

Update on the PANDA cluster-jet beam dump

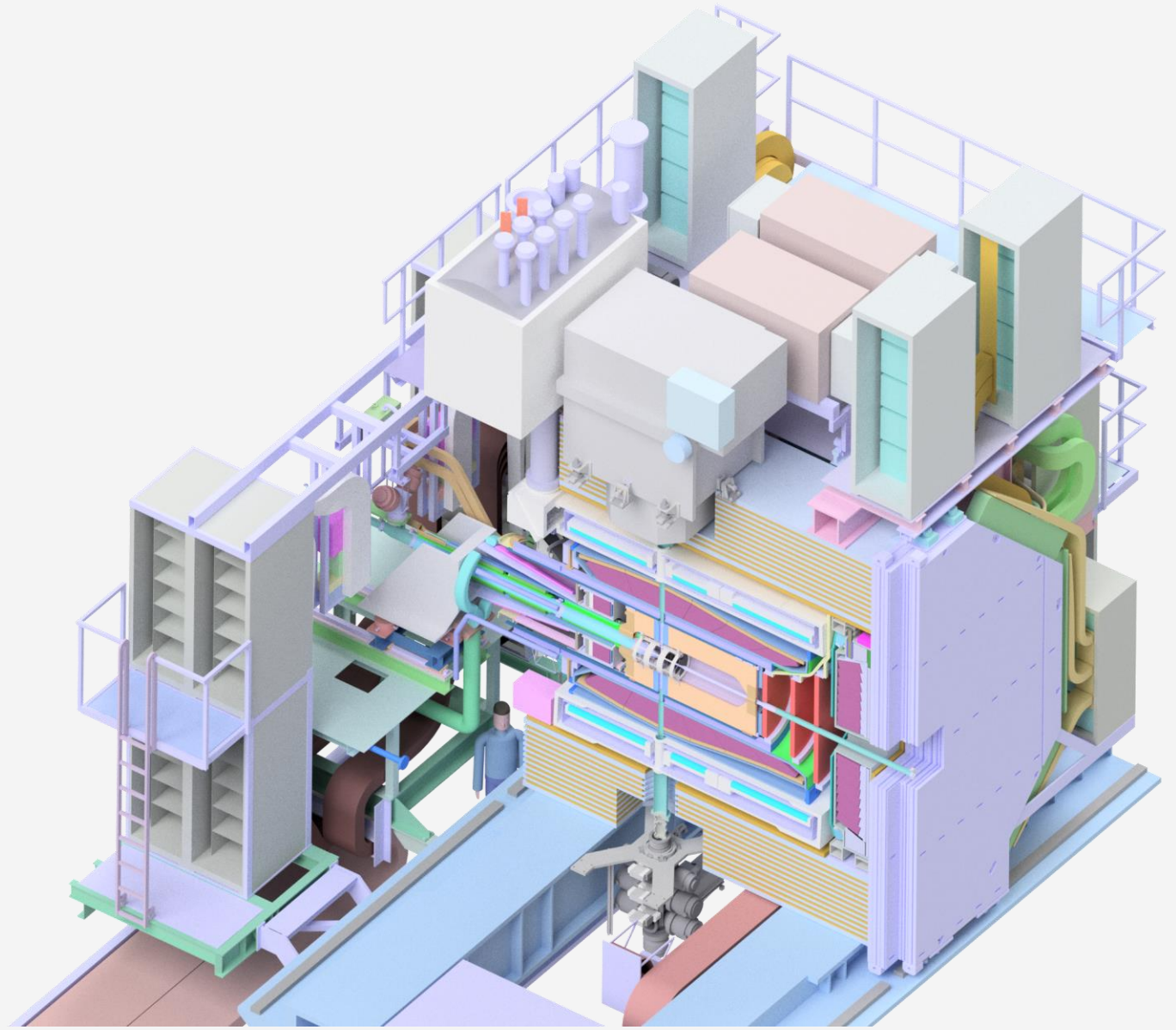
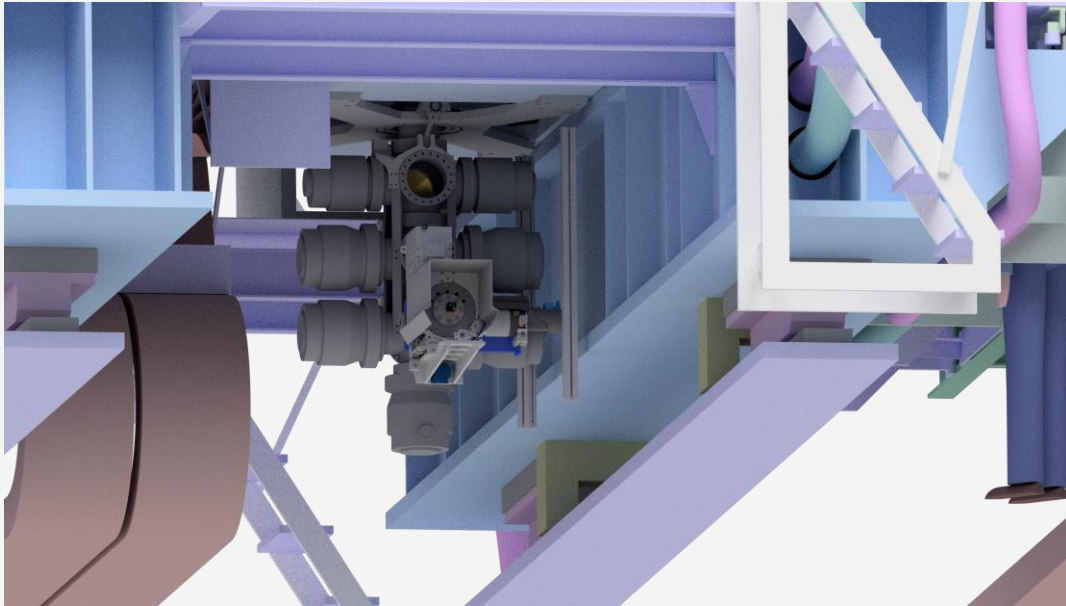
Philipp Brand

