

\bar{P} ANDA Cluster-Jet Target, Glass Nozzles, and Dynamic Thickness Control

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\bar{P} ANDA Meeting Darmstadt, September 8th 2015

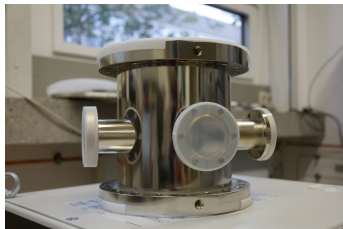


Bundesministerium
für Bildung
und Forschung



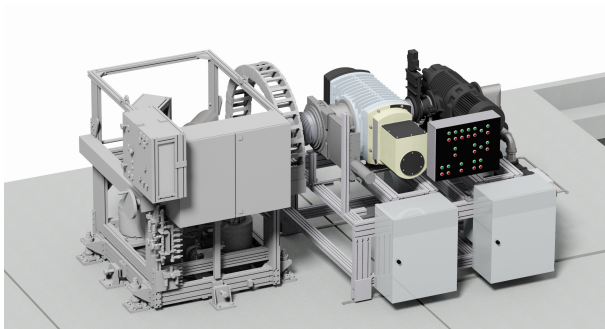
Status of the \bar{P} ANDA Cluster-Jet Target

- Status of electrical installation: Talk of B. Hetz
- Scattering chamber and beam pipe finished
→ Ready for installation at the ceiling
- Integration of final pumping station with the target within the next few weeks
→ Cluster beam production



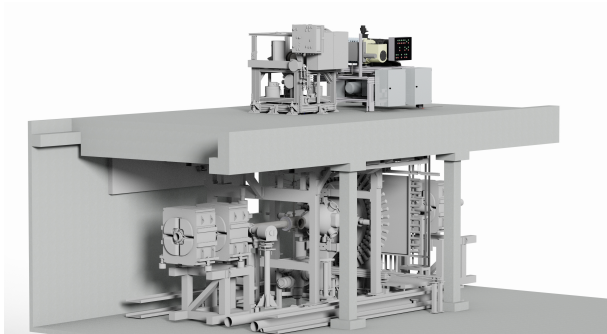
Future of the \bar{P} ANDA Cluster-Jet Target

- \bar{P} ANDA cluster-jet target moves to COSY (Jülich)
- Measuring station: WASA
- Assembly in 2. shutdown phase (spring 2016)



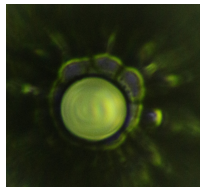
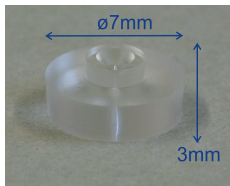
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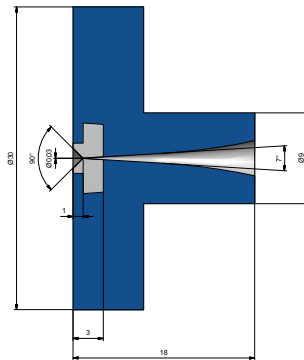


Glass Nozzle

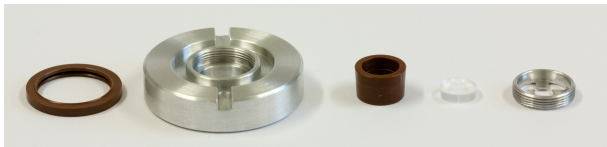
Selective laser etching of glass



- Microscopic view of the narrowest inner diameter of about $30\ \mu\text{m}$



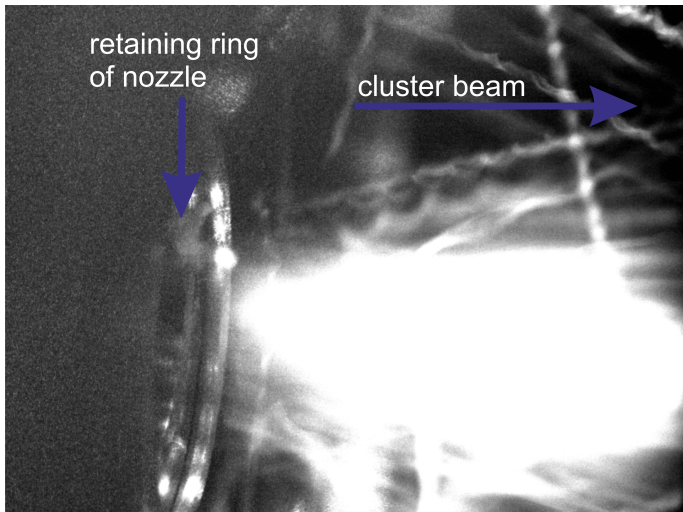
Sealing of the Glass Nozzle



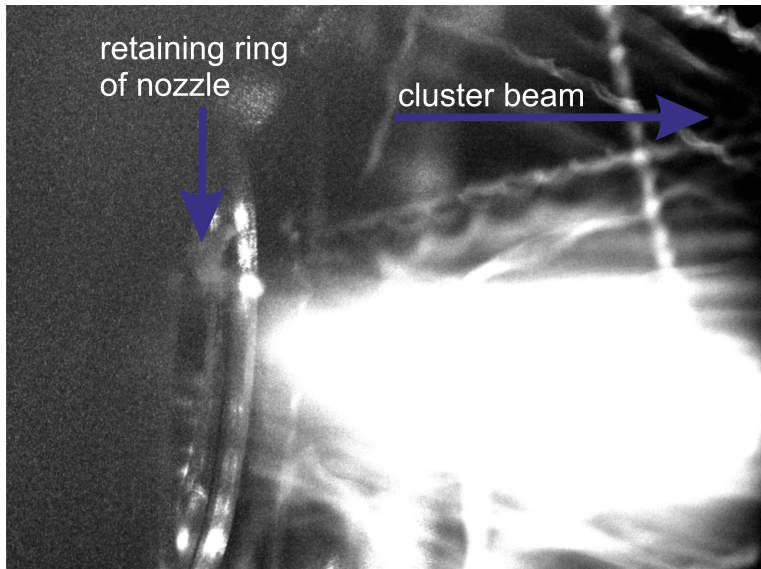
- Vespel[®] is an excellent alternative for indium for sealing (even for the CERN nozzles)
- Cooling test with 18 bar helium down to 19.5 K successful

