

# Integration of the Pumping Station and first Operation of the Cluster-Jet Target

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PANDA Collaboration Meeting, March 1st 2016



# PANDA Cluster-Jet Target

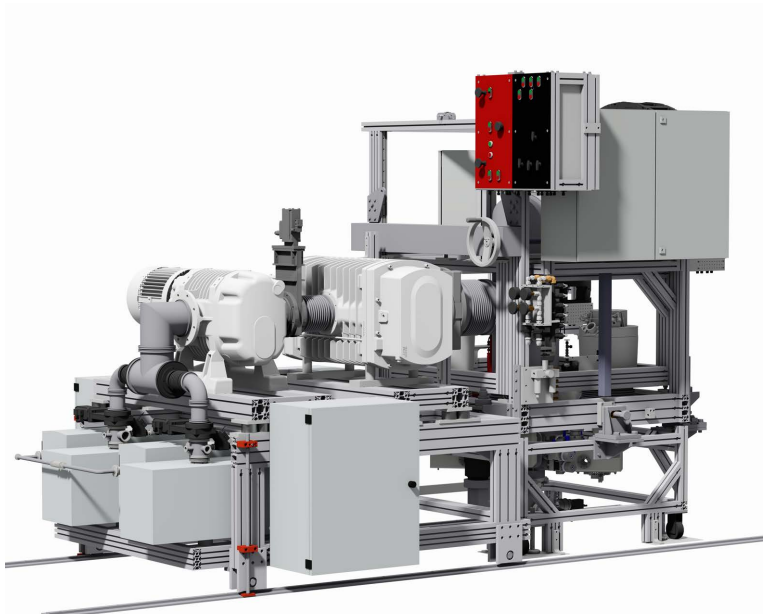
Last status



- Gas pipes installed
- Hydrogen cleaner installed and ready for operation
- Elektronik rack implemented
- Elektronical installation almost finished
- Automatic lifting system set into operation
- Observation of cooling water parameters integrated
- Control of cross-tables (skimmer/collimator) implemented

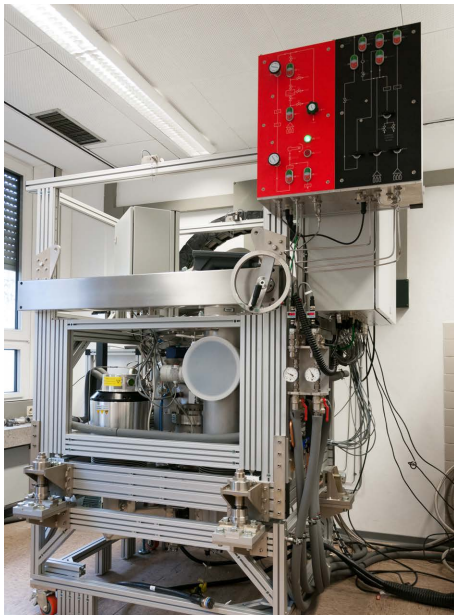
# PANDA Cluster-Jet Target

## Integration of final pumping station



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Integration of final pumping station