WWU Münster, Institut für Kernphysik, Germany

PANDA collaboration meeting, October 10 – 14, 2022

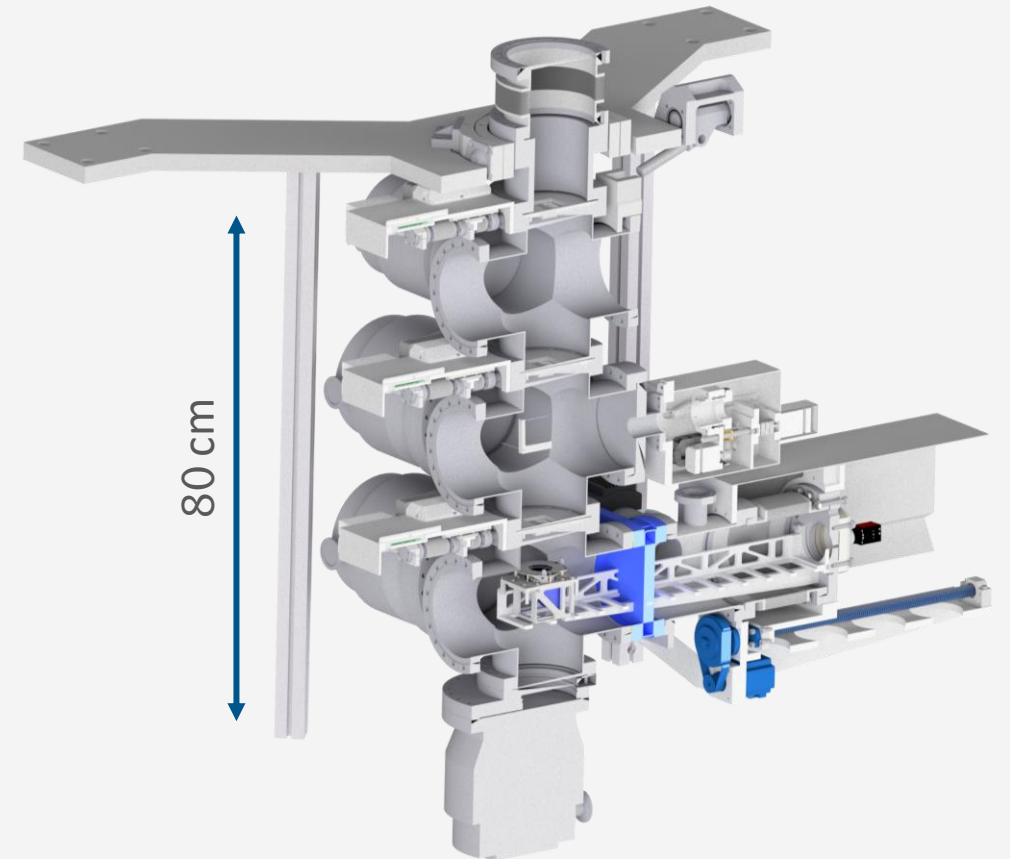


Modified target beam dump



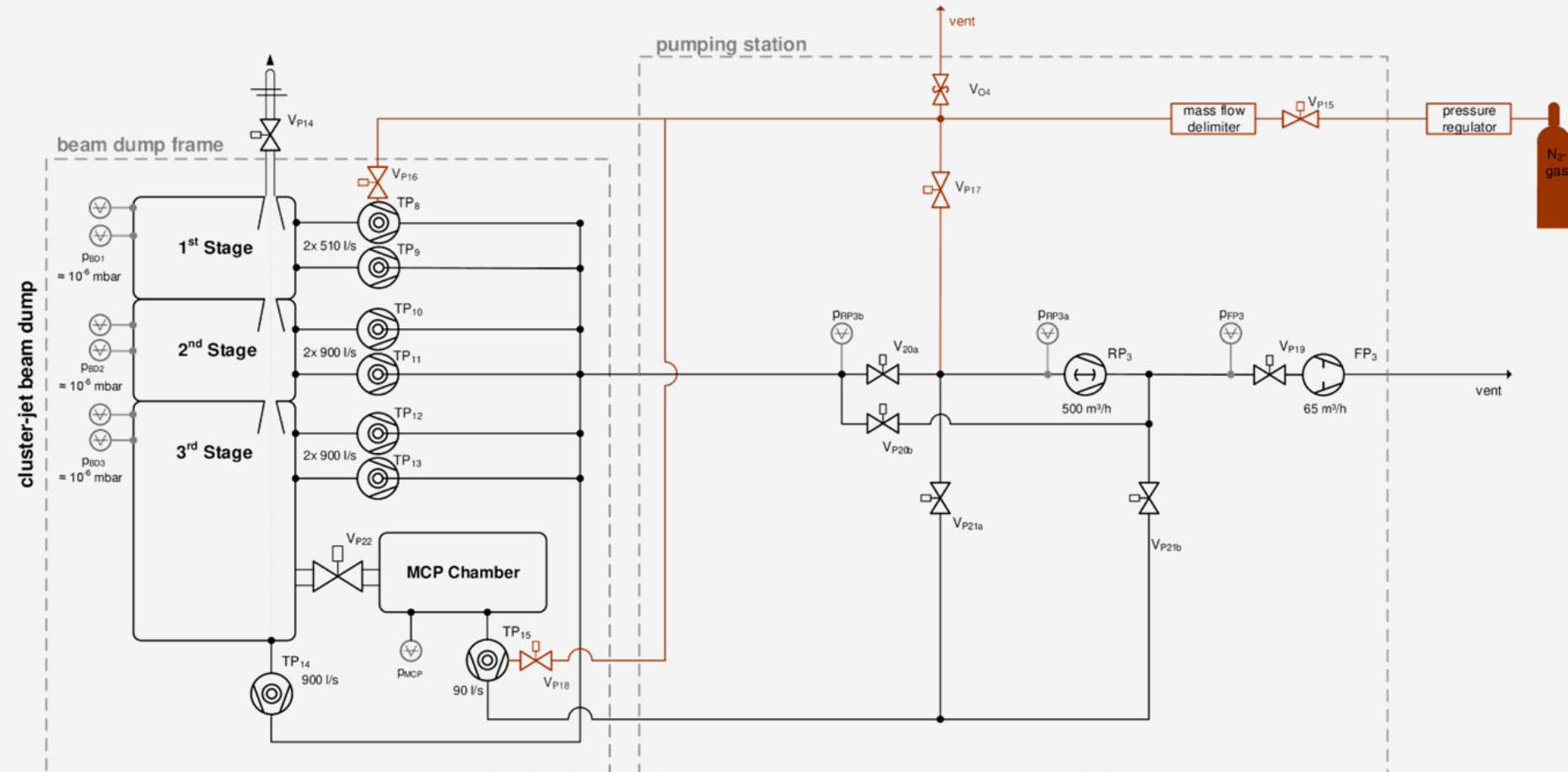
Modified target beam dump

- Three stages equipped with monitoring systems:
 - Absolute thickness monitor system (AMS)
 - MCP on a movable arm
- Adjustable orifices between the stages