Initial Measurements with new Nozzles at the \bar{P} ANDA Cluster-Jet Target Prototype: 25 K, 8 bar

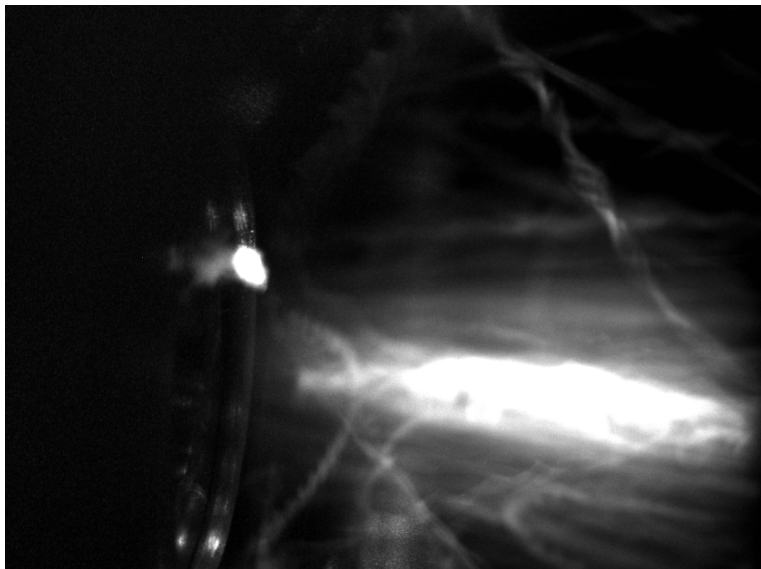
5 cm



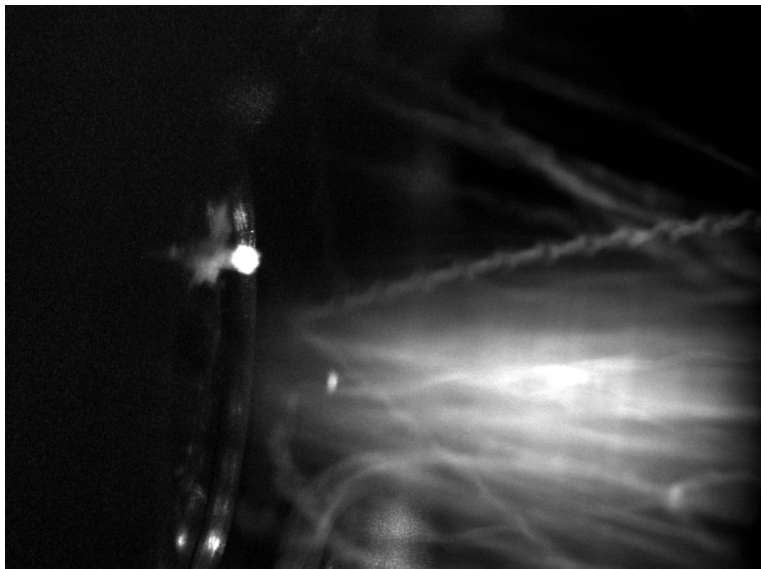
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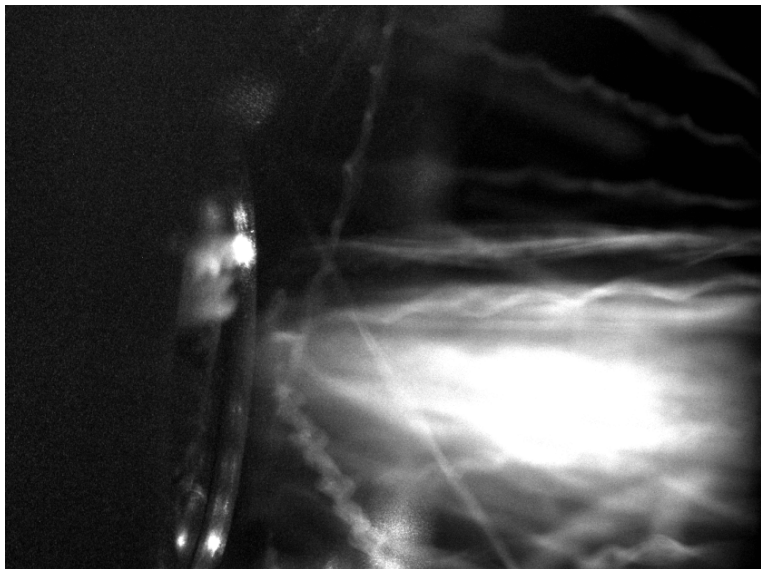
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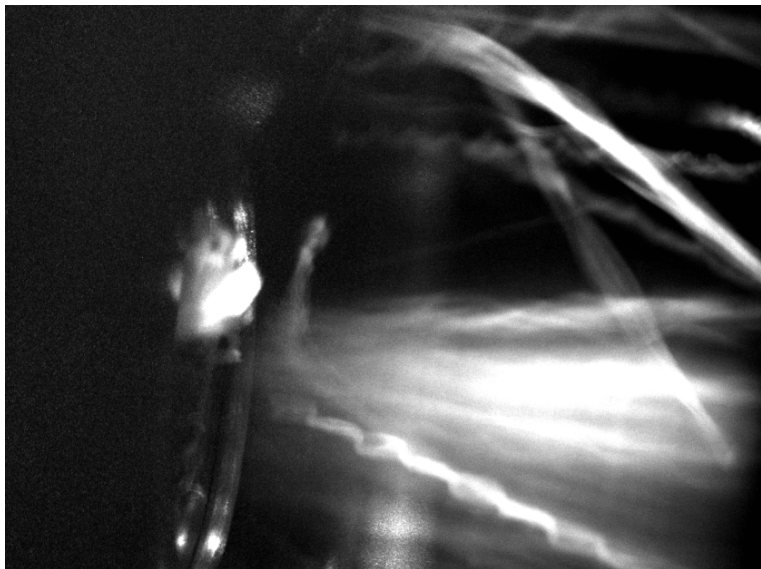
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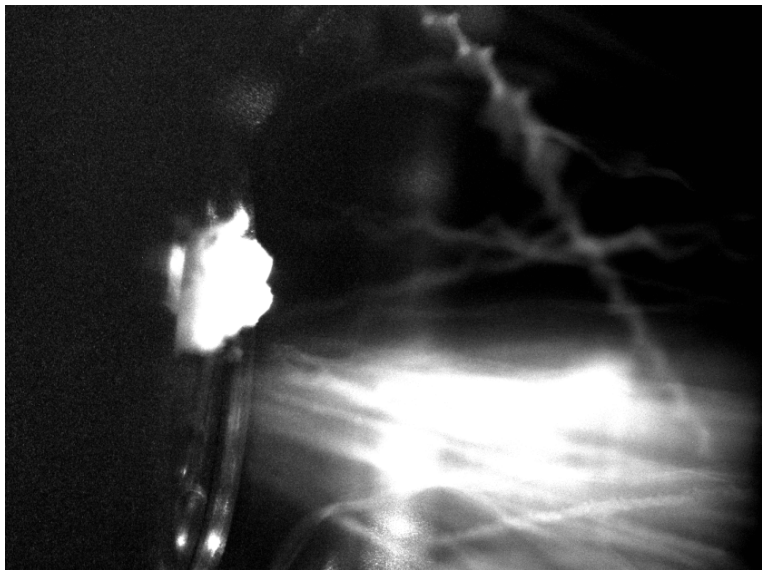
