

VA 3: Vacuum Systems and Tools

Time: Monday 14:40–15:20

Location: HFT-FT 131

VA 3.1 Mon 14:40 HFT-FT 131

Fast Ionization Chambers for Time Resolved XAFS Measurements — ●OLIVER MÜLLER, DIRK LÜTZENKIRCHEN-HECHT, and RONALD FRAHM — Bergische Universität Wuppertal

Time resolved XAFS (X-ray Absorption Fine Structure) methods, e.g. QEXAFS (Quick Extended X-ray Absorption Fine Structure) is a valuable tool for in situ investigations of materials of any kind. The increase in intensity at modern 3rd generation synchrotron radiation sources allow the acquisition of complete EXAFS spectra within a few milliseconds. To meet the increasing demand in time resolution and data quality specialized high speed ionization chambers have been build. By introducing a Frisch grid, the bandwidth of the ionization chambers could significantly be extended. It was shown that the improved step response of the new ionization chamber yield higher energy resolution of EXAFS spectra at very high acquisition frequencies.

VA 3.2 Mon 15:00 HFT-FT 131

Vacuum system design of the MITICA Test Facility - Challenges for the cryopump — ●SANTIAGO OCHOA, STEFAN HANKE, and CHRISTIAN DAY — Karlsruhe Institut of Technology KIT, Institute for Technical Physics ITEP, D-76344 Eggenstein-Leopoldshafen,

Germany

MITICA (Megavolt ITER Injector and Concept Advancement) is a testbed for the full-sized heating neutral beam injector currently being built in Europe and will start operation more than five years before the heating beam system will be used on the nuclear fusion device ITER.

In order for this neutral beam injector to heat the plasma properly a high ion fraction with small divergence has to be delivered and the demanding pressure profile along the beam line has to be achieved.

The vacuum system should overcome several challenges as the space available is limited, the pumping speeds needed are extraordinarily high, and strong temperature differences have to be considered in the design. A wrong design would lead to an insufficient pump performance, therefore to a higher pressure and consequently to problems as charge exchanges, voltage breakdowns or even back scattering of the beam.

In this work, it will be presented an overview of the requirements for the correct operation of the MITICA testbed, their classification in two groups: vacuum requirements and additional requirements for the specific case MITICA. Finally, it is shown how the vacuum system, designed by the Vacuum Group of the ITEP (KIT), accomplished them.