

First Investigations on the Cluster Beam Structures Using the Nozzle Tilting System

Benjamin Hetz

Westfälische Wilhelms-Universität Münster, Institut für Kernphysik

March, 1st 2016



- Currently no monitoring system for the final target's thickness available.

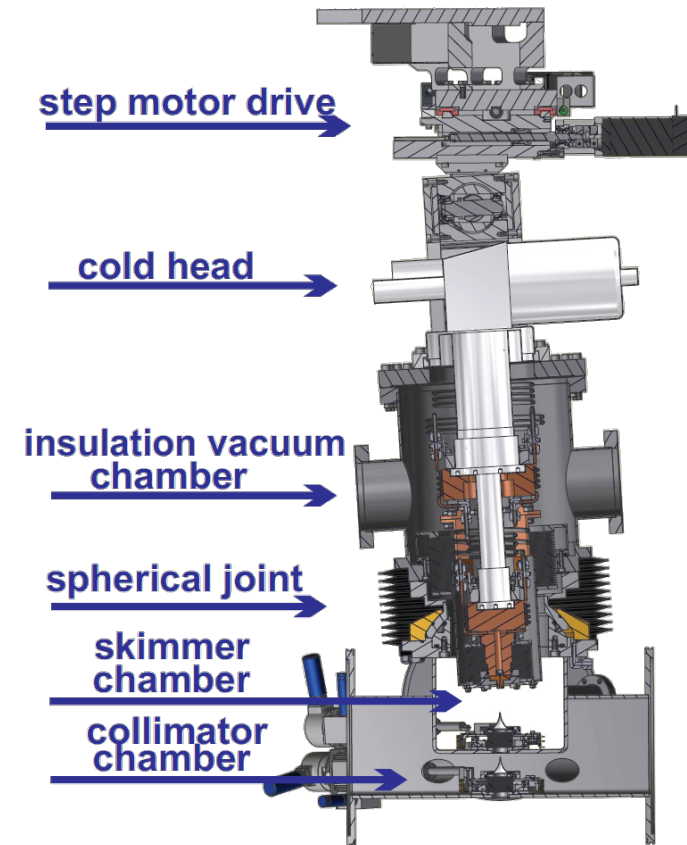
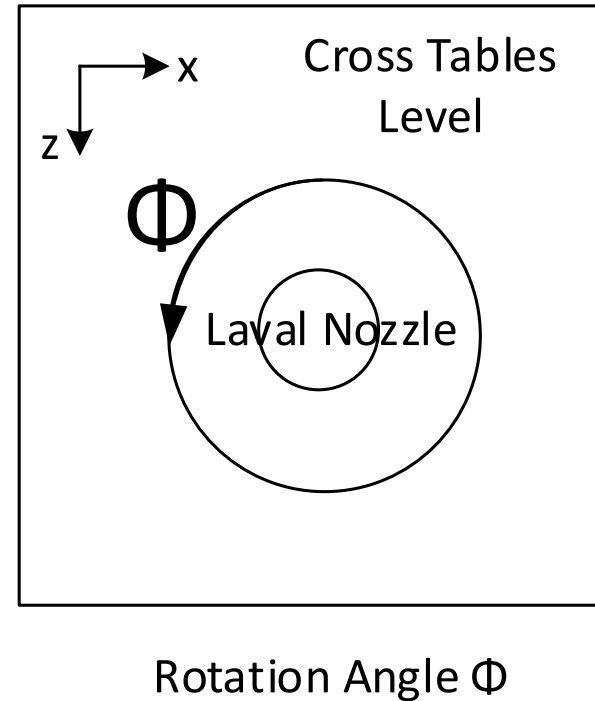
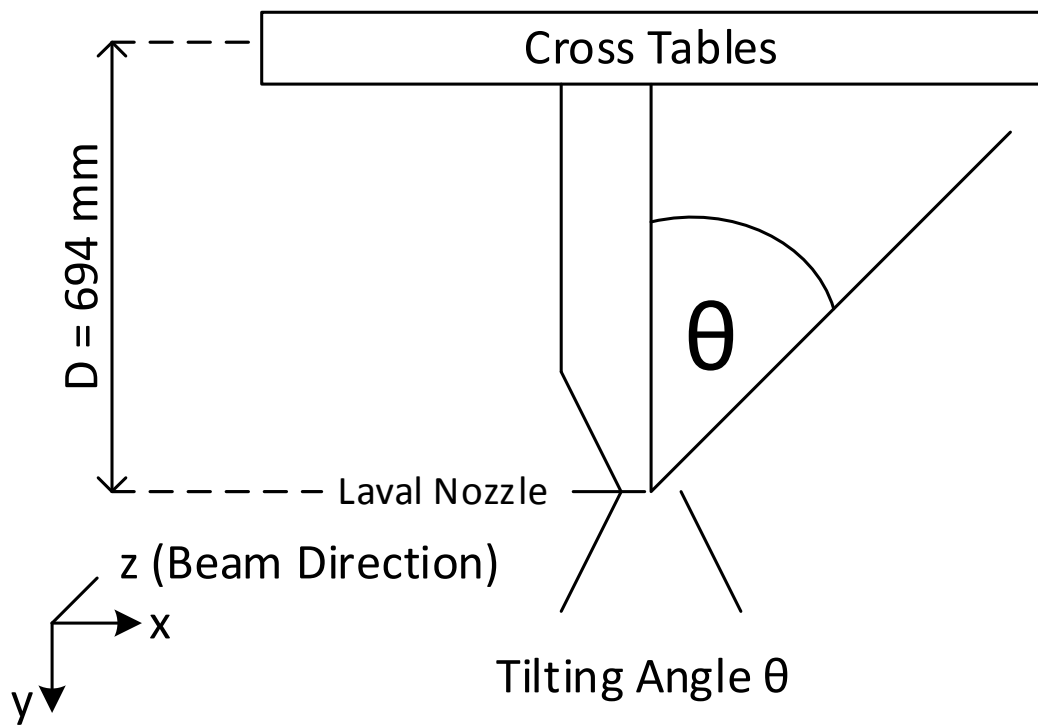
➡ Planned