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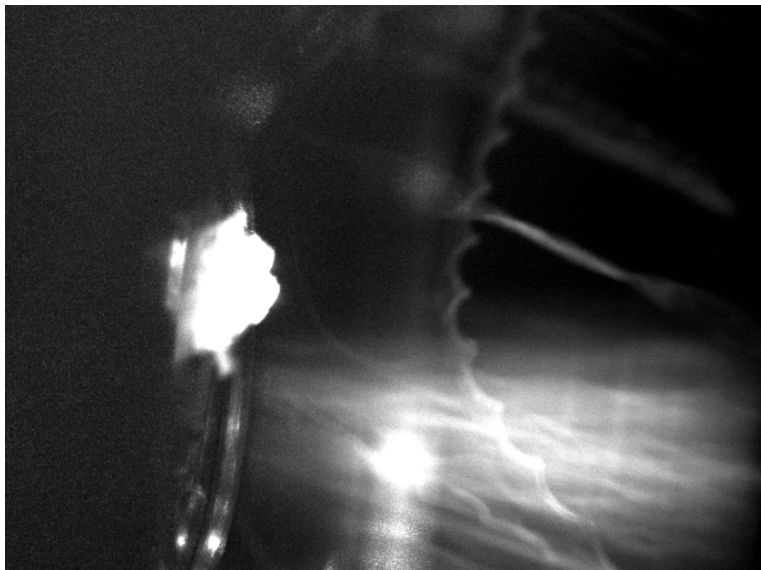
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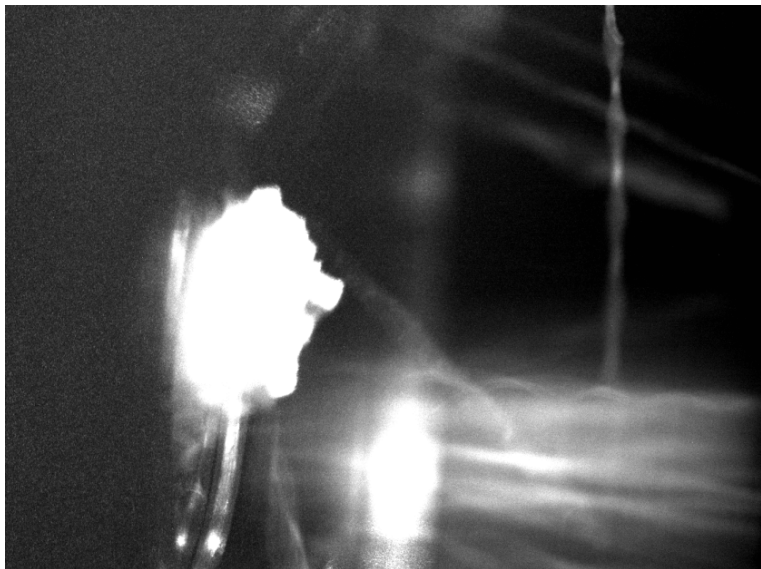
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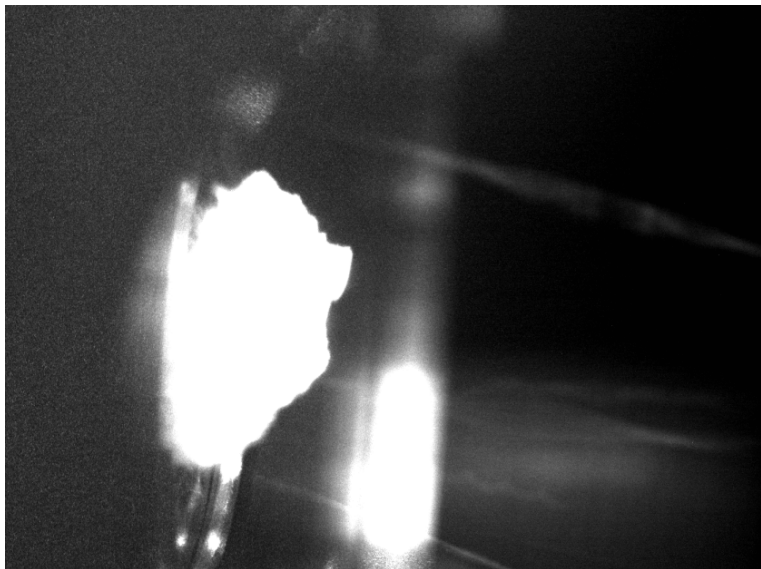
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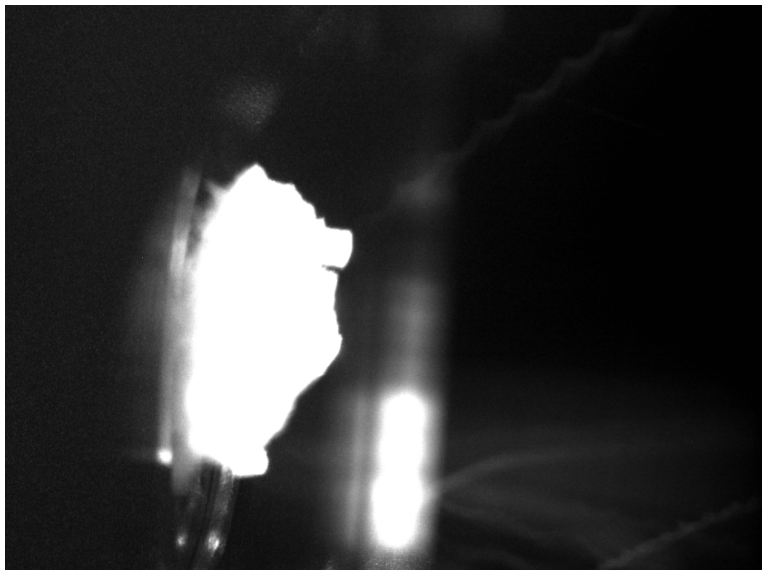
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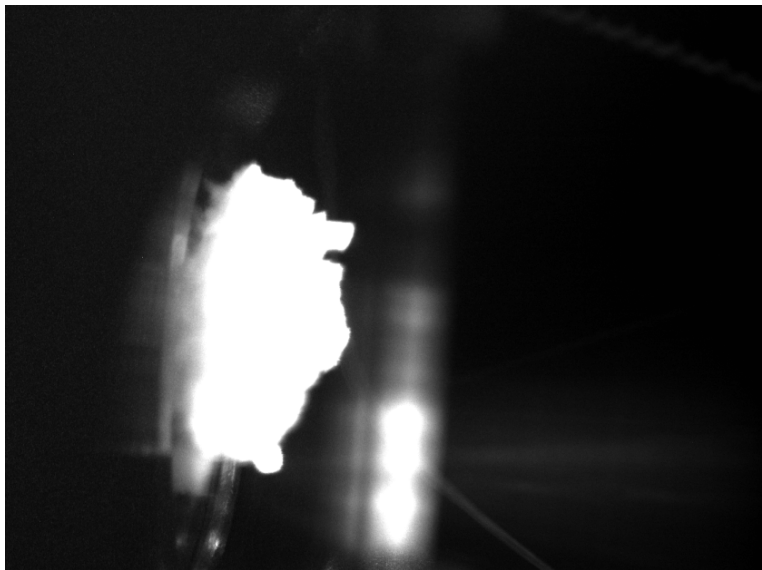
