light (LEDs), organic atmospheres
- Conductivity measurements through sample holder
- Different sample sizes measurable
- Rounded edges and corners → prevent condensation

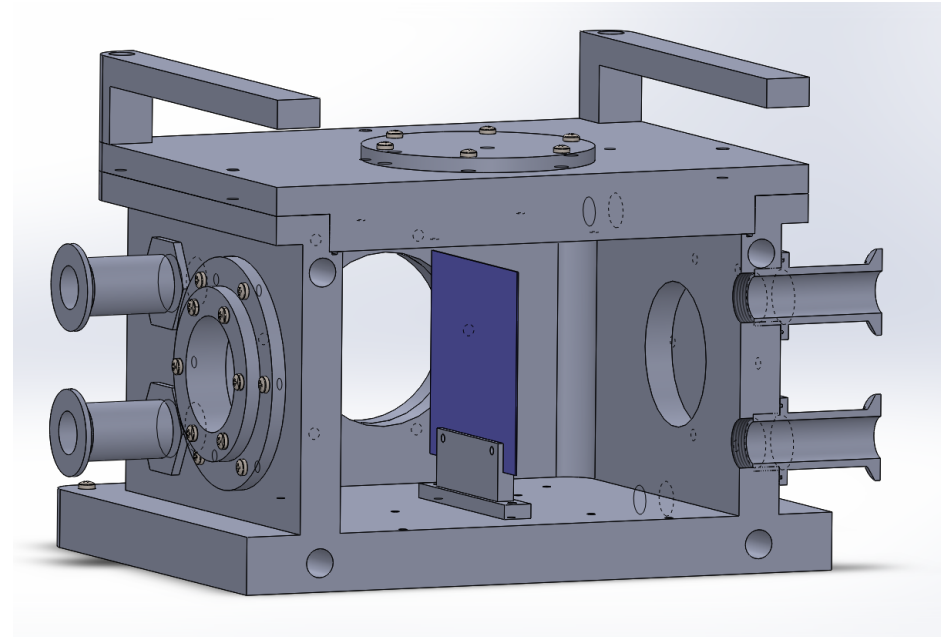
- Flexible sample environment
- Straightforward structure

Sample environment: vertical and horizontal sample positions

horizontal

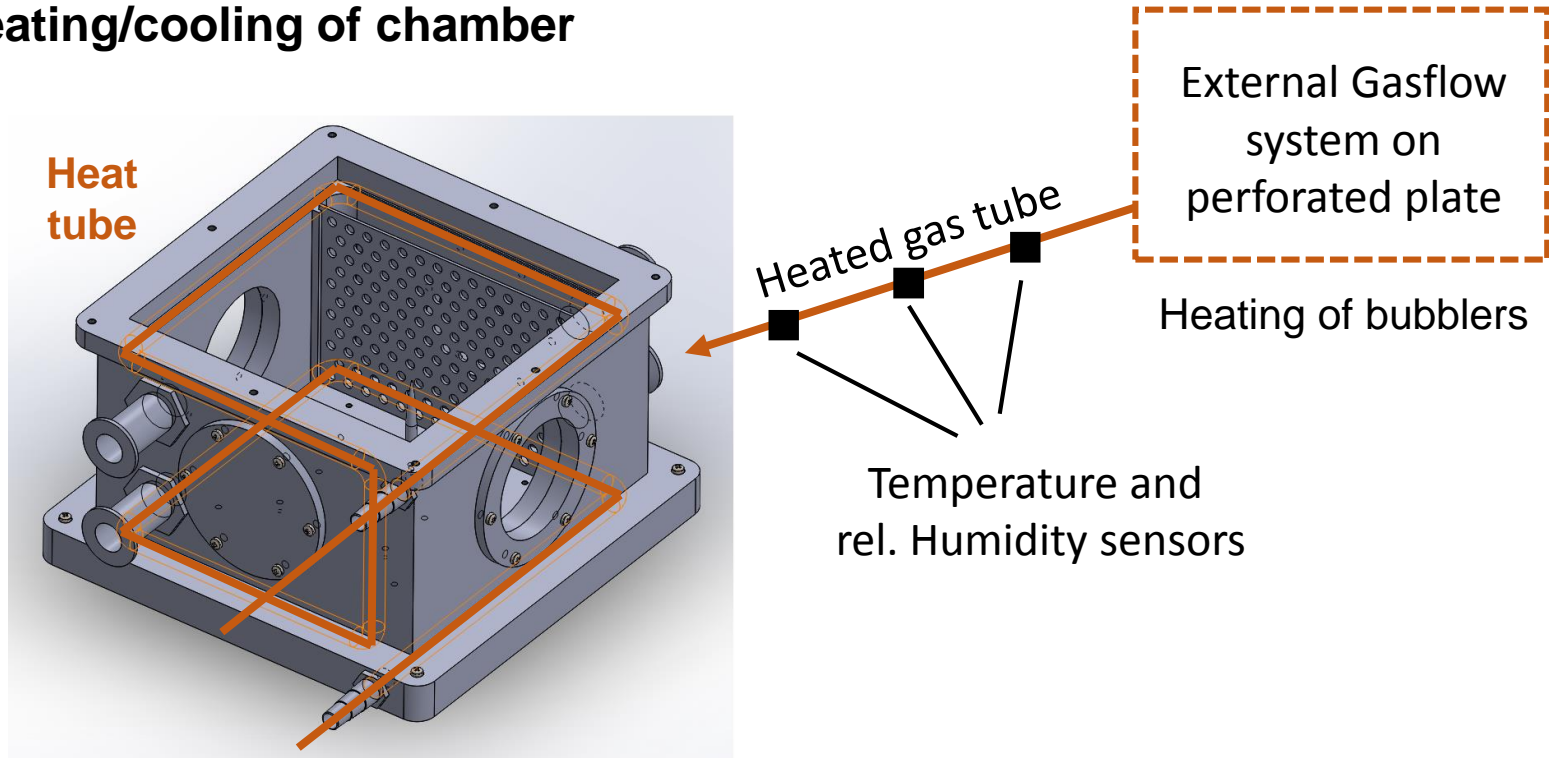


vertical



Simultaneous WLI / UV-Vis measurements possible at both sample positions

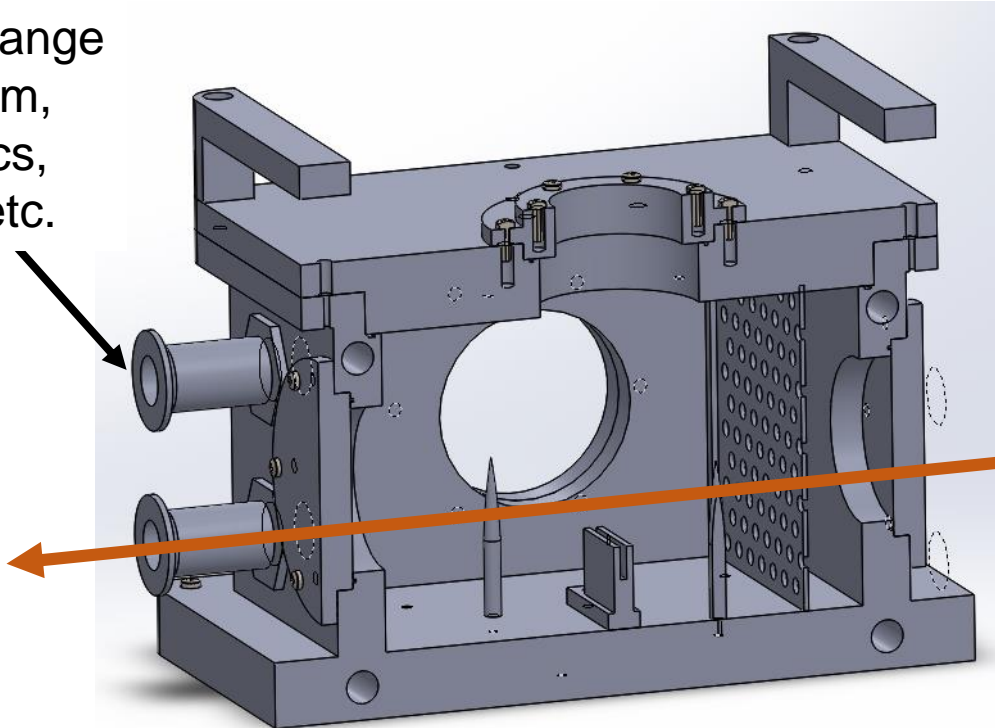
3D heating/cooling of chamber



- Avoid temperature gradient and condensation
- Heated bubblers and/or heated gas tube (including T and rel.H sensors)

Inside chamber

Additional flange
for vacuum,
electronics,
sensors etc.



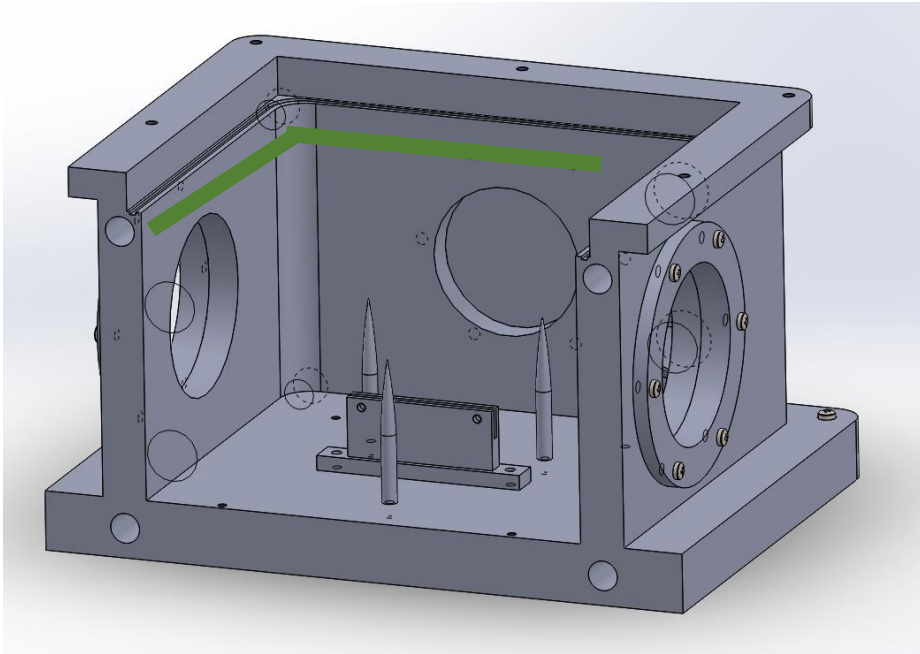
Tempered gasflow (grid
for consistent
atmosphere)

Horizontal (pins) and vertical sample position

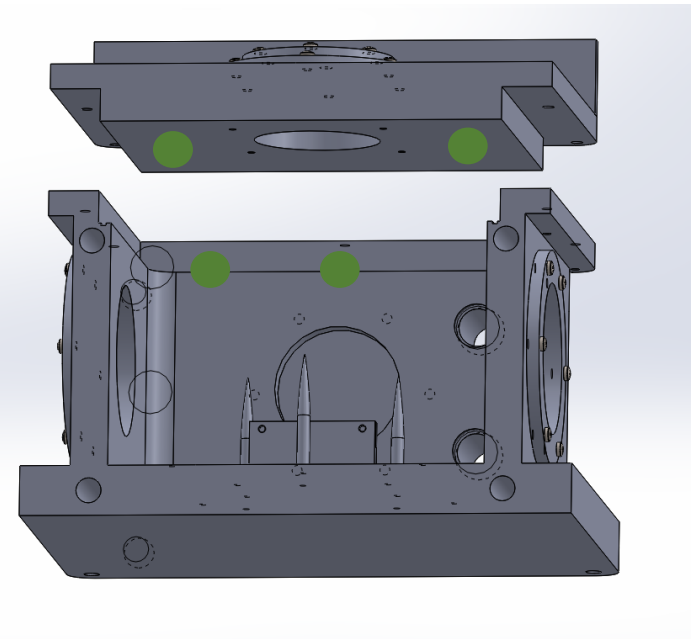
Integration of features without affecting the experiment

Inside chamber: light trigger

LED band (blue, green, red) along chamber walls

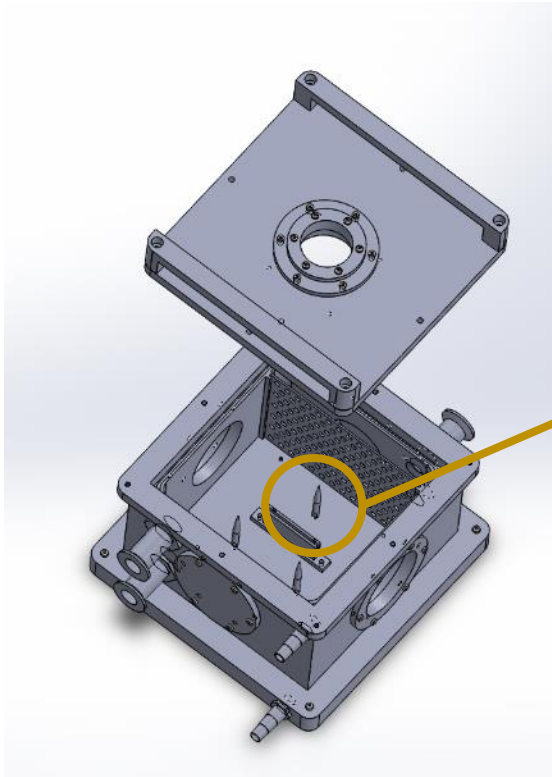


Single LEDs in corners/sides of chamber or at the lid

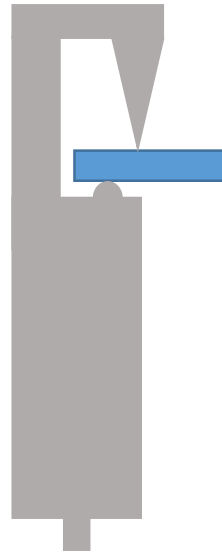


Decision about position of light trigger not made yet

Sample holder



Scheme sample holder



- Is it realizable?
- Distance between measurement points?
- How easy is the sample exchange?
- Impact on neutron scattering?

Enables conductivity measurements and more stability without affecting the experiment



Summary

- Flexible sample environment
- Enables stable running experiments

Challenges

- Details for the presented design (LED, conductivity measurements, etc.)
- Realizing fast sample change
 - Multi-chamber design
 - Rack-like sample holder



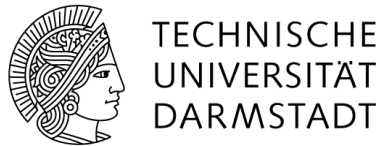
Acknowledgments

Harald Schneider
Arno Hiess



Dr. Sebastian Jaksch
Dr. Henrich Frühlingshaus

Prof. Dr. Thomas Hellweg
Dr. Andreas Schmid
Yvonne Hertle



Prof. Dr. Regine von Klitzing
Matthias Kühnhammer

Prof. Dr. Peter Müller-Buschbaum
Tobias Widmann

