

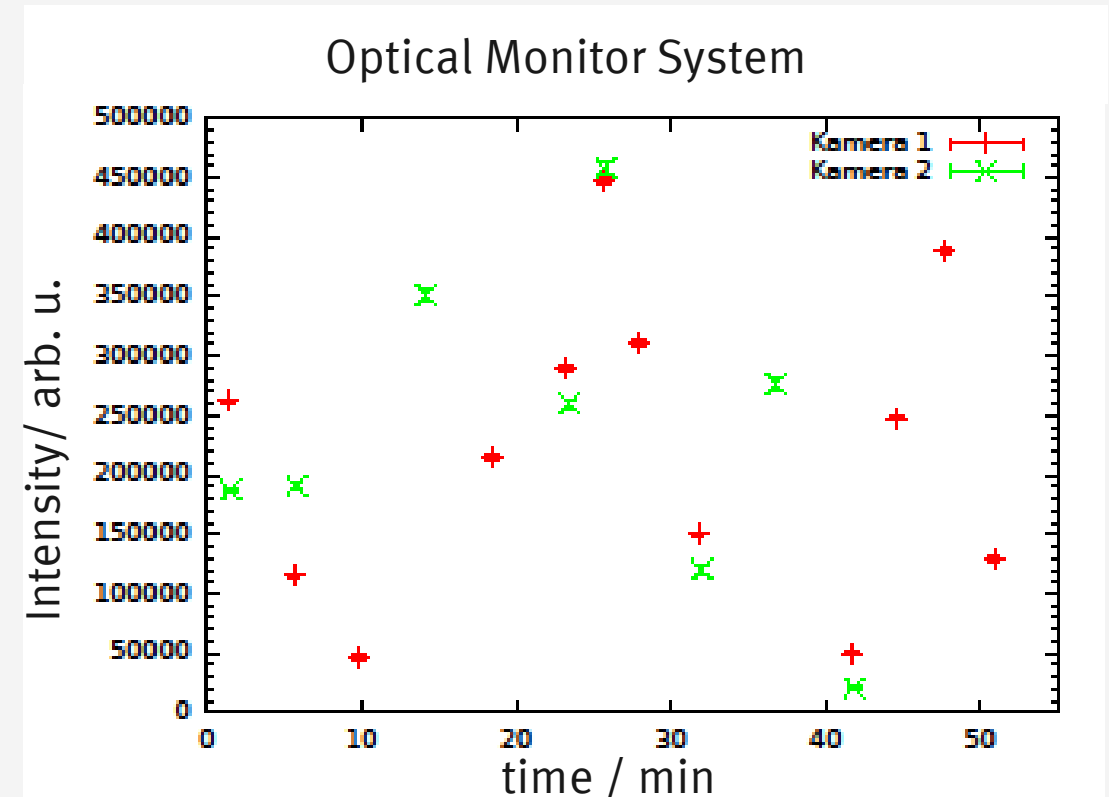
# The Cluster-Jet Target Gas System and Beam Adjustment Status