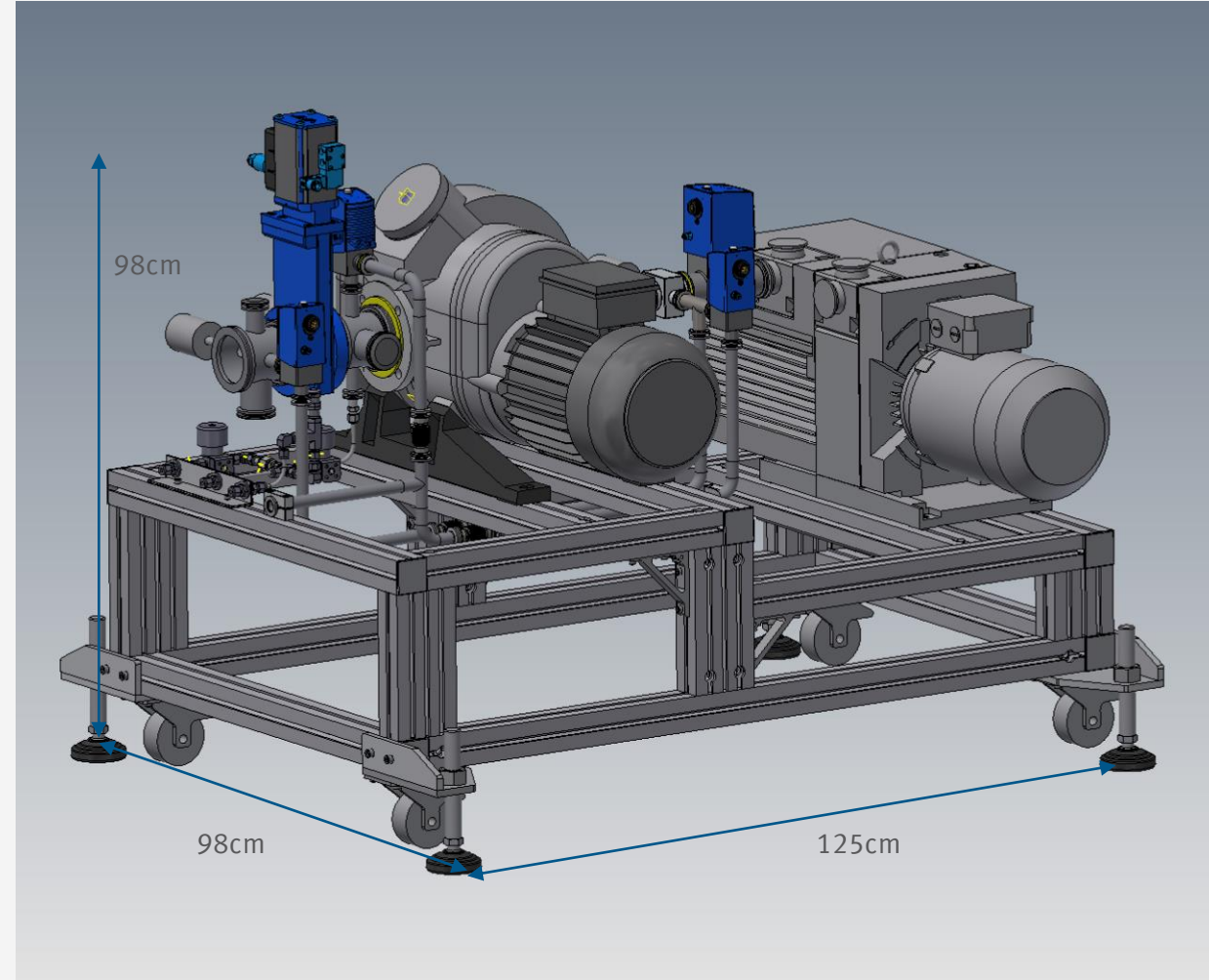
Pumping system

- Design of the beam dump pumping system finished
- Located directly at the beam dump below the solenoid



