

Status of the pellet target for the WASA@COSY experiment

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In June 2005 the transfer of the WASA-detector from CELSIUS to COSY has been started and will be finished with the commissioning of WASA at COSY in the second half of 2006 [1]. An essential part of the WASA-experiment is the internal pellet target, which is the first and up to now only pellet target system which was operated as an internal target in an accelerator experiment [2, 3].

A scheme of the target generator where the pellets are produced is depicted in figure 1. Liquid hydrogen is pressed through a vibrating glass nozzle. The vibrations induce the break up of the jet into single droplets with a diameter of around $30\text{ }\mu\text{m}$. During the injection of the droplet beam into the vacuum through a 7 cm long capillary, the droplets freeze due to evaporation and form a pellet beam. The beam is then collimated by a skimmer and lead through a thin 2 m long pipe into the scattering chamber to interact with the ion beam. The remaining pellets are collected 2m below the scattering chamber in the target beam dump. The effective pellet target thickness is in the order of $10^{16}\text{ atoms/cm}^2$ with a beam diameter of around 3 mm at the interaction point.

The transfer of the target began at the end of June with dismantling in Uppsala and shipment to COSY. After the arrival of the components in Jülich the pumps, cryo compressors and the hydrogen purifier were maintained. Furthermore, several components have to be modified to meet the later requirements at COSY.

In December 2005 the reassembly of the pellet station has been started in the "Bermudatriangle" at COSY for optimisation and test purposes. Here the size of the test frames have been chosen to simulate the later situation at COSY. By this information reflecting the final operation at COSY can be gained. The pellet generator, a test scattering chamber and



Fig. 2: Setup of the pellet target in the Bermudatriangle

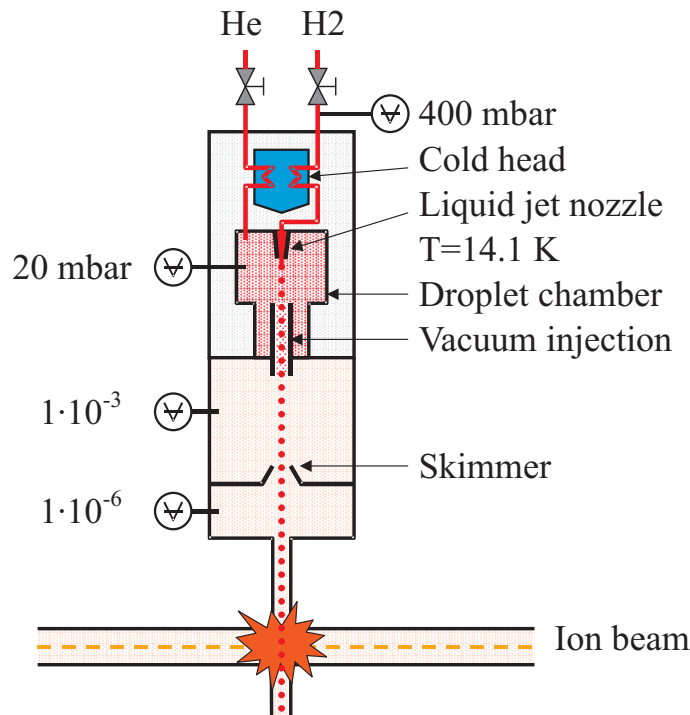


Fig. 1: Scheme of the WASA pellet generator

the beam dump were aligned optically and the pipes between them were installed. For an optimal access to the generator a scaffold was installed around the target frame.

The current status of the test station is shown in figure 2. The assembly will be finished in the January of 2006 followed by test measurements with the pellet target. The development of a glass nozzle production line in Jülich will be finished in 2006. In Summer 2006 the WASA pellet target is scheduled to be installed at the WASA-Experiment at COSY.

References:

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