



## Project planning and status (May 2018)

**Ongoing:** Multi-camera r/o, control, monitoring and analysis developments.

Preparation of a “generator” tracking chamber that can house four measurement levels.

All hardware details for the chamber are ready for assembly in June.

**Time line:** Tests of a measurement level module (DM) prototype were done 2016.

Tests of the “generator” tracking section start in autumn 2018 ...

Design of the “dump” tracking section. It depends on mechanical design of the target dump area and on experience from cluster-jet tests at COSY.

To be able to prepare the complete system with two tracking sections, additional funding is needed. Then it may take only a few years if some of our expert personnel (and infrastructure) is still available.

**Risks:** Evaluation done (Autumn 2013 (TDR), Feb 2015 (SG) ).

**Funding:** Consumables and running: Almost zero ...

**HPH2020 application will be submitted 2018 .... (?)**

**Equipment: CTS grant (20k€) 2017-18. New application was submitted.**



## Tests of “Pellet Tracking” with PANDA **Cluster-jet** at COSY

The PTR system will provide jet (x,y) position, shape and detailed variations on different time scales, possibly down to 20 microsec.

Some differences between cluster-jet and pellet-stream that the system has been adapted for:

- 1) size at accelerator pipe about 13 mm compared to 3 mm
- 2) time structure continuous on the scale of microseconds
- 3) optical properties i.e. light reflection and transmission

Also to some extent how to treat the camera image information.

**The present UPTS tracking chamber with two measurement levels will be used together with ...**  
**... two DMs each equipped with one LS-camera and one STR-laser at 90 degrees, both with modified optics to cover the jet completely.**



**Time plan: Spring - Summer 2018**

**Summer service period w25**

**Autumn 2018 ...**

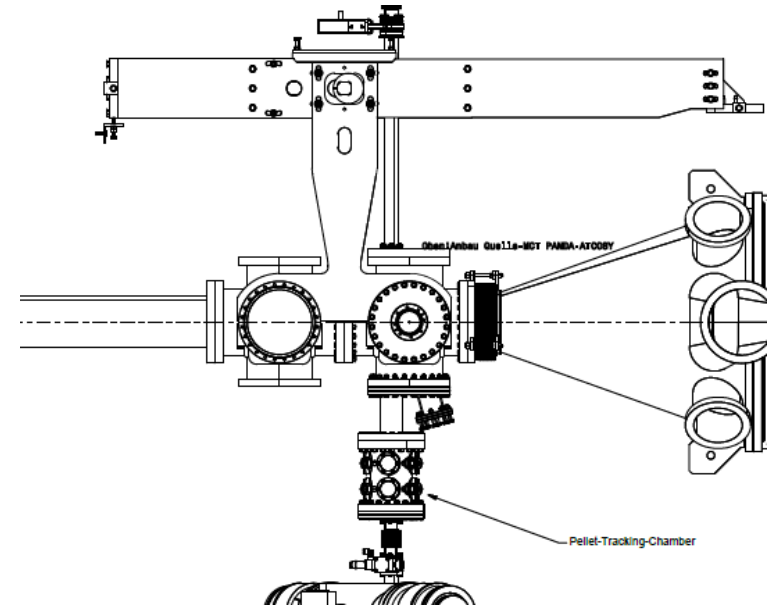
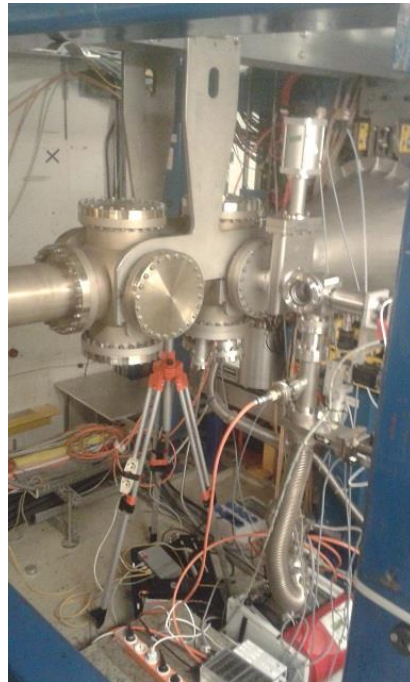
- assemble and prepare the setup in Uppsala. All h-w details are ready.
- install the PTR chamber at COSY.
- install the DMs and carry out tests.



**Installation of the Pellet tracking system at the COSY beam region, in steps:**

- PTR chamber and maybe cabling\* together with installation of the dump.
- Two DMs with cameras and lasers just before a test with the cluster-jet.

**The cluster-jet test vacuum chambers at COSY. Photo of the installed scattering chamber, April 2017. The PTR chamber will sit just below the COSY beam.**



PTR status  
Panda CM  
Stockholm  
June 2018

**PTR chamber sent  
from Uppsala 24/5.**

Size = 30x30x30 cm  
Total weight = 22 kg



**The PTR DM plates will stick out from the chamber 310-340 mm in different directions.**

**Some space for mounting is also needed around the chamber.**

**Maybe need for some radiation shielding of the LS-cameras.**



## Preparation and installation of the Pellet tracking system at COSY .

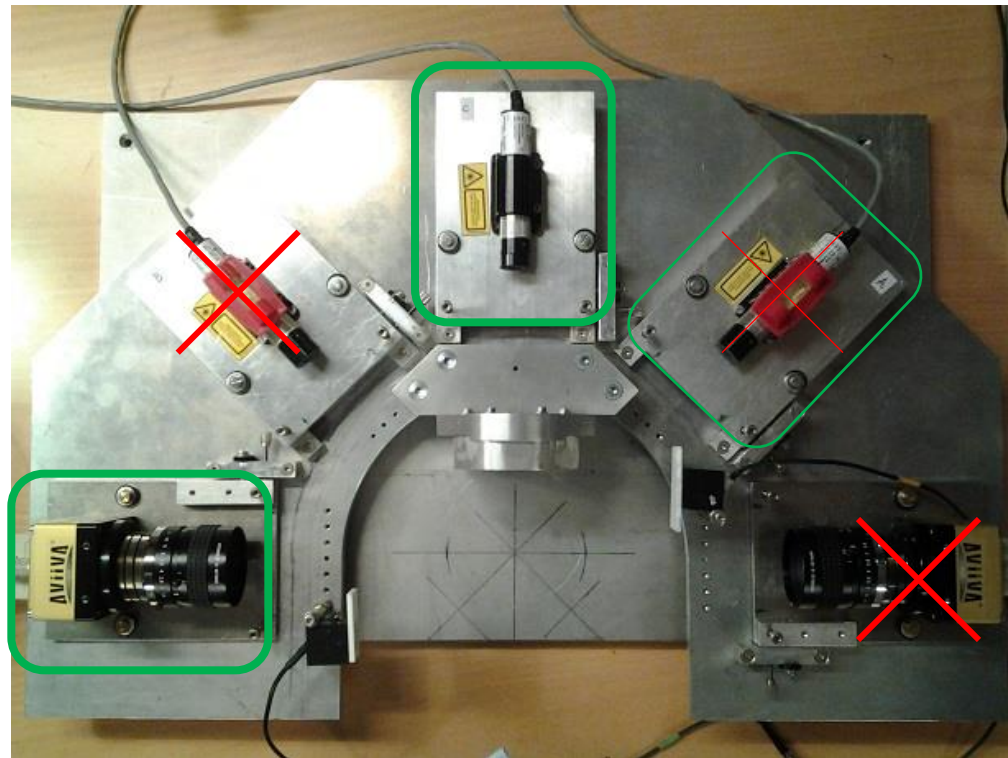
The DMs should be pre-aligned in a desktop setup and installed just before the test. Its alignment should then be checked and fine tuned with the cluster-jet after the installation.

The photo shows a DM with two cameras and three lasers in a desktop setup for alignment of the cameras and lasers.

From left to right camera A, lasers B, C, A and camera B.

The alignment target is normally placed at the cross in the center.

**For the cluster-jet setup, 1 camera and 1-2 lasers will be used.**

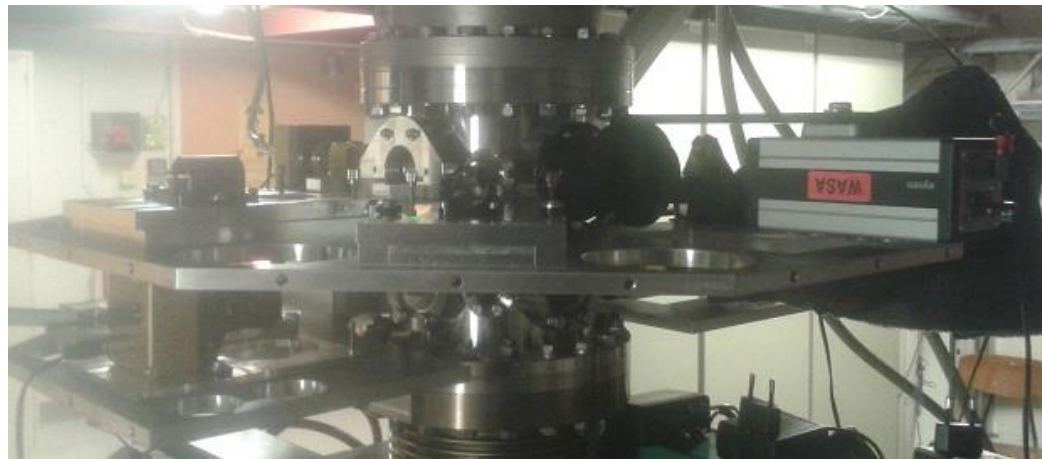






**"Uppsala CCD camera monitoring systems" A and B.**

**System-A with DMs mounted on the PTR chamber. In this case also a std CCD camera can be mounted opposite to the LS-camera (photo from UPTS).**



**System-B is w/o the LS-camera DMs. SNF-lasers and std CCD cameras are mounted in separate holders as it was on the WaC pellet pipe (left photo). A monitor image of 2.5 mm wide pellet stream in PTR chamber at UPTS (right photo).**