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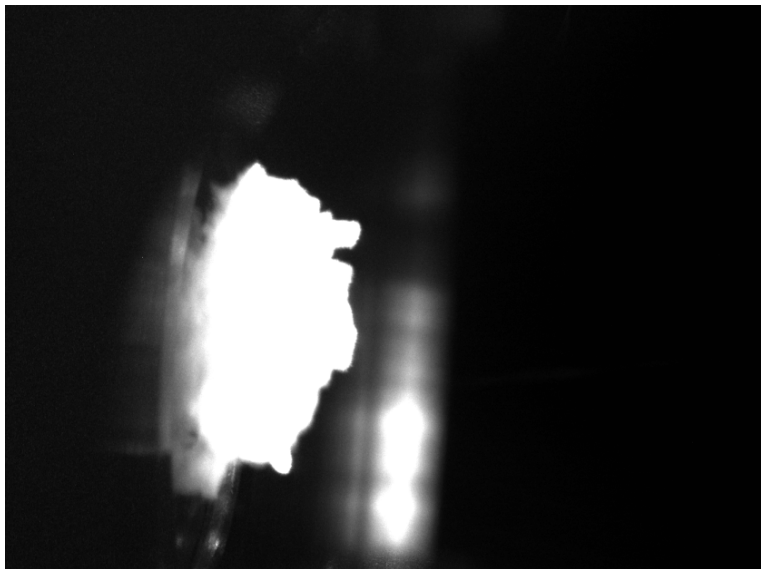
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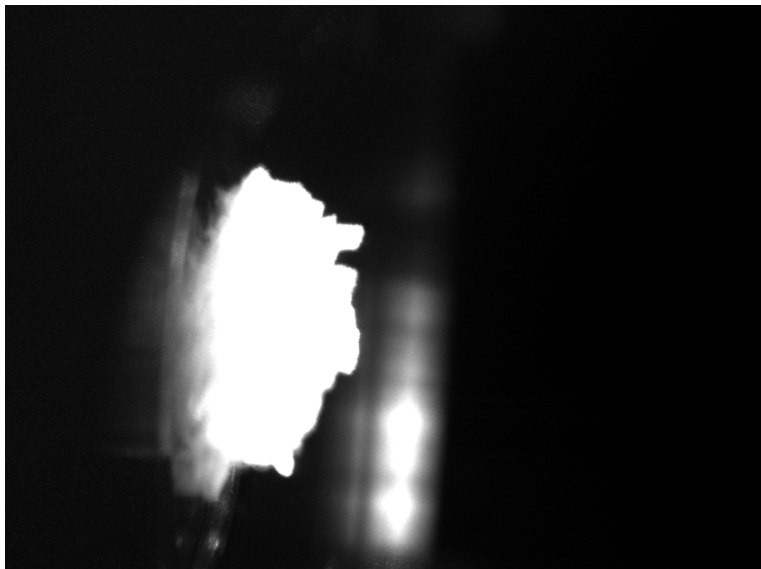
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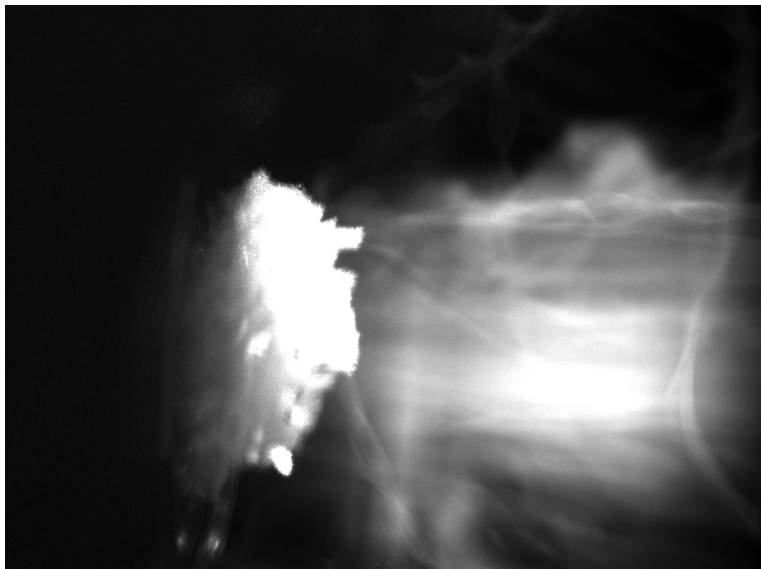
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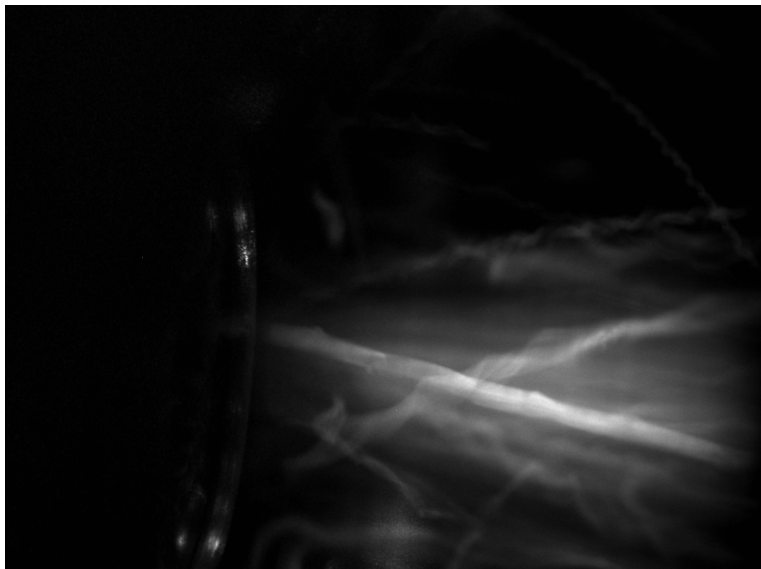