BUT

- Pressure in the *Interaction Chamber* and the *Collimator Chamber* yield information about the target thickness.

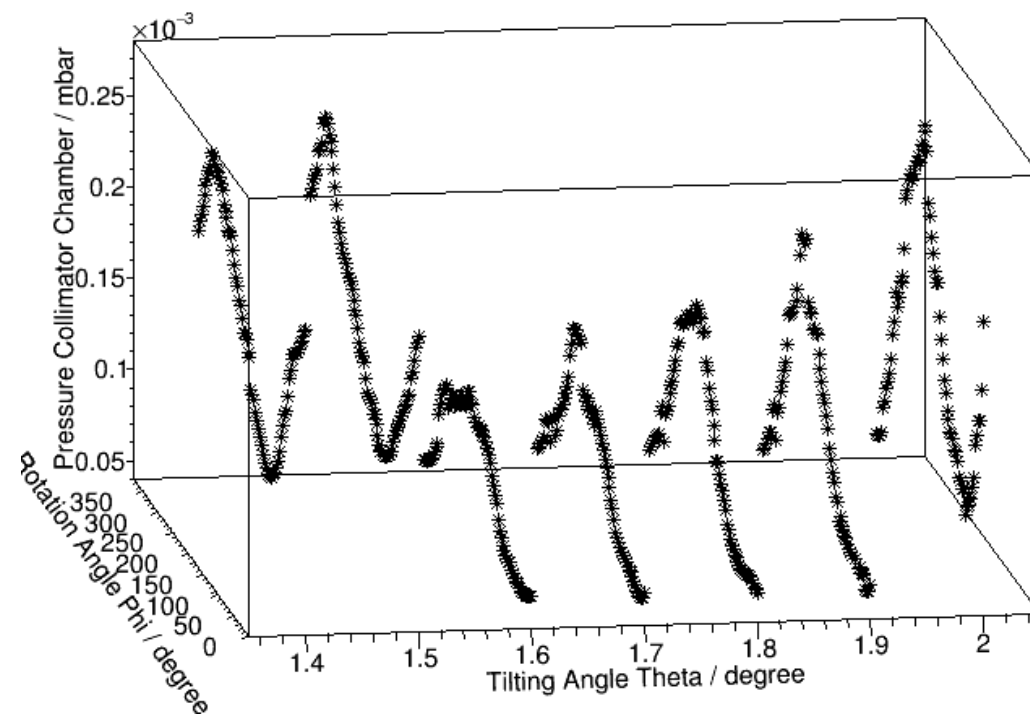
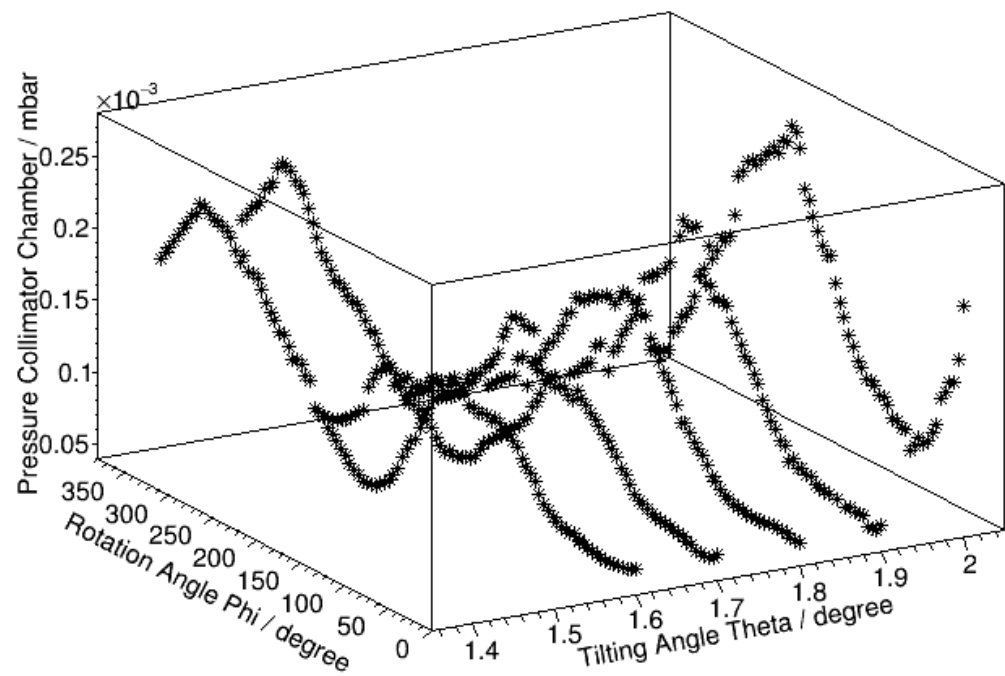
- First investigations on the cluster-jet target's thickness done at:
 - 5 bar
 - 25 Kelvin
 - Using a 50 μm Nozzle.

Schematic of the Nozzle Tilting System

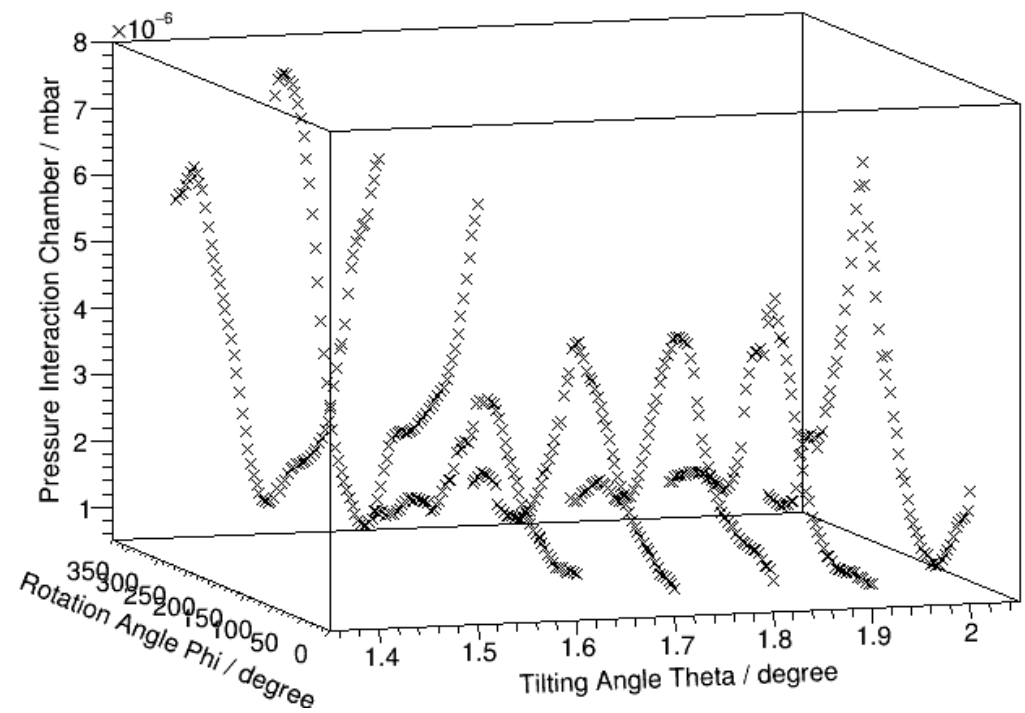
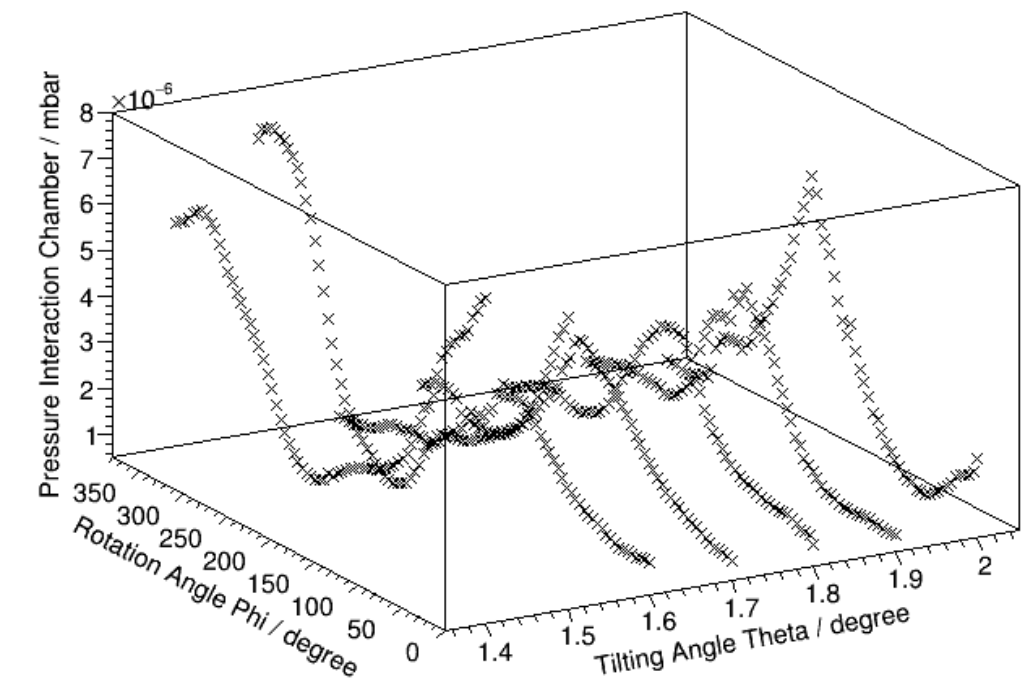


Measuring process:

- Tilting (θ) the Nozzle to a given angle
- 360° rotation of the nozzle tip (Φ)
- Logging the measurands

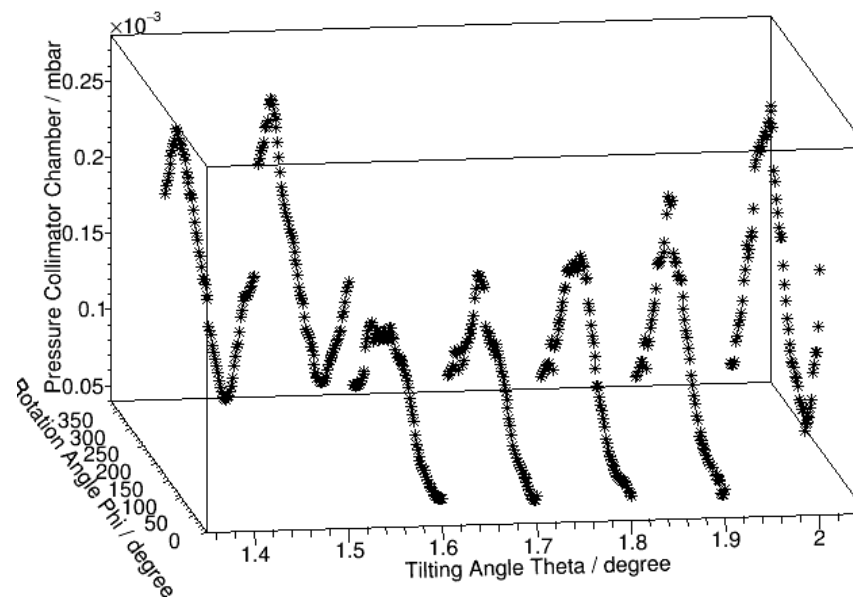
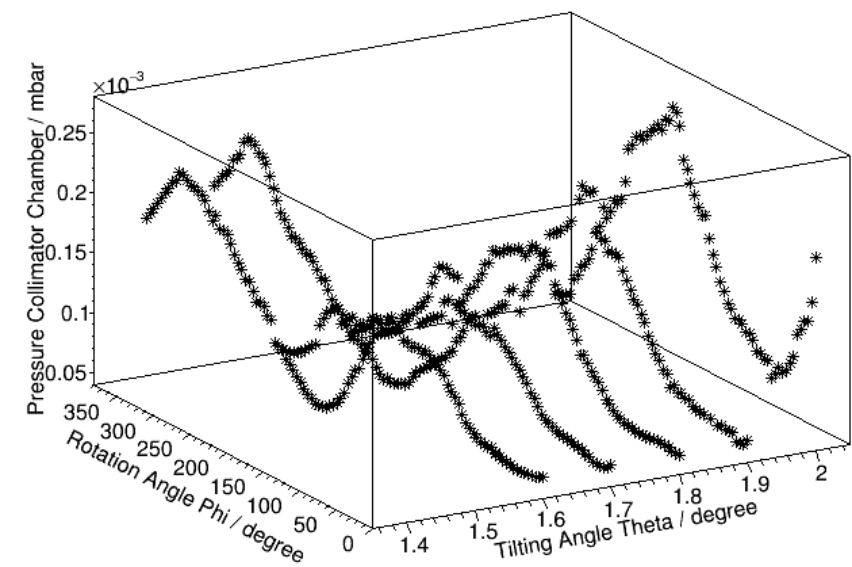


- Constant background (nozzle shutter closed)
 - No background subtraction in plots



- Constant background (nozzle shutter closed)
 - No background subtraction in plots

Line Up of Collimator and Interaction Chamber pressures



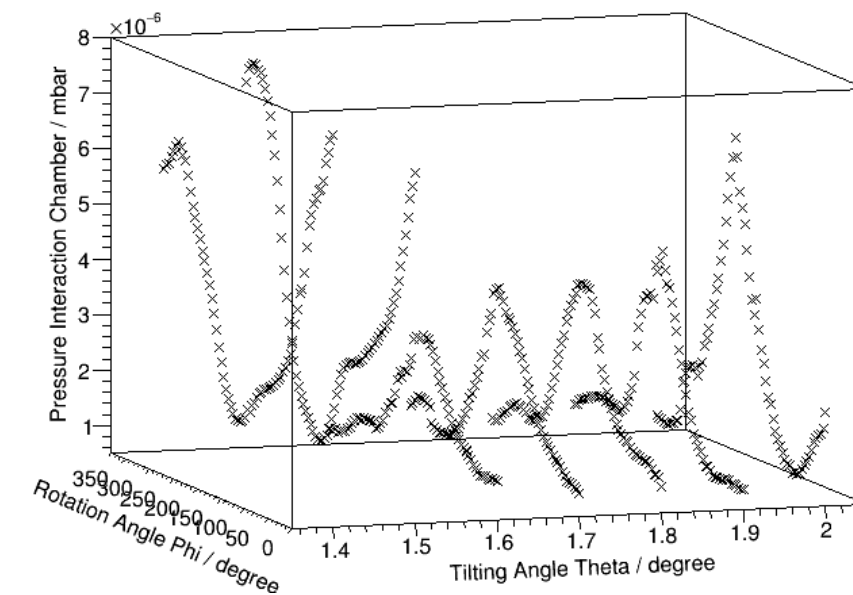
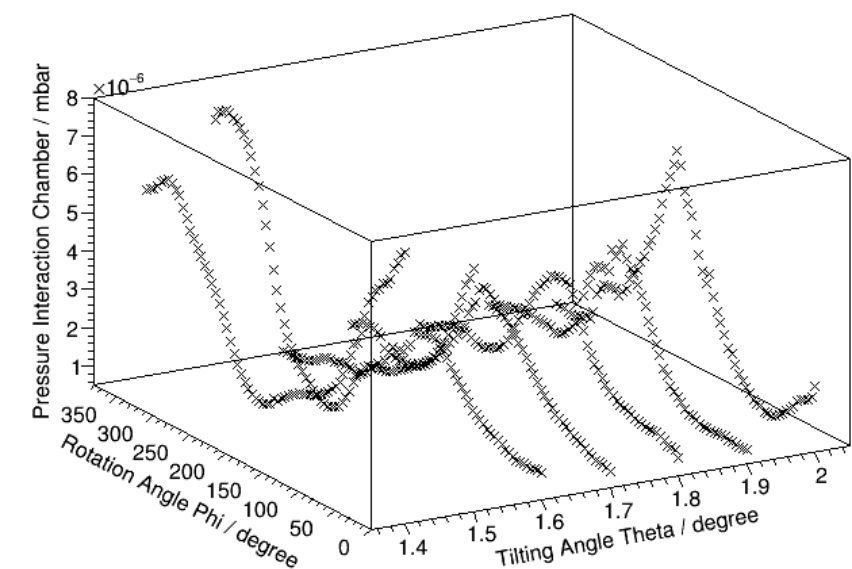
collimator chamber pressure



similar behaviour



interaction chamber pressure



- Beam shape/thickness depend on skimmer and collimator position.
 - Until now: fixed
 - Next: optimization of their relative position
- Higher thicknesses with the final beam dump.
- Different nozzles and investigations on highly intensive core beams.
- Measuring the jet above and under the vapour pressure curve.