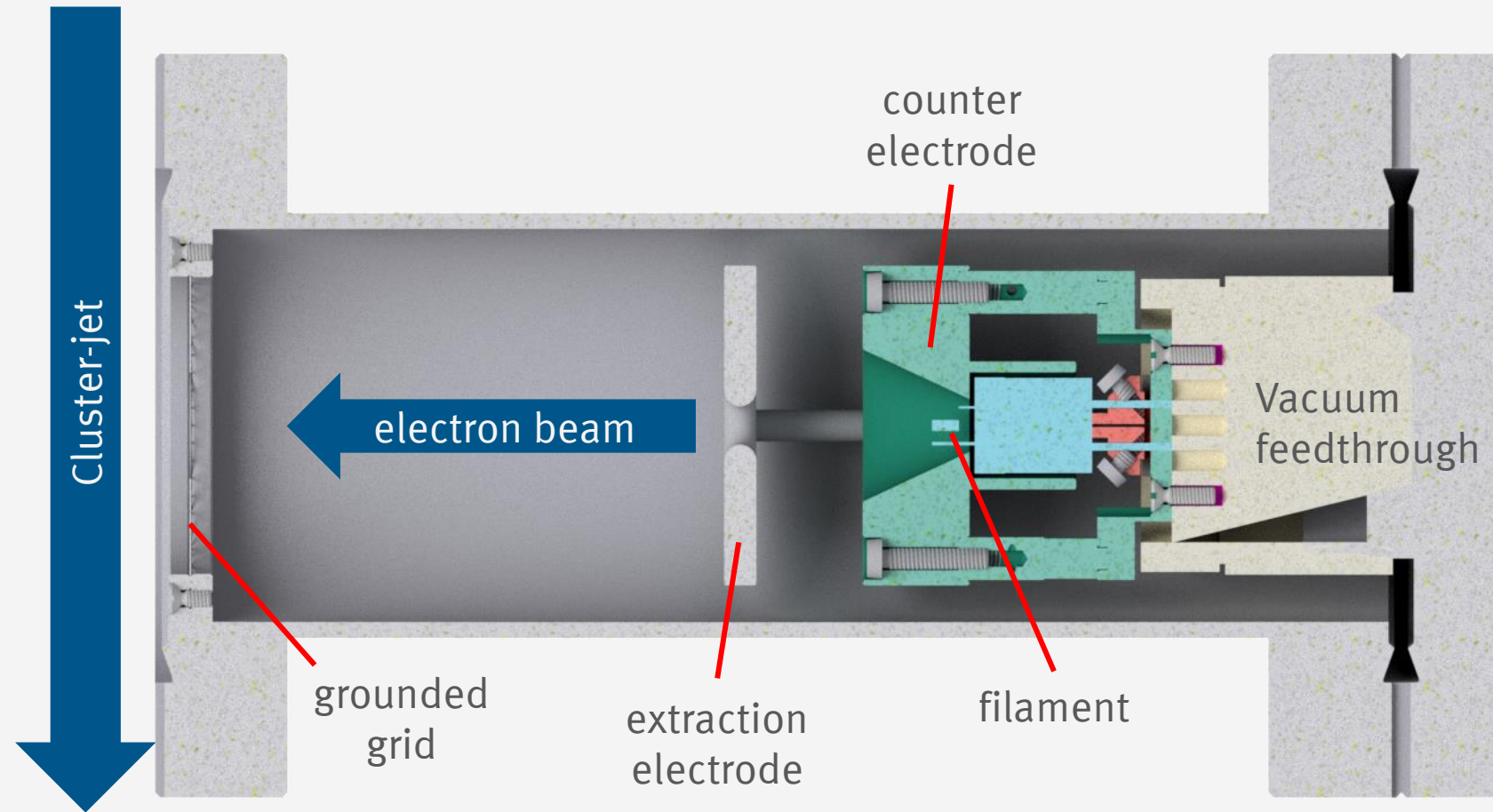
Design of new Pumping Station

- Rotary vane pump and roots pump
 - Remote controllable (pumps, pneumatic valves, gate valves)
 - Movable for easy access in maintenance
 - Placed under detector directly next to beam dump
 - Separate ventilation line with clean gas
- CAD drawing finalized
- Parts will be ordered and manufactured soon

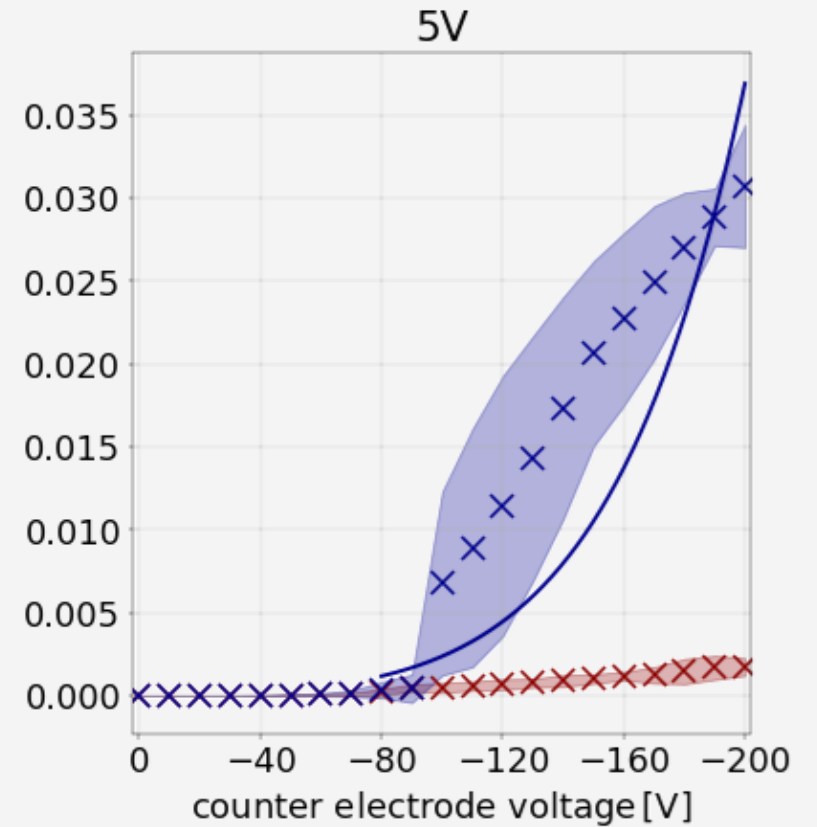
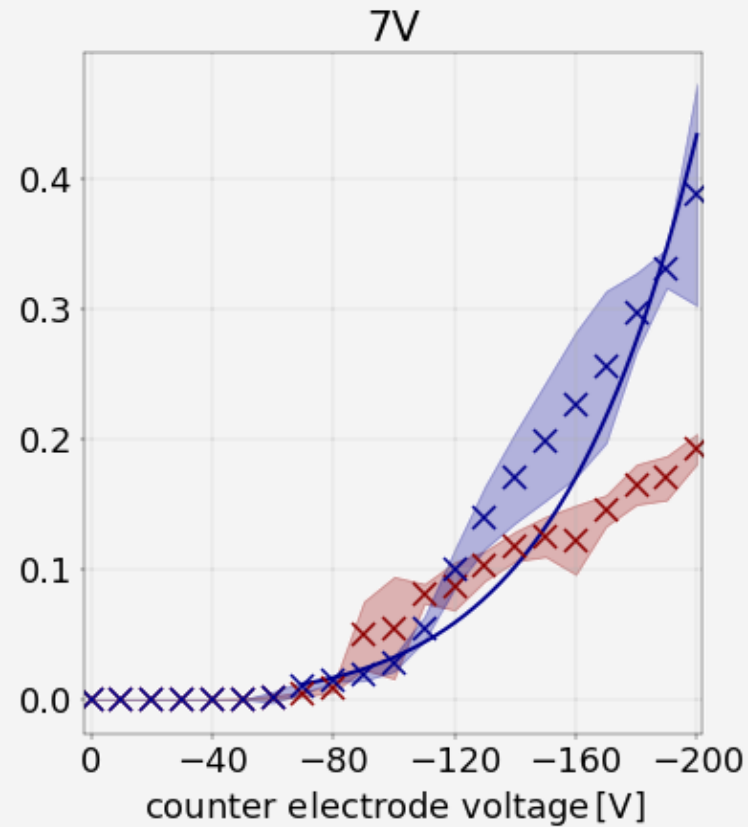
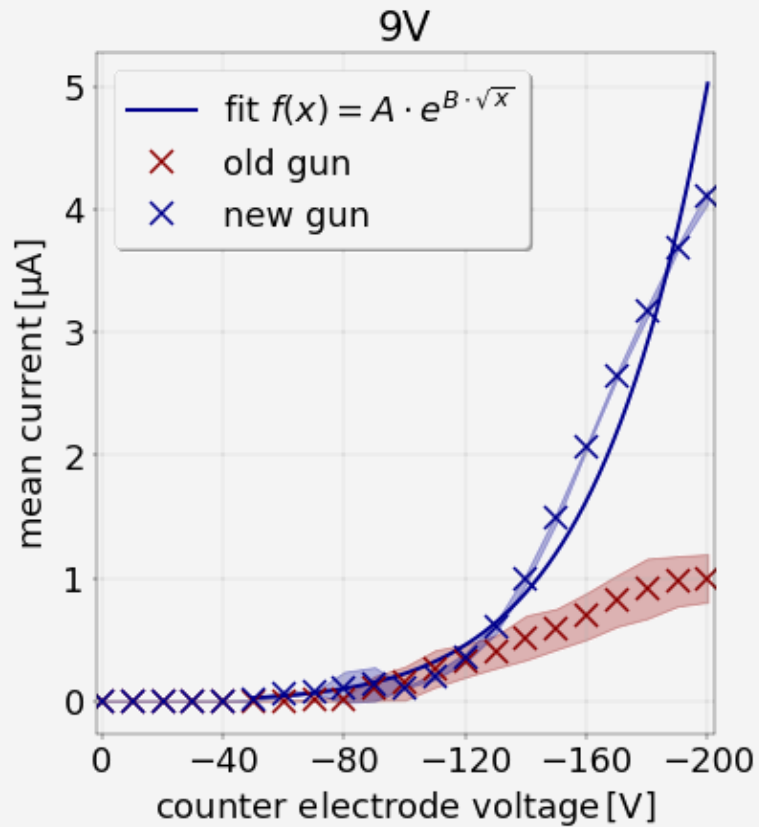


A new electron gun

- Electrons leave a filament (12V 10W)
- Acceleration with counter electrode (-150 V)
- Extraction electrode can be used to stop electrons (-170 V) for pulsed operation
- Modular design

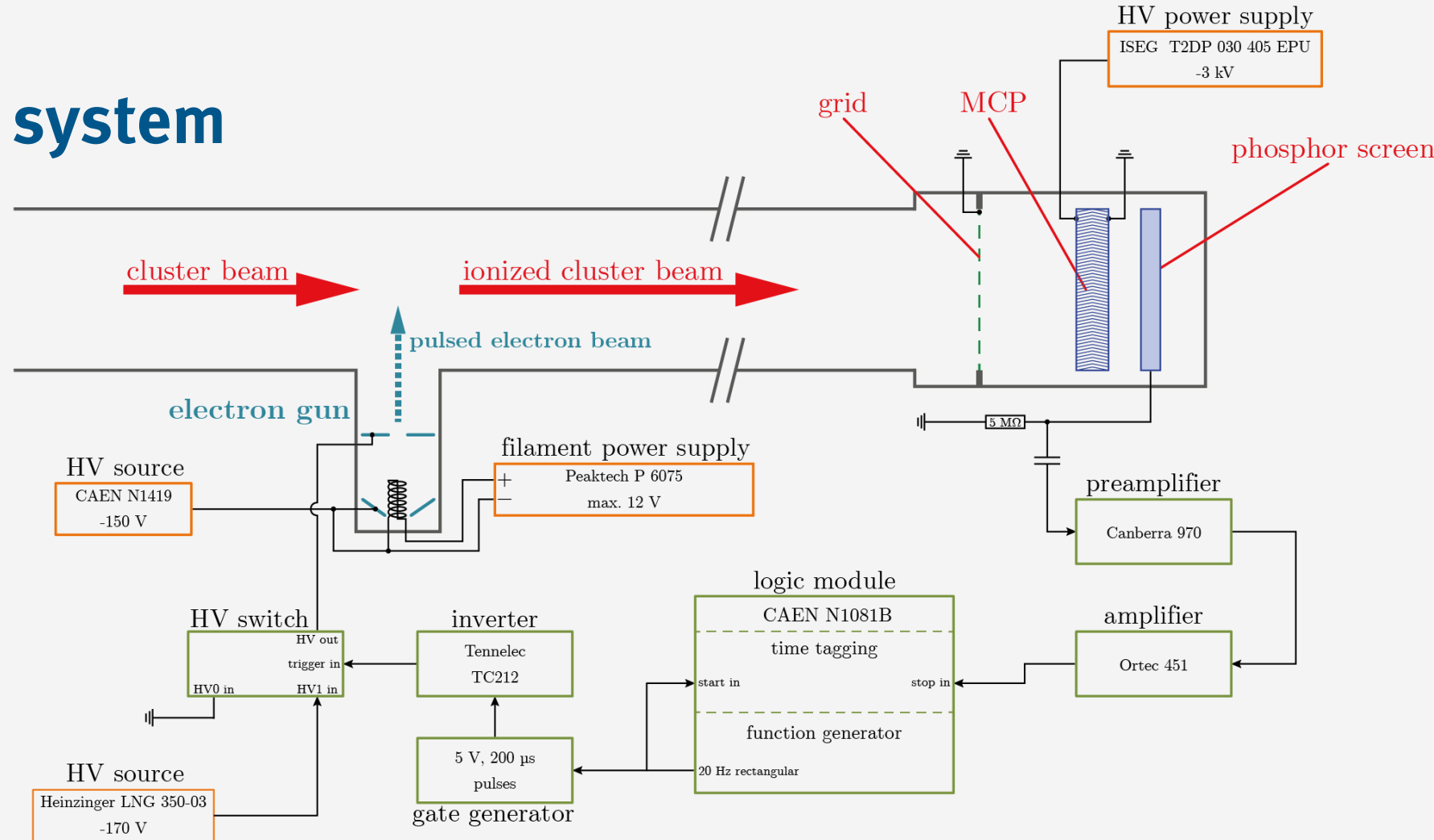


A new electron gun



New Time-of-Flight system

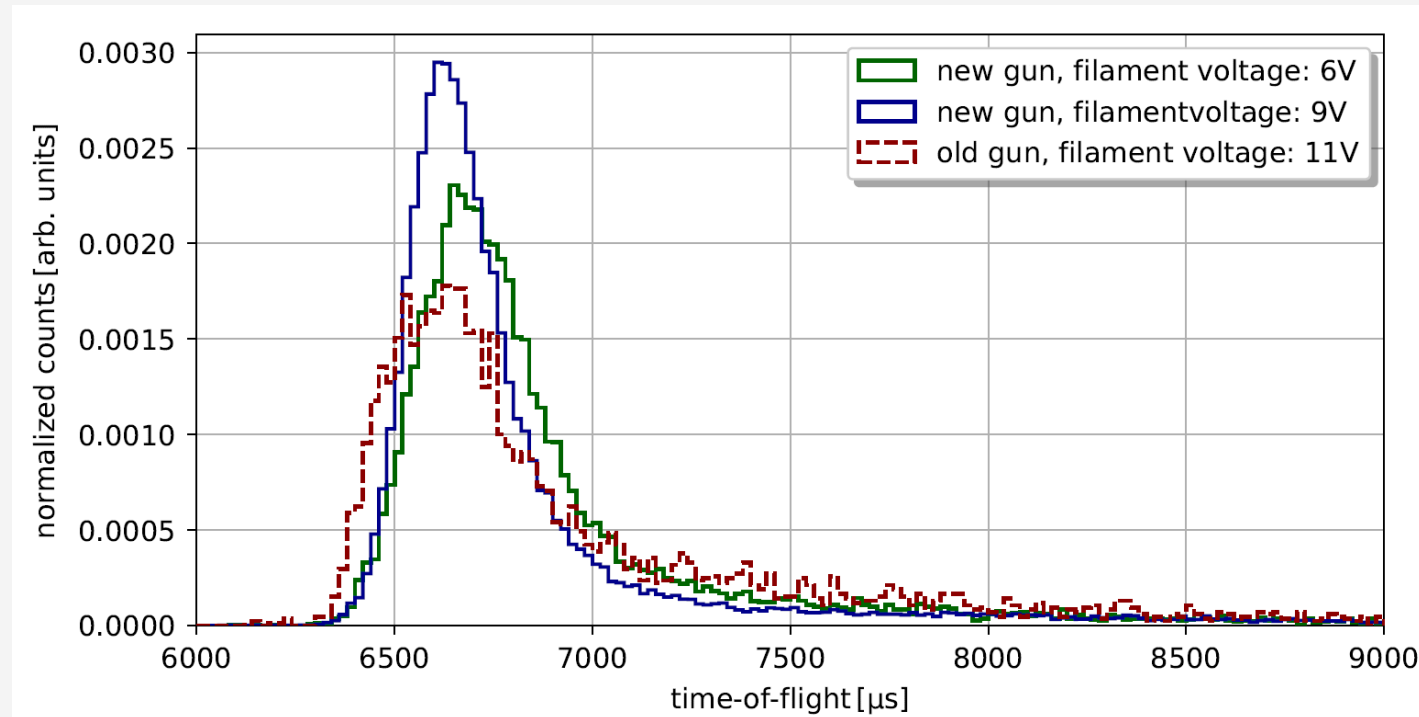
- Pulsed e-gun operation
- Logic module as function generator and for ToF measurement



New Time-of-Flight system

- New ToF system is operational
- Much higher rates possible

	Duration	Rate	Gate length
new gun 6V	100 min	2,68 Hz	200 μ s
new gun 9V	8 min	92,42 Hz	200 μ s
old gun 11V	99 min	0,85 Hz	20 μ s



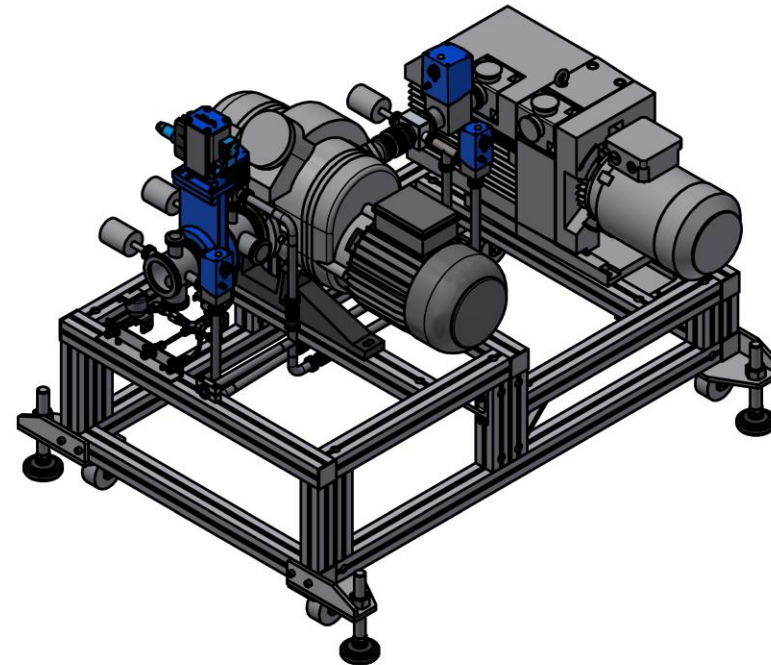
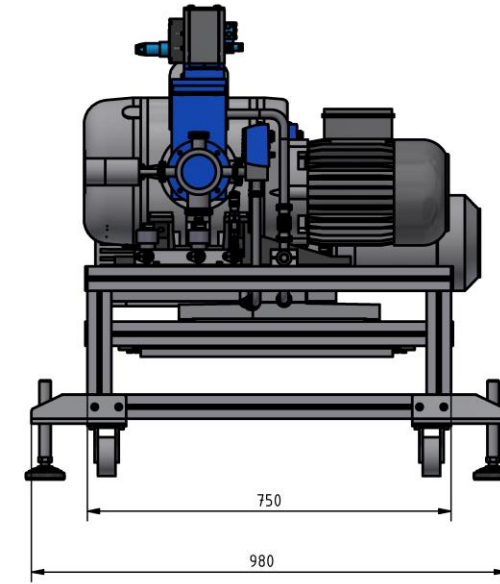
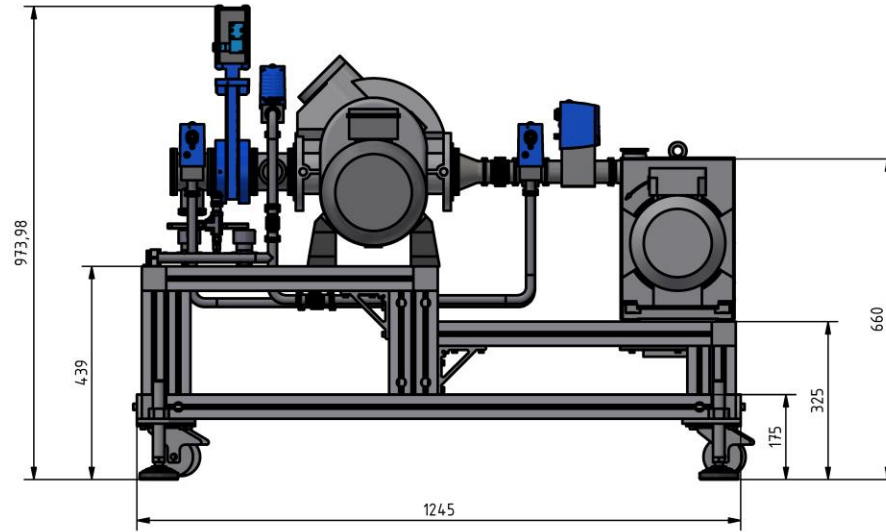
Summary


- Design of modified beam dump and pumping station finished
 - Complete beam dump will be tested with the PANDA target at COSY
- New electron gun for cluster-jet monitoring was set in operation
 - Performance fulfills all demands, better performance than old gun at prototype target
 - First operation in pulsed mode with new ToF system was successful, much higher rates will be possible, significant decrease of measuring time for ToF spectra

Thank you for your attention!



Backup



Oberfläche:
Allgemeintoleranzen ISO 2768-fH-E
Projektion ISO 5456-2: 

Arbeitsgruppe/Projekt Khoukaz-MCT_PANDA	Erstellt durch Rummler	Werkstoff	Menge 1	Maßstab 1 : 10
 Institut für Kernphysik Wilhelm-Klemm-Str. 9 48149 Münster	Dokumentenart Baugruppe	Kostenelement 31200584.00		
	Bauteilnummer, Titel 02PAN20398 Pumpstand_Detektor	Zeichnungsnummer 02PAN20398-Pumpstand_Detektor		
	Änd. V218	Ausgabedatum 13.09.2022	Spr. de	Blatt 1