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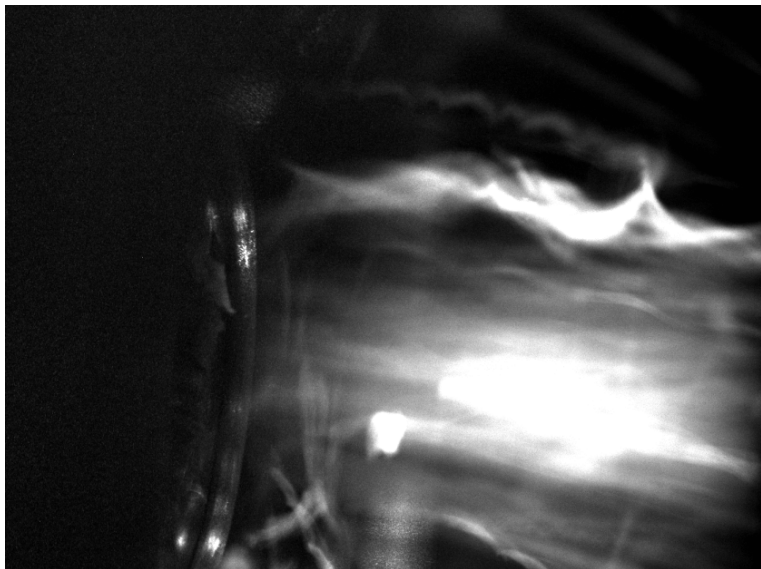
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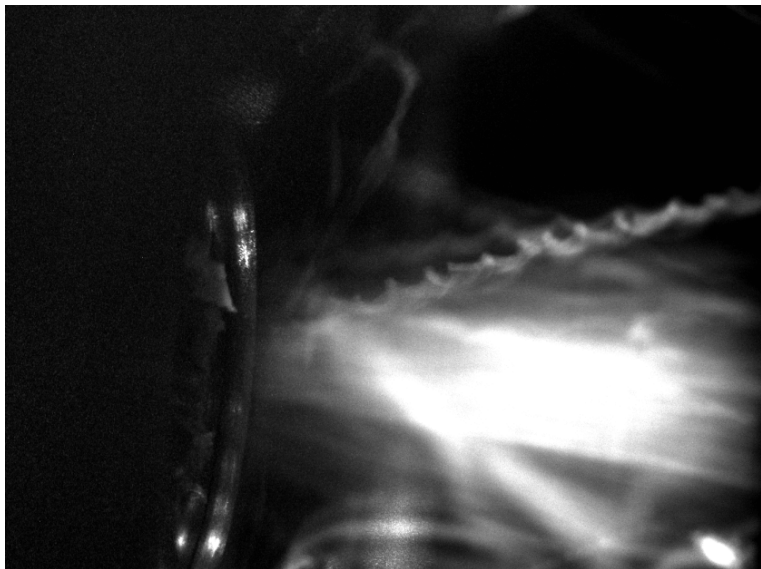
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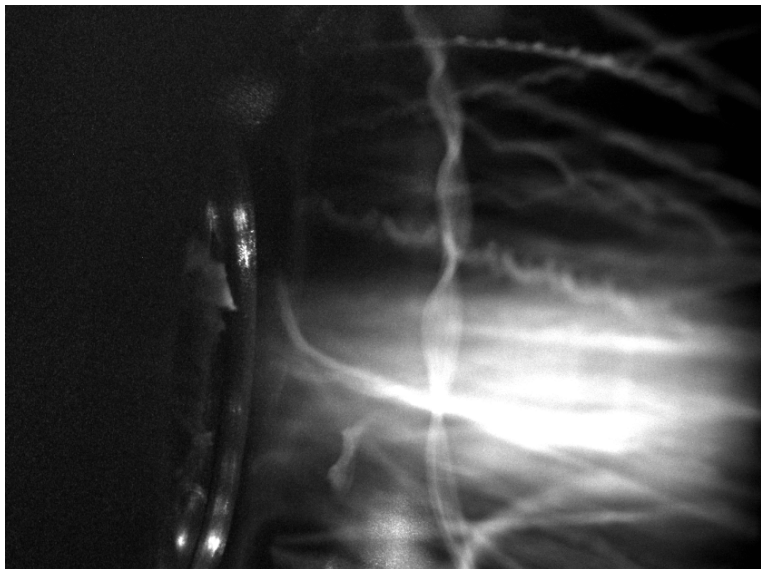
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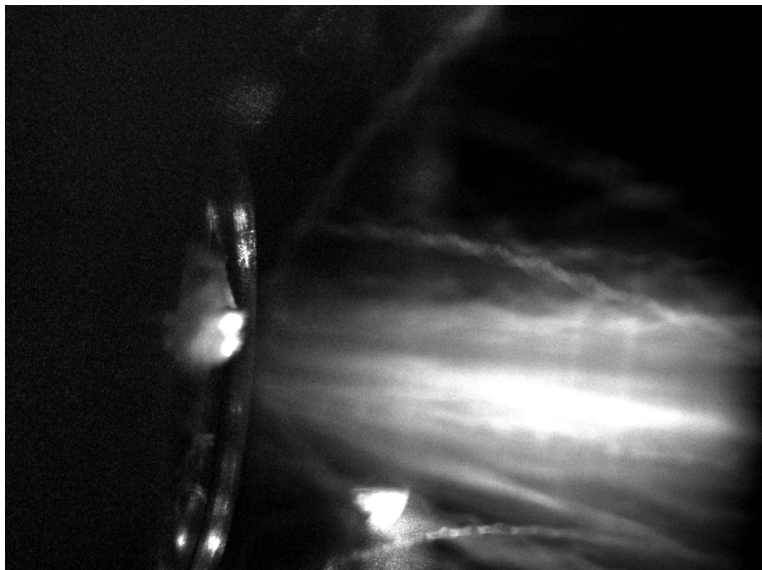
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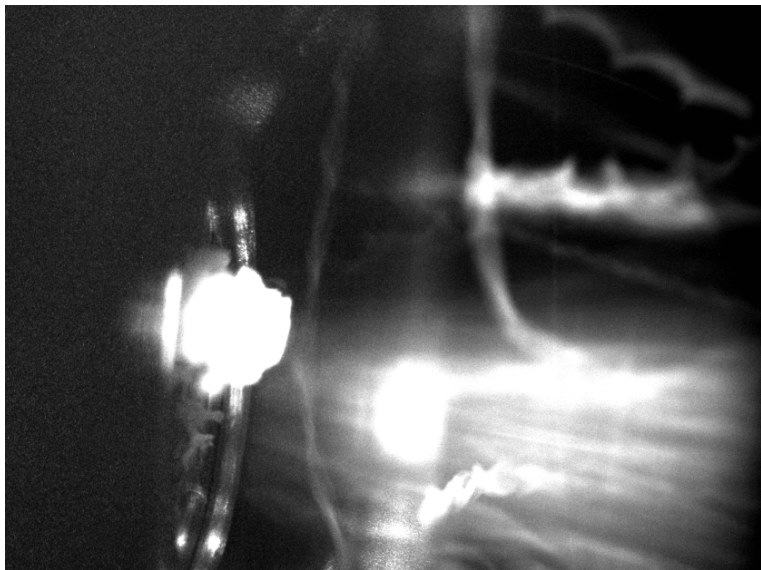