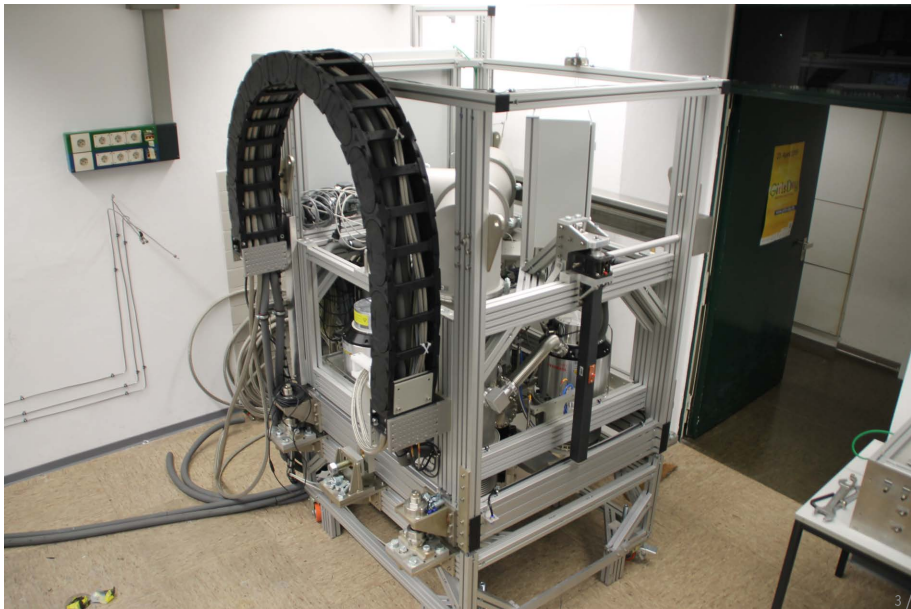
# $\bar{P}$ ANDA Cluster-Jet Target

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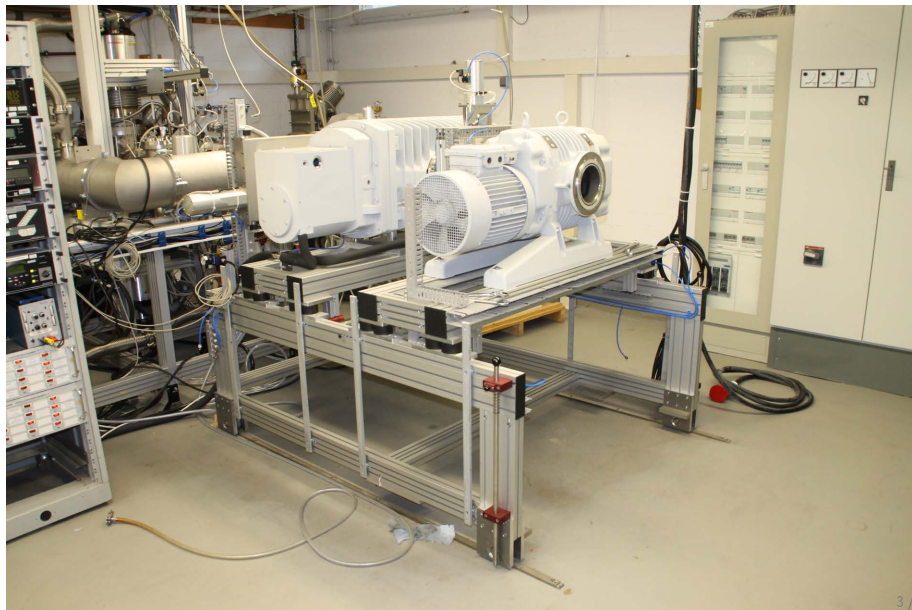
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Integration of final pumping station



# $\bar{P}$ ANDA Cluster-Jet Target

## Installation of scattering chamber and provisoric beam dump

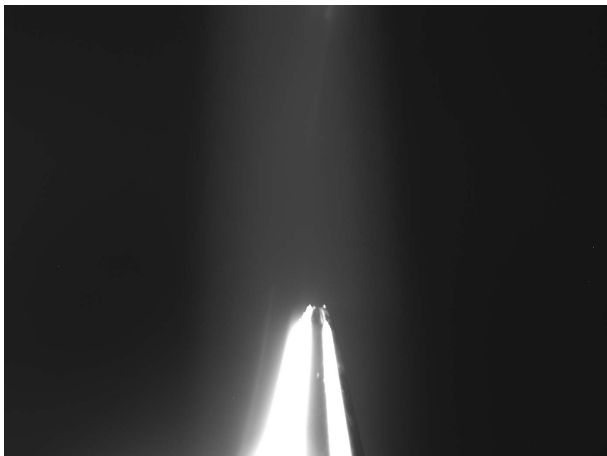
- Scattering chamber installed at ceiling of cellar lab
- Provisoric beam dump consists of one turbo pump



# PANDA Cluster-Jet Target

First cluster beam

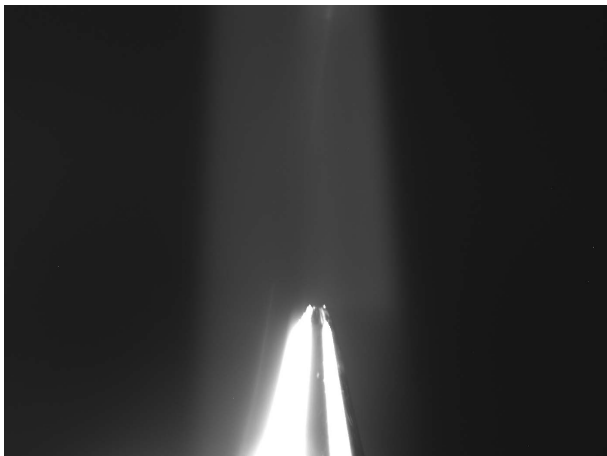
- 25 K, 7 bar



# PANDA Cluster-Jet Target

First cluster beam

- 25 K, 9 bar

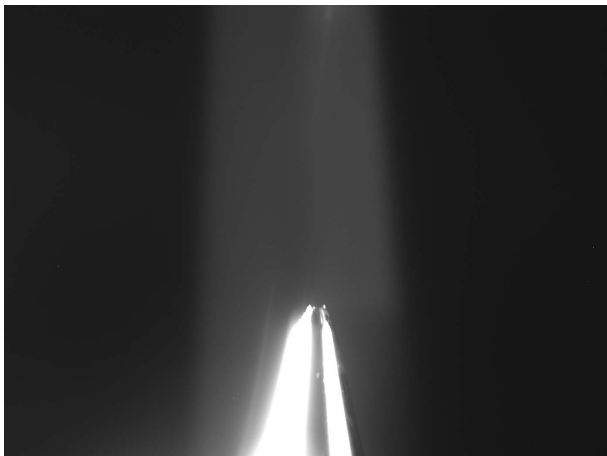




# PANDA Cluster-Jet Target

First cluster beam

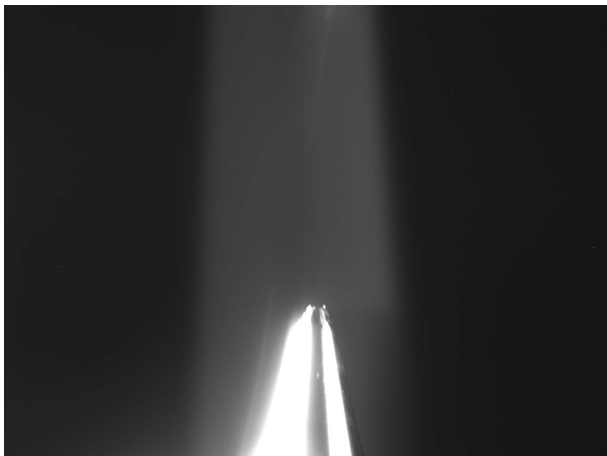
- 25 K, 10 bar



# PANDA Cluster-Jet Target

First cluster beam

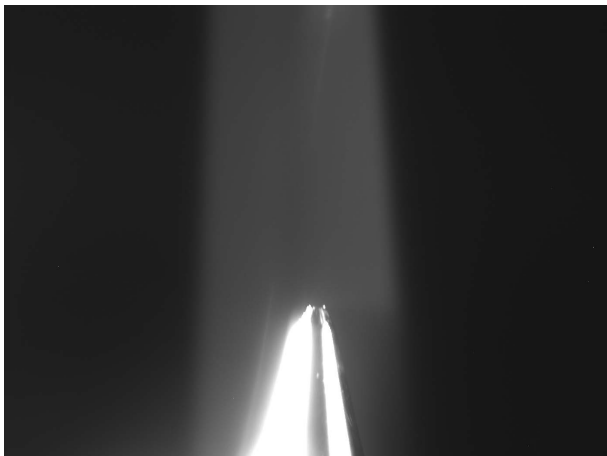
- 25 K, 12 bar



# PANDA Cluster-Jet Target

First cluster beam

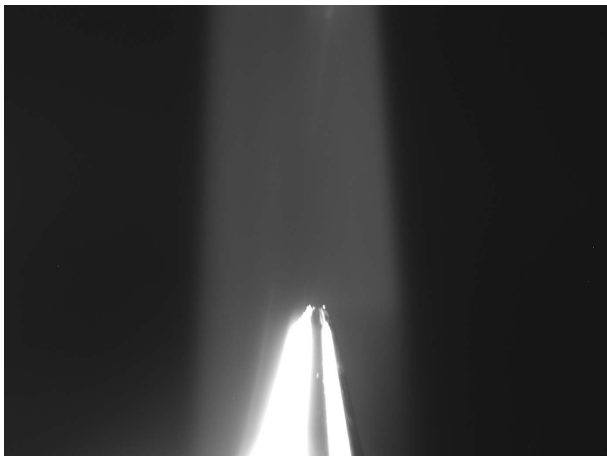
- 25 K, 14 bar



# PANDA Cluster-Jet Target

First cluster beam

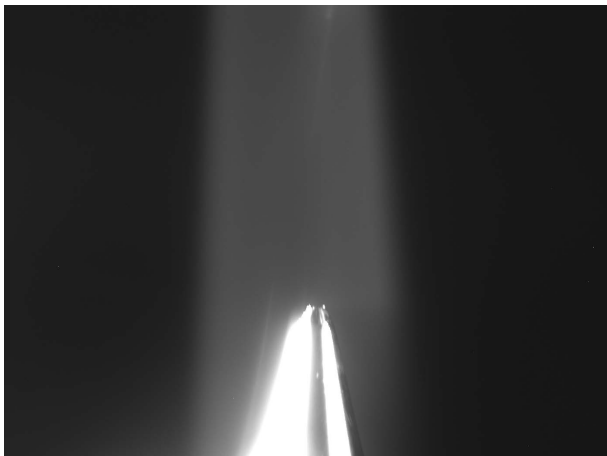
- 25 K, 16 bar



# PANDA Cluster-Jet Target

First cluster beam

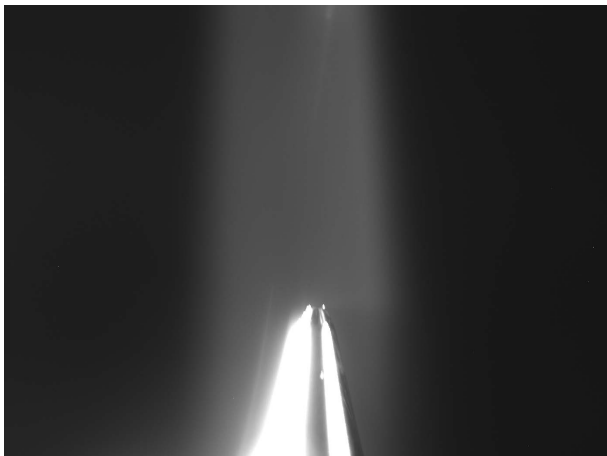
- 24 K, 16 bar



# PANDA Cluster-Jet Target

First cluster beam

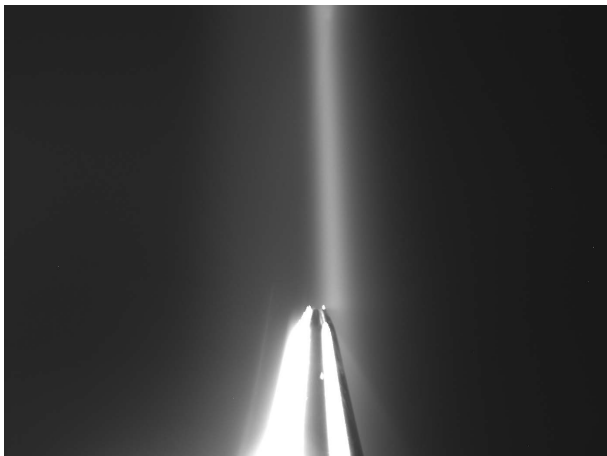
- 22 K, 16 bar



# PANDA Cluster-Jet Target

First cluster beam

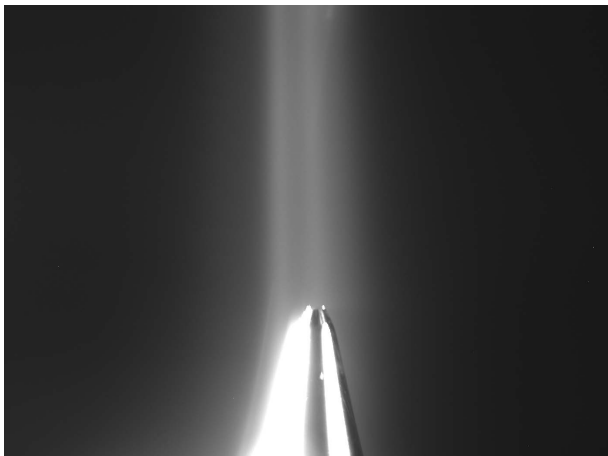
- 22 K, 17 bar



# PANDA Cluster-Jet Target

First cluster beam

- 21 K, 17 bar

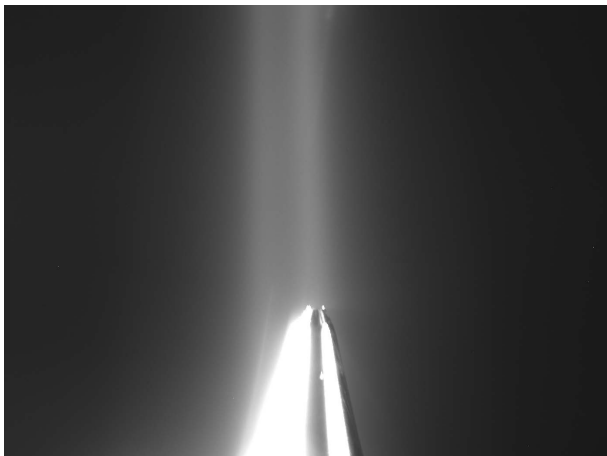




# PANDA Cluster-Jet Target

First cluster beam

- 20 K, 17 bar



# PANDA Cluster-Jet Target

## Next steps

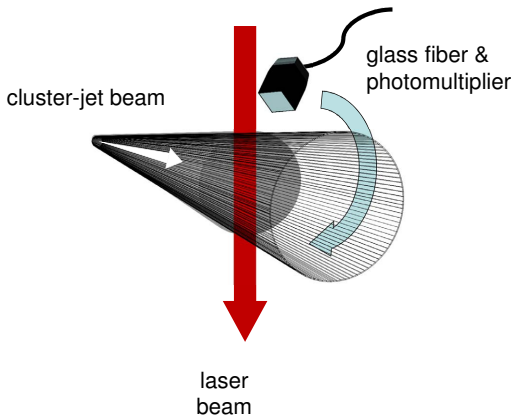


- Extensive tests of cluster source
- Find settings of skimmer, collimator and spherical joint to get highest thicknesses
- Scan of cluster beam via spherical joint (B. Hetz)
- Integration of final beam dump
- Development of a monitor system in the transition vacuum chamber based on optical observation of the cluster beam
- Integration of monitor system in the scattering chamber

# Determination of the Cluster Size Distributions

via Mie scattering

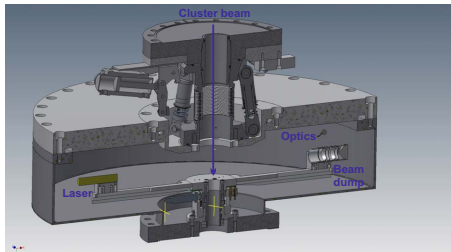
- Mie measurements were done at University of Frankfurt (Group R. Grisenti)
  - First measurements at the MCT1S with Frankfurt setup
- ⇒ Spectrum measurably
- ⇒ Too many reflections
- ⇒ Problems with glass fiber/  
Too small chamber



# Determination of the Cluster Size Distributions

via Mie scattering → Requirements of new Setup

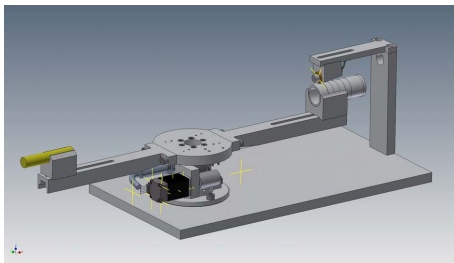
- Minimizing of reflections
- Enlarge distance between cluster beam and laser/optics
- Moveable laser, fixed glass fiber
- Detector with low dark current → Laser Components Module COUNT10
- Installation at  $\bar{P}$ ANDA target  
→ Transition Vacuum Chamber
- Chamber  $\varnothing$  500 mm
- Angle between optics and rotational axis  $7^\circ$



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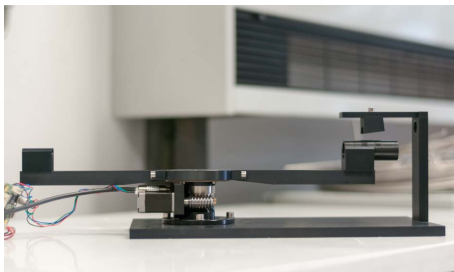
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# Determination of the Cluster Size Distributions

via Mie scattering → Next Steps

- Extensive tests ongoing
- Reduction of reflections
- Design of new chamber
- Tests in new chamber:
  - Reflections?
  - Vacuum conditions...