PANDA Collaboration Meeting 2017/2  
Benjamin Hetz



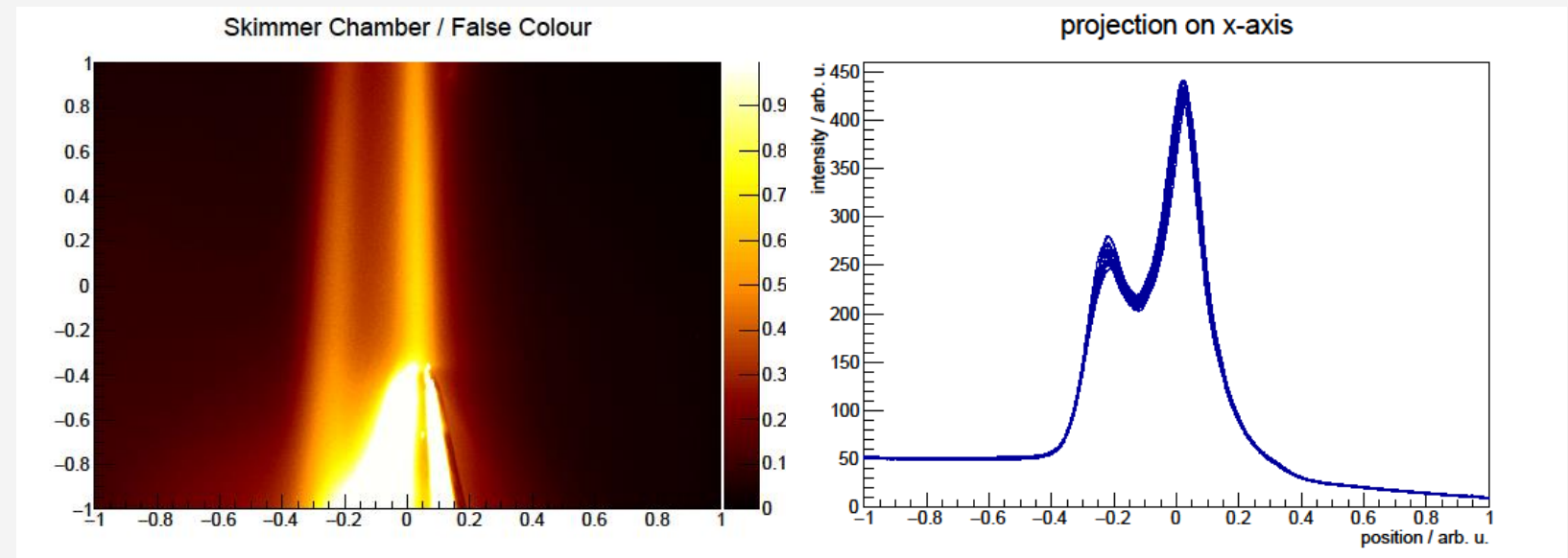
# Status of the Cluster-Jet Target Gas System

- Status at last meeting was:
  - No stable cluster jet beam with liquid hydrogen in front of the nozzle
  - Recurring nozzle clogging
  - Broken Baratron due to metallic particles inside the gas system



# Status of the Cluster-Jet Target Gas System

- Status now:
  - Spare hydrogen purifier
    - max. pressure 17 bar
    - no highest thicknesses until now ( $7 \times 10^{14}$  atoms/cm<sup>2</sup>)
  - Stable cluster beam
- But still some nozzle clogging problems



# Status of the Cluster-Jet Target Gas System

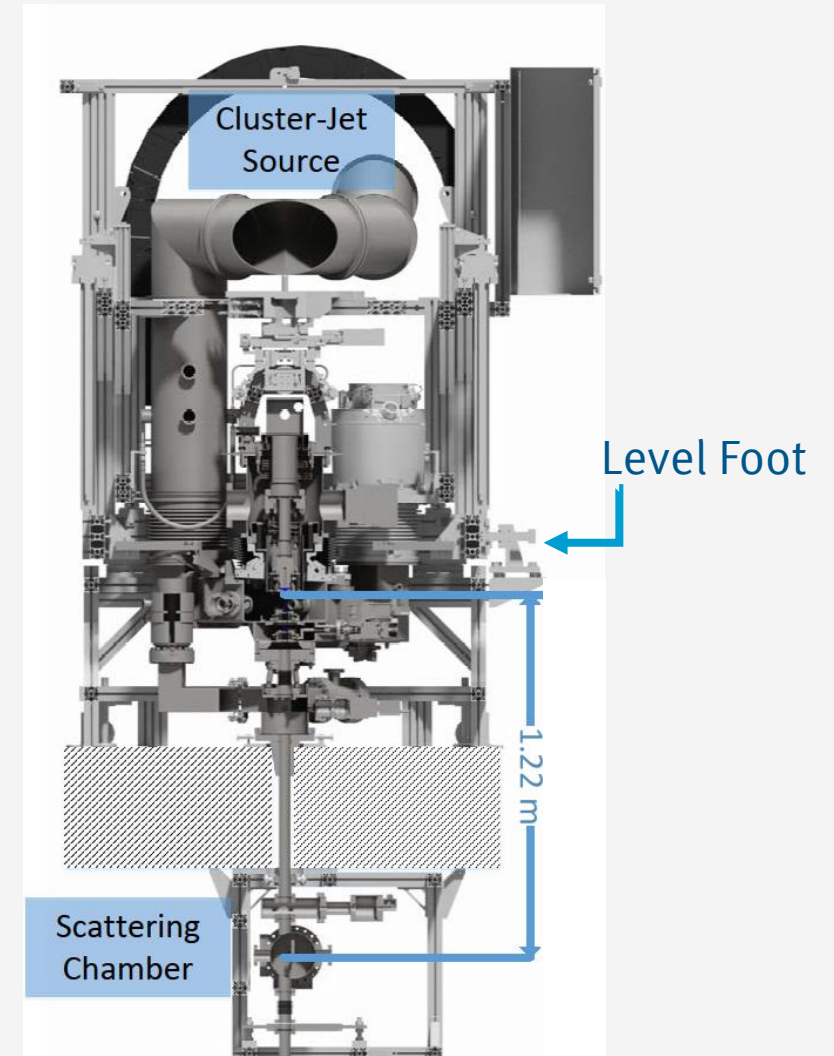
- Investigations on nozzle clogging problems:
  - Intrinsic nozzle problem?
    - Multiple alternative nozzles available which already showed similar thickness distributions
  - Impurities from broken purifier?
    - Exchange of whole gas supply system might be required
- Both options in preparation

