

A Combined Target Station for Microprobe Analysis and Single Cell Irradiation at SNAKE

P. Reichart ^a, C. Greubel ^a, V. Hable ^a, P. Hartung, A. Hauptner, and G. Dollinger ^a

^a Universität der Bundeswehr München, Dept. für Luft- und Raumfahrttechnik LRT2, 85577 Neubiberg

A new target station has been developed at the microprobe SNAKE that meets the requirements for two contrary microbeam applications: (1) microprobe analysis and (2) single cell irradiation. Microprobe analysis is performed in a vacuum chamber that is located directly at the exit of the superconducting multipole lens where the target is placed at a working distance of about 100 mm on top of a 4-axis goniometer as shown in Fig. 1. Target and beam monitoring is possible through a newly custom designed optical long distance vacuum microscope that has a conical hole drilled in the objective for vertical viewing of the sample surface. It enables us to observe the target surface or do online beam characterization on a fluorescent crystal with an optical resolution close to 1 μm and a working distance of 10 mm. As a main application 3D hydrogen microscopy by proton-proton scattering will be possible for thick samples at proton energies of up to 25 MeV with a new detector setup [1]. This is mounted at the chambers exchangeable back flange. Other ports are designated for RBS, PIXE/PIGE microscopy and STIM. The detectors as well as the microscope are retractable, so that a needle beam can penetrate the analysis chamber and exit at a back-shifted focus via an adjustable exit nozzle for single cell irradiation. The cell irradiation setup for counted ion irradiation and online observation of living cells [2] in-

cludes a Zeiss Axiovert 200M microscope with its focus and the cells located directly at the beam exit. It is mounted on a high precision linear stage that enables us to quickly retract the complete setup by 1 m and switch back to analysis experiments with only replacing the back flange of the chamber (Fig. 2).

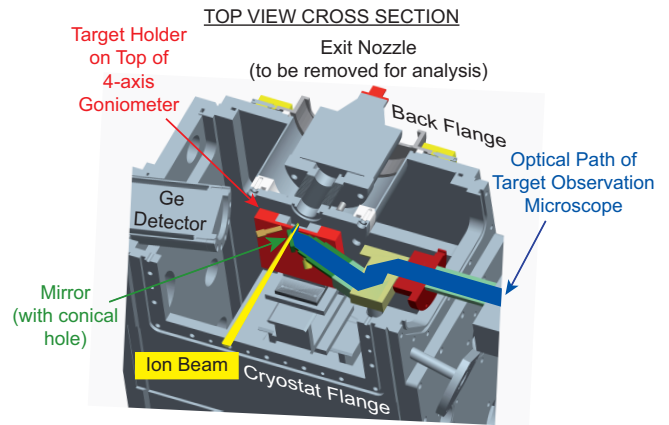


Fig. 1: Target station for microprobe analysis.

References

- [1] P. Reichart *et al.* Annual report 2006, p. 84
- [2] V. Hable *et al.* Annual report 2006, p. 63

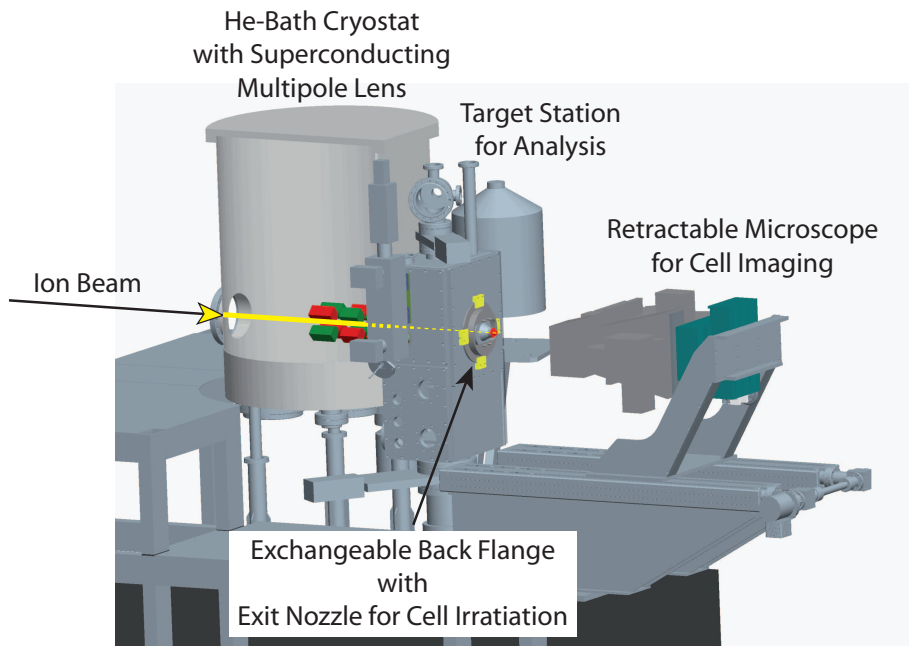


Fig. 2: New target station for combined analysis and cell irradiation.