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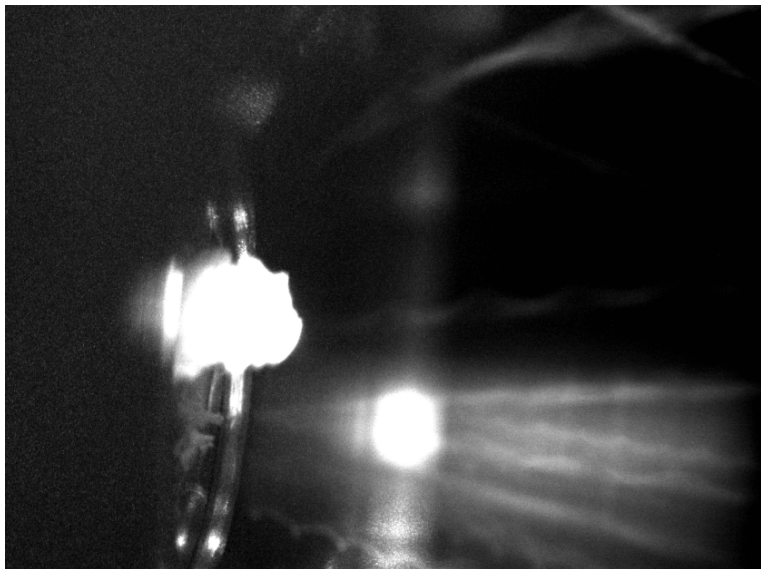
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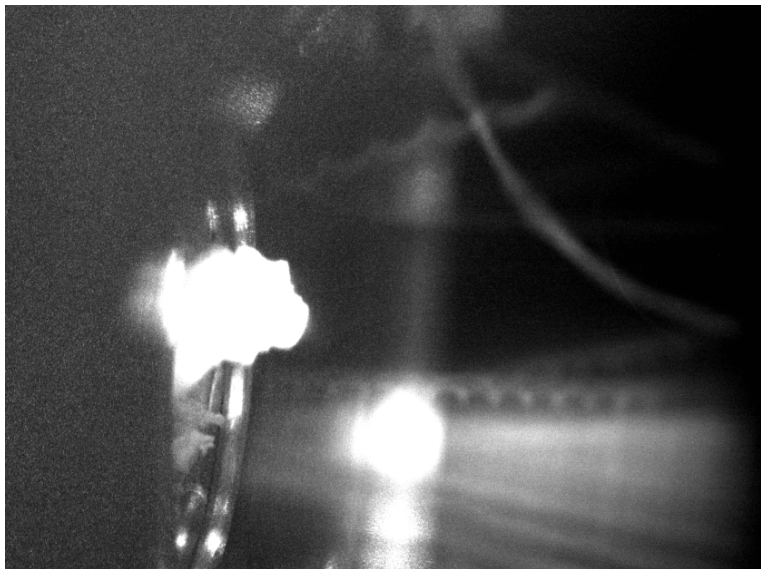
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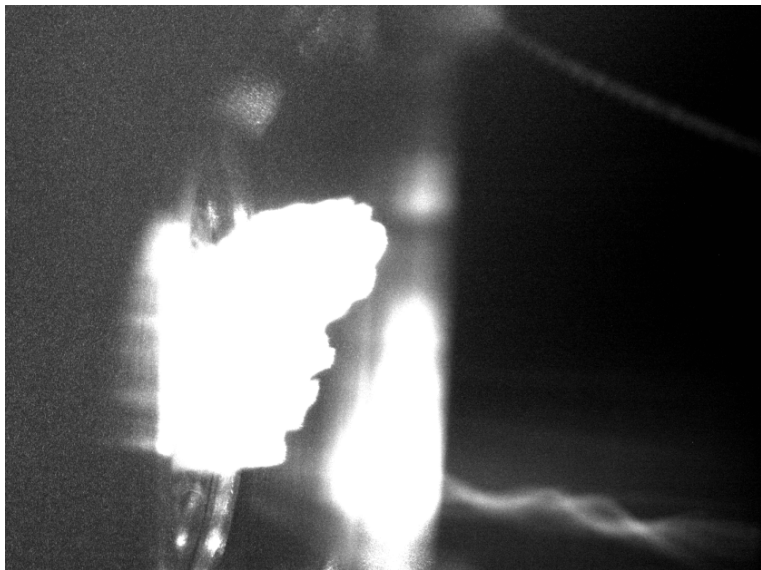
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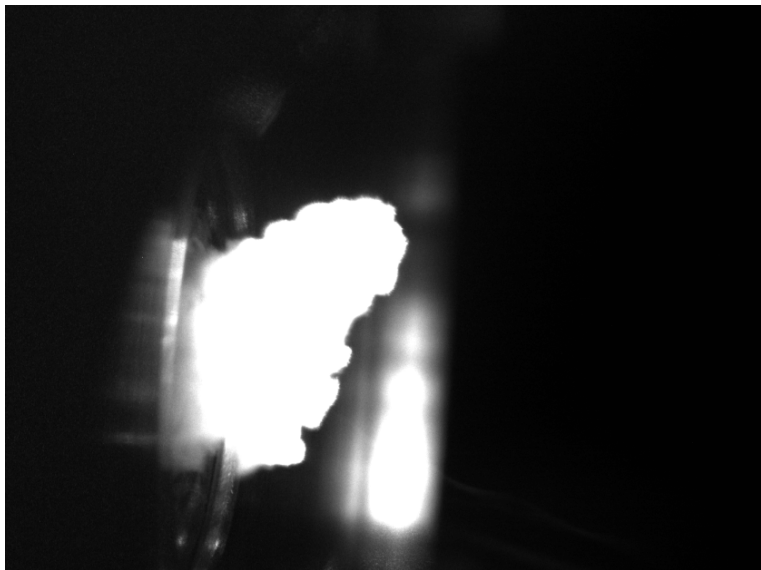
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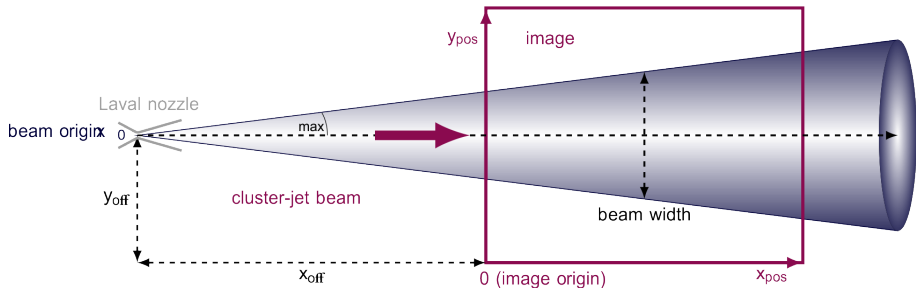


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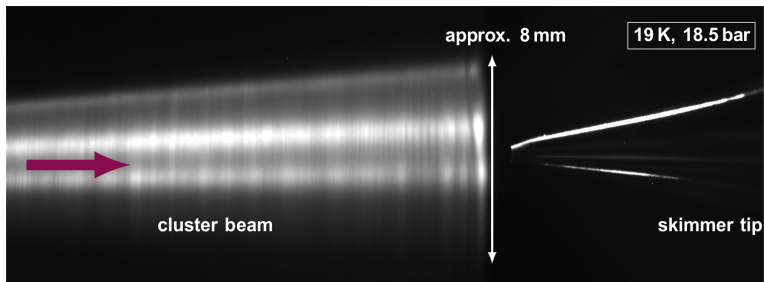


Beam Origin within the Nozzle

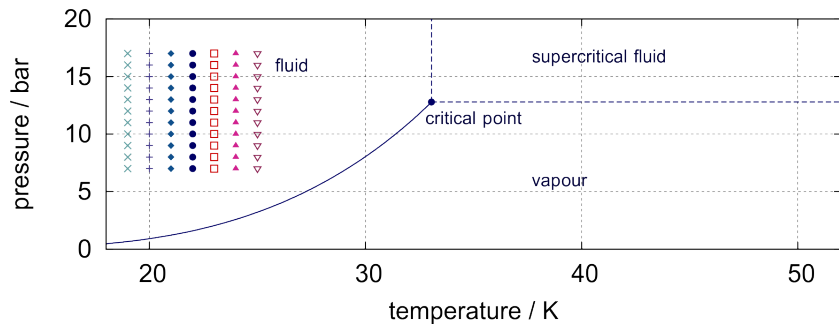
- Beam origin was investigated by E. Köhler (Phd thesis)
- X position-offset yields beam origin



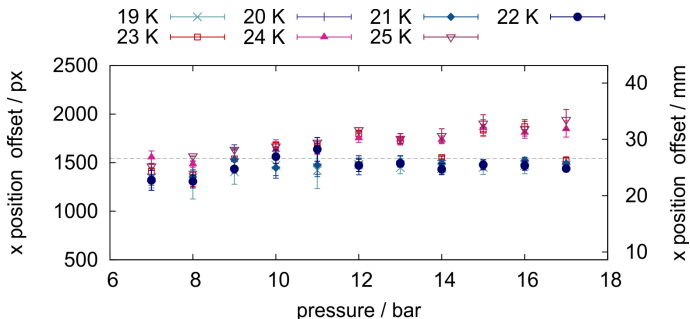
Beam Origin within the Nozzle



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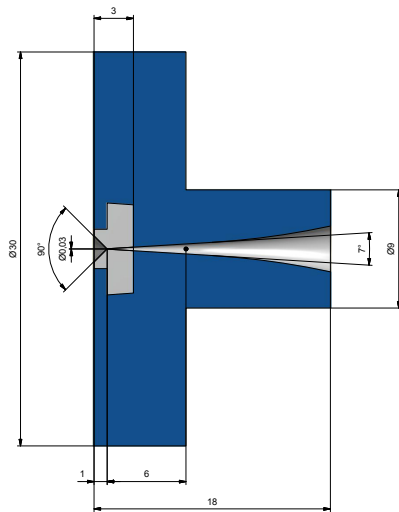


Beam Origin within the Nozzle



- A mean value of $x_{\text{off}} = (1543 \pm 58)$ px
- Distance from the image origin to the skimmer equals $x_{\text{skimmer}} = (1177 \pm 1)$ px
- Beam origin yields $x_0 = (2720 \pm 58)$ px and corresponds to a length of (47 ± 2) mm
- This complies to a distance of around (6 ± 2) mm from the narrowest point of the nozzle

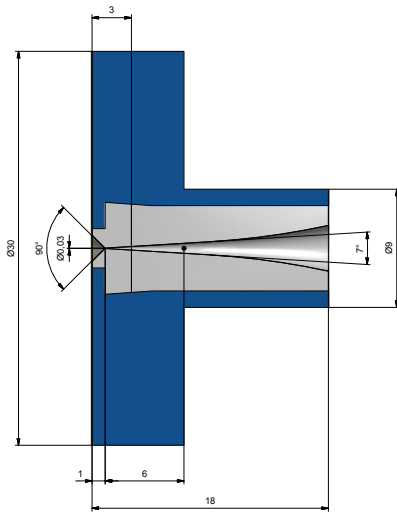
Beam Origin within the Nozzle



Glass Nozzle

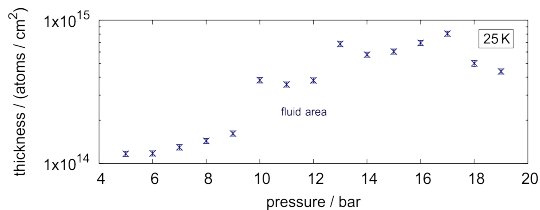
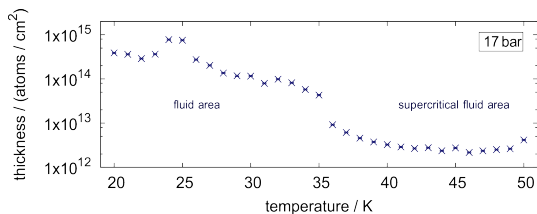
Extension for Glass Nozzle

- Extension for glass nozzle for a longer outlet zone
→ Next week



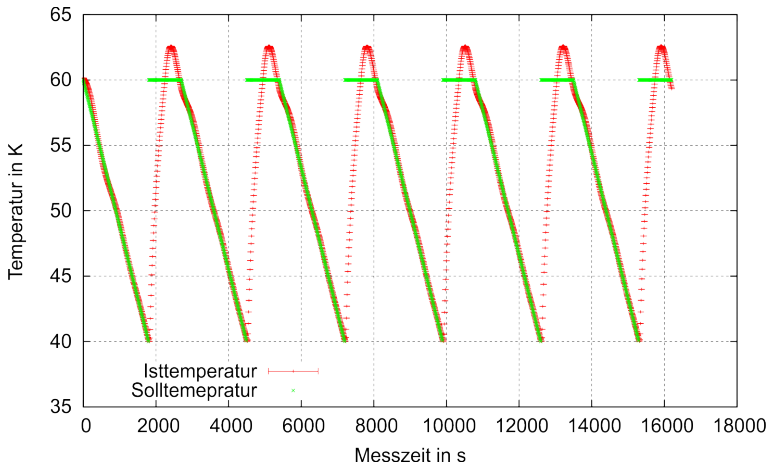
Dynamic Thickness Control

Variation of Thickness



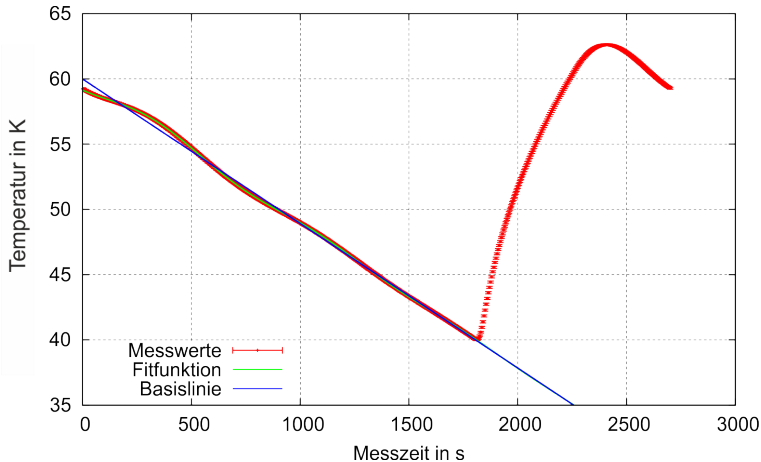
Dynamic Thickness Control

- Preliminary work at the cluster-jet target MCT1S
- Temperature is the regulating parameter
- Overshoot irrelevant → beam preparation & no cluster beam in interaction chamber



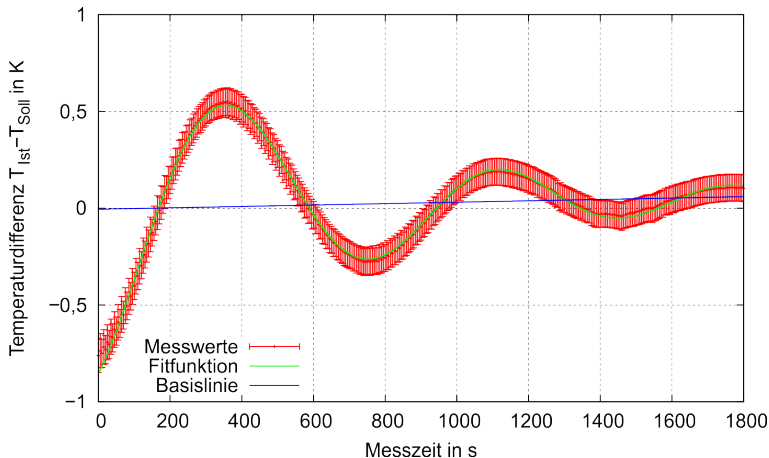
Dynamic Thickness Control

- Measurement over 67 h \rightarrow 90 ramps in a row



Dynamic Thickness Control

- Effects of a PID control system



Summary & Outlook

Summary

- Construction of \bar{P} ANDA cluster-jet target is forging ahead
- Initial measurements with new glass nozzles at the \bar{P} ANDA cluster-jet target prototype
- Beam origin within the nozzle was investigated
- Possibility of dynamic thickness control was successfully shown

Outlook

- \bar{P} ANDA cluster-jet target moves to COSY (spring 2016)
- Extension for glass nozzle and further measurements