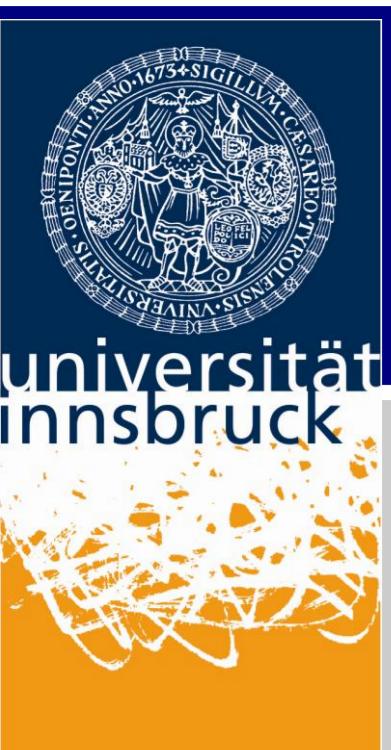


BESTOF – a versatile apparatus for fusion relevant experiments



Ion Applied Physics

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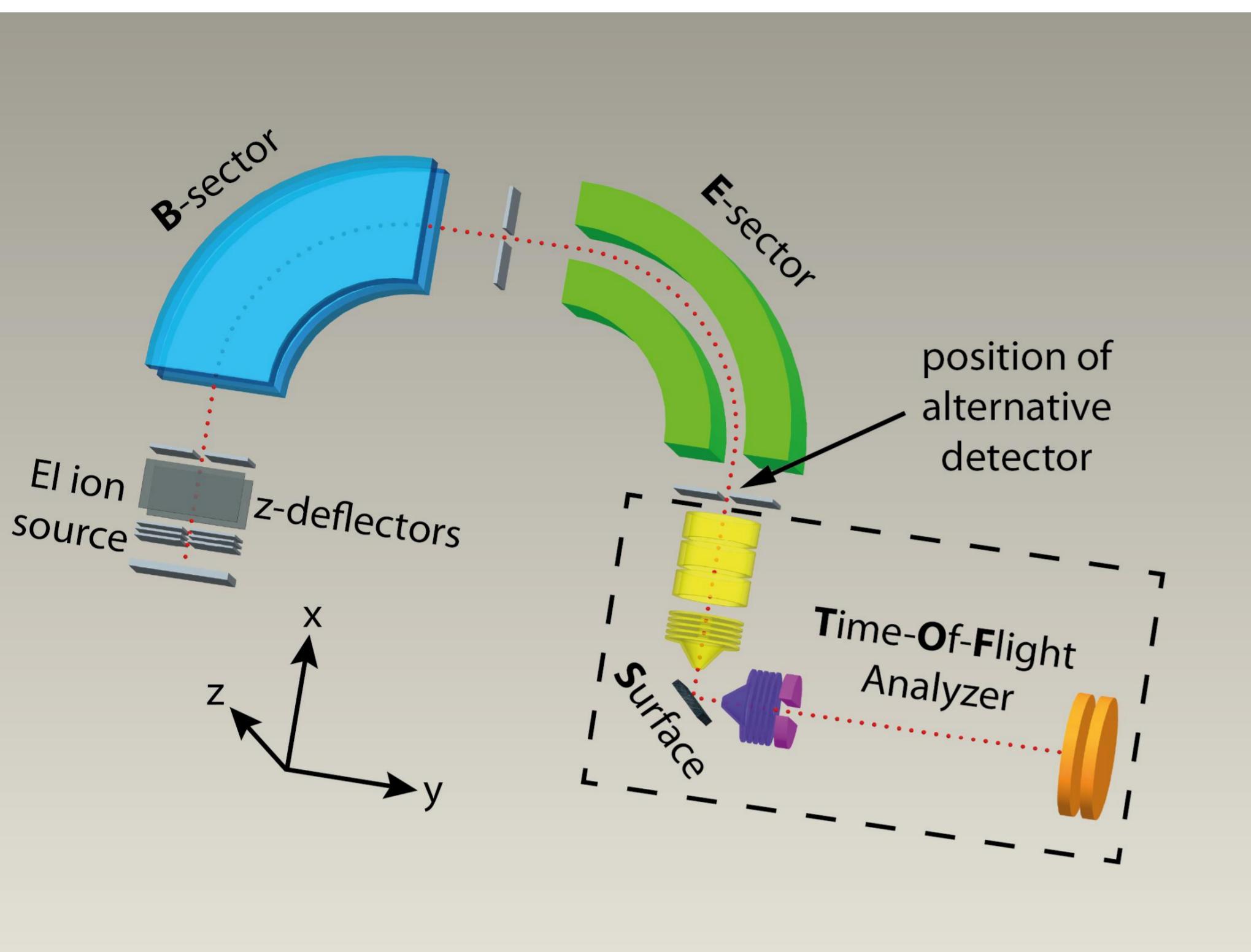
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Experimental setup



Electron ionization source: Ions are produced in a Nier-type ion source and accelerated to 3keV kinetic energy

Z-deflectors after the ion source allow for steering of the ion beam in vertical direction and hence to measure z-profiles

Mass analyzer: The projectile is mass selected by a double focusing two sector field mass spectrometer

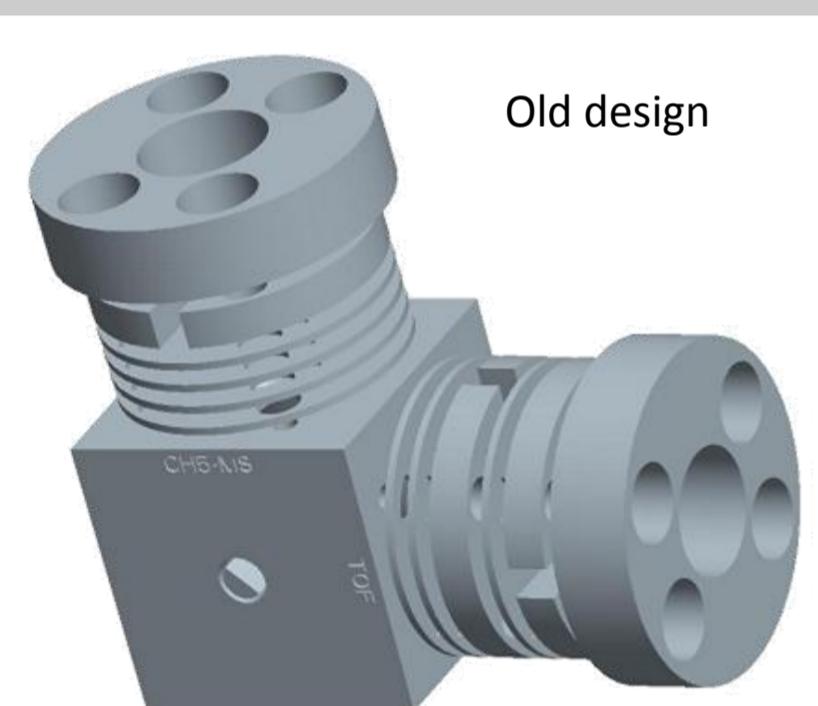
A **channeltron detector** is used for the cross section measurements

Tandem-MS for ion-surface interaction measurements:

