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NNP – Non Neutral Plasma Physics Group

IAP - Institute for Applied Physics
Max-von-Laue-Straße 1
D-60438 Frankfurt am Main, Germany

NNP Non Neutral Plasma Physics Group

IAP Institut für Angewandte Physik Frankfurt am Main

GOETHE UNIVERSITÄT FRANKFURT AM MAIN

SPWR 014
TUOP 05
TUPLR 075

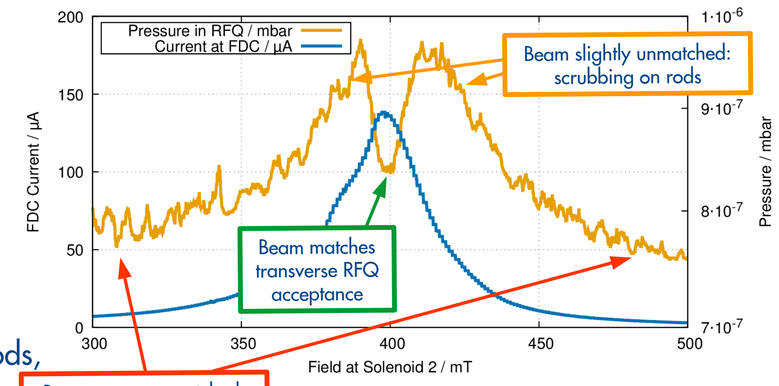
First Experiments at the CW-Operated RFQ for Intense Proton Beams

P. P. Schneider, D. Born, M. Droba, C. Lorey, O. Meusel, D. Noll, H. Podlech, A. Schempp, B. Thomas and C. Wagner

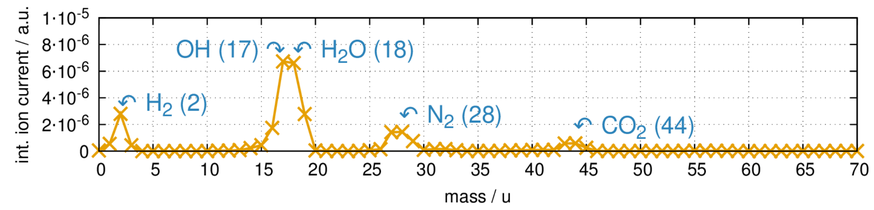
Ion Beam Scrubbing

To enhance the conditioning, the ion beam scubbing (IBS) technique with a He^+-beam was used in this RFQ.

- sweep over transverse acceptance of the RFQ at constant forward power
- pressure rises with increasing beam loss on the rods, thus ions scrub off contaminations from the rods
- in case of matching the transverse acceptance, the transport mode transmits the beam through the RFQ => lower losses on the rods so that the current rises but the pressure drops

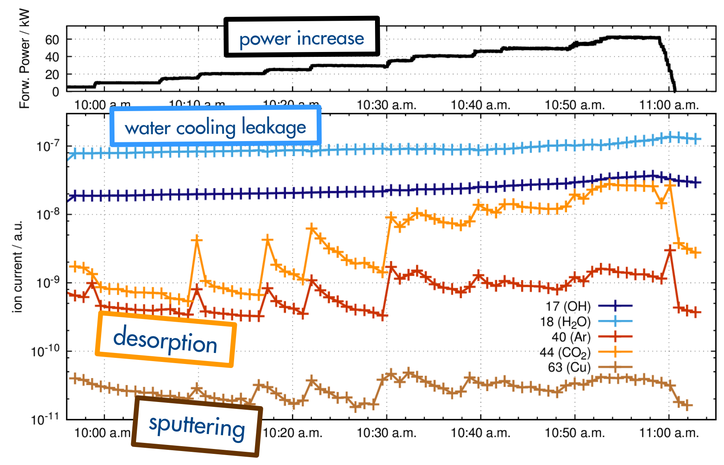


Mass Spectrometry

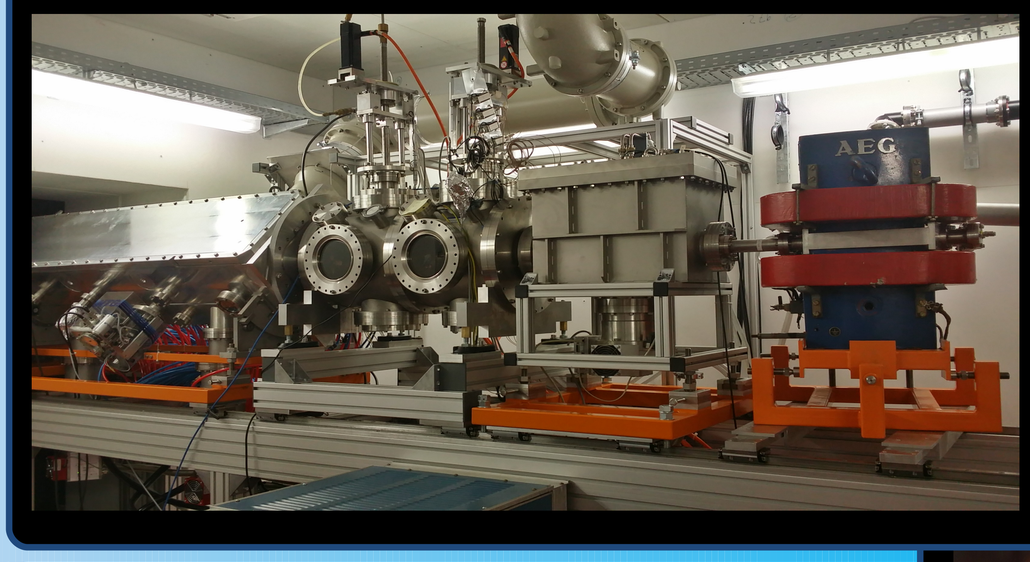


Three sources of particles are identified:

- leakage from the cooling circuit (H_2O & OH)
- surface desorption (Ar & CO_2)
- sputtering effects (Cu)

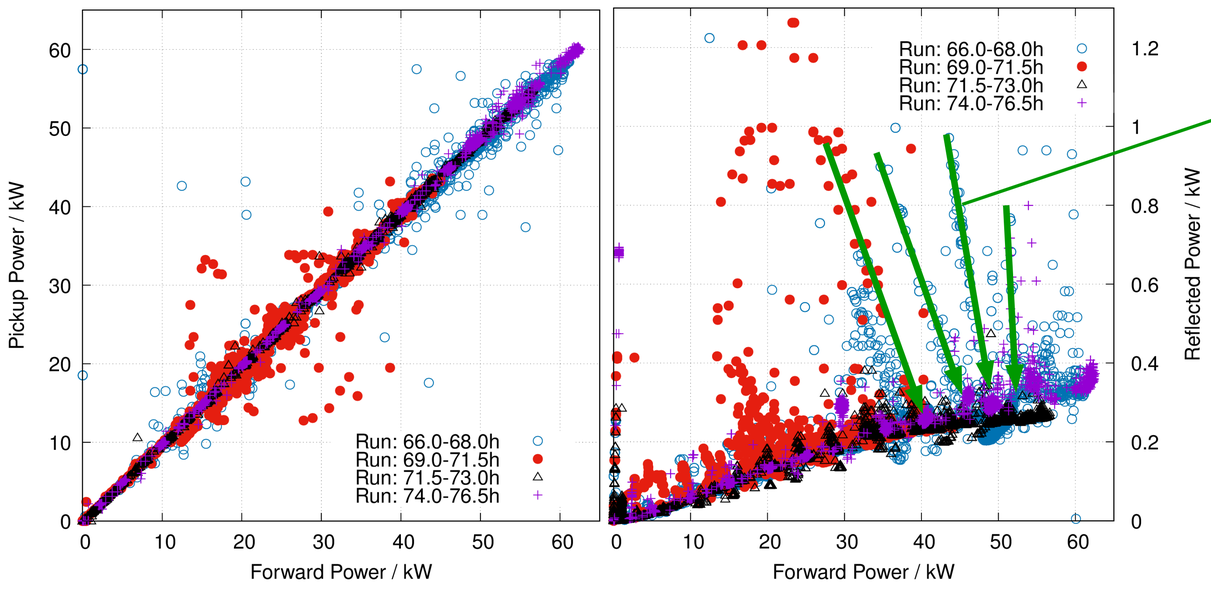


Experimental Setup



RFQ Matching Section

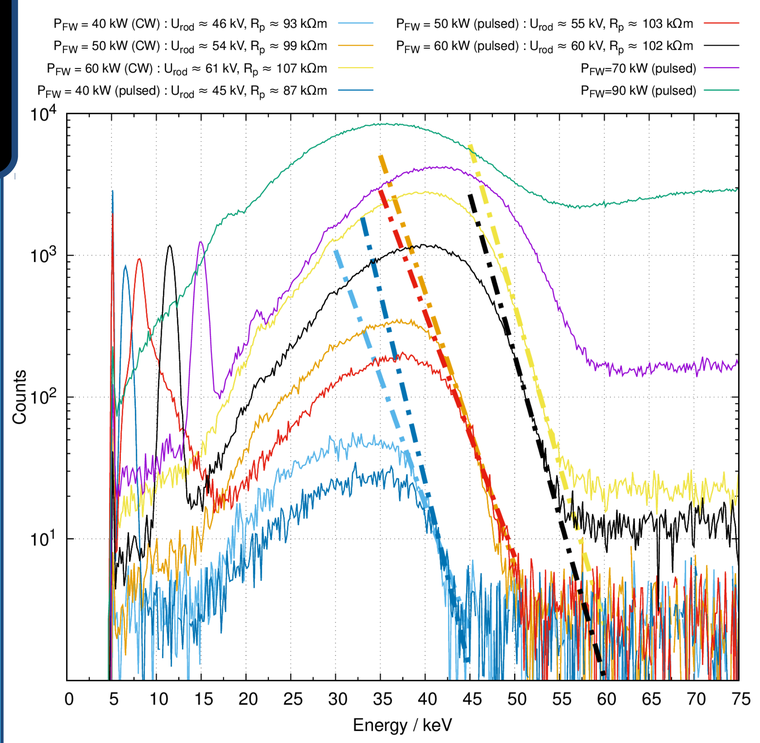
Coupling



Green arrows indicate that the dynamical tuner retunes the RFQ at increasing forward power. At better tuning the reflection sinks to a minimum.

X-Ray Spectrometry

X-ray spectrometry is performed to determine the electrode voltage and the R_p-value for the RFQ at different power levels.



Accumulated Operation Hours of the RFQ