# Beam and Beam Line Adjustments

- Pressure in collimator chamber a decade too high
  - Skimmer-Collimator adjustment needed
  - Check of effective pumping speed at collimator chamber
- Beamline adjustment needed
  - Monitor systems show not perfectly aligned beam
  - Necessary for significant information about vacuum condition

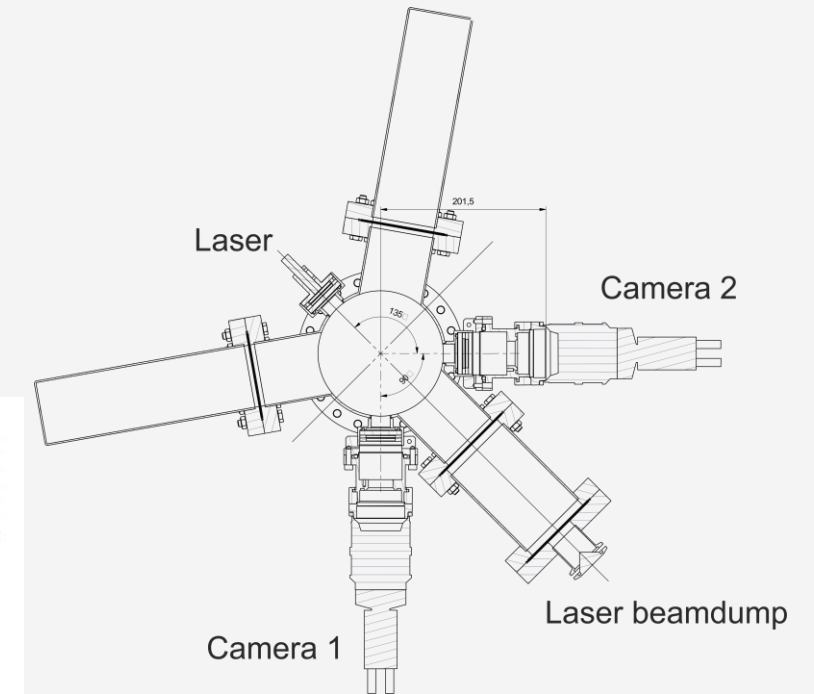
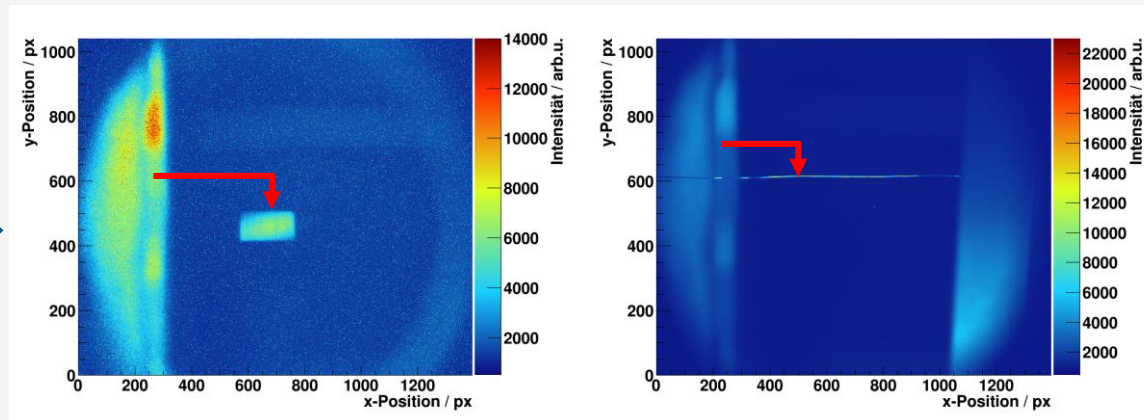
# Beam and Beam Line Adjustments

- Beamline adjustments done by 4 level feet
  - ✓ Coarse adjustments done
  - ❖ Second fine adjustments done, but:
    - ❖ Support frame to soft
    - ❖ Cluster-jet source currently misaligned



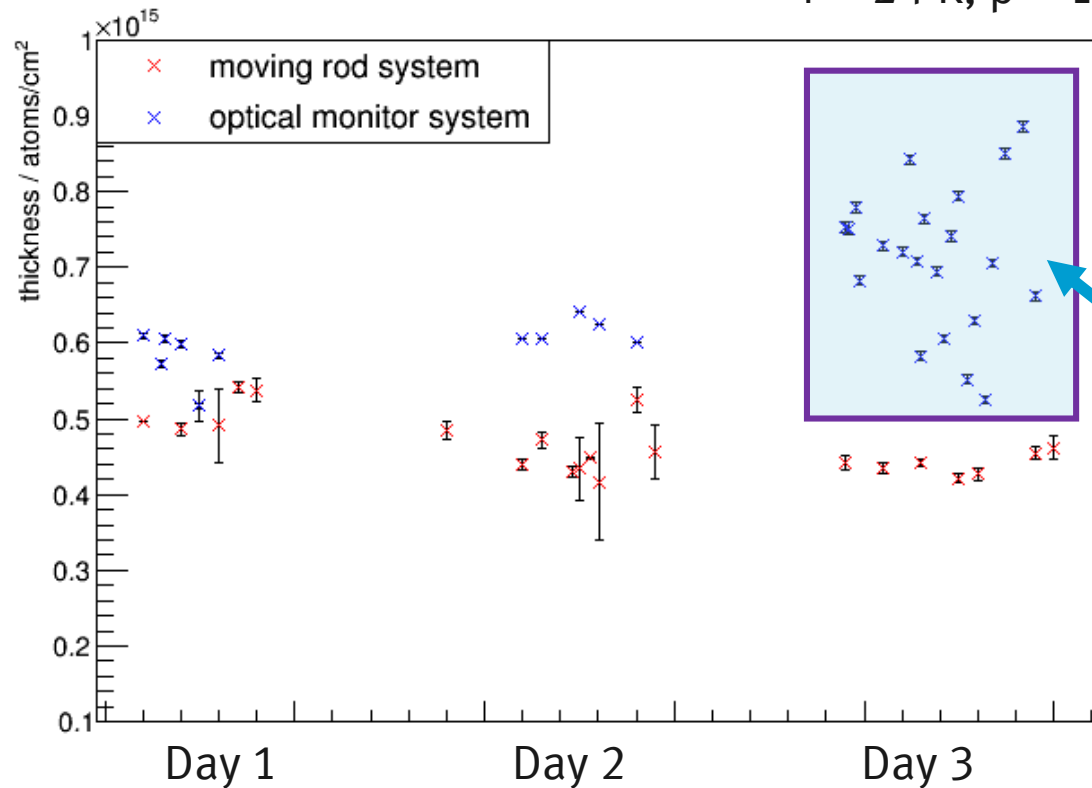
# Investigations using the Optical Monitor System (OMS)

- OMS set into operation by a former bachelor student
- Located at Transition Vacuum Chamber
- New bachelor student investigates relation between relative OMS information and absolute thickness information by moving rod system



# Investigations using the Optical Monitor System (OMS)

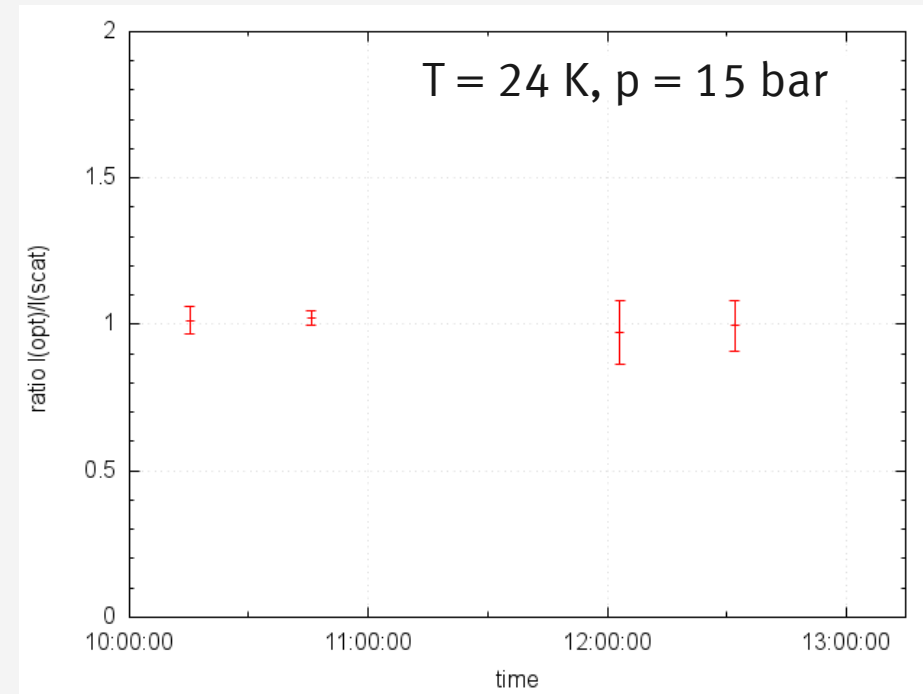
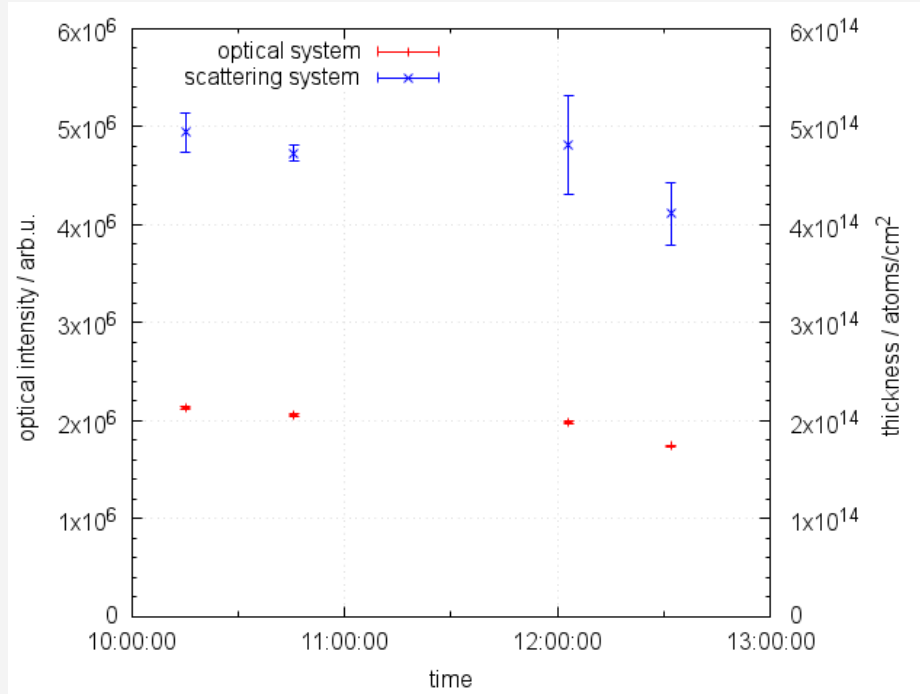
$T = 24 \text{ K}, p = 15 \text{ bar}$



- Stable beam conditions (moving rod system)
- OMS data scaled to be comparable
- Day 3 distribution of OMS scatters due to tests of optimal exposure time and other camera settings



# Investigations using the Optical Monitor System (OMS)



✓ First calibration results are promising

## PANDA target @ COSY

- Due to mentioned problems with the gas system:
  - Minor delay in calibration and optimization studies at Münster
  - Installation at COSY probably shifted to end of autumn/winter 2017
  - First beam time slot in 2018

## Next Steps

- Solve nozzle clogging and gas system problems
  - ✓ Approches shown
- Investigate and optimize vacuum conditions
- Investigations of target thickness monitoring using the optical monitor system
  - Signal intensity behaviour by different target stagnation conditions
  - Matching with absolute thicknesses by moving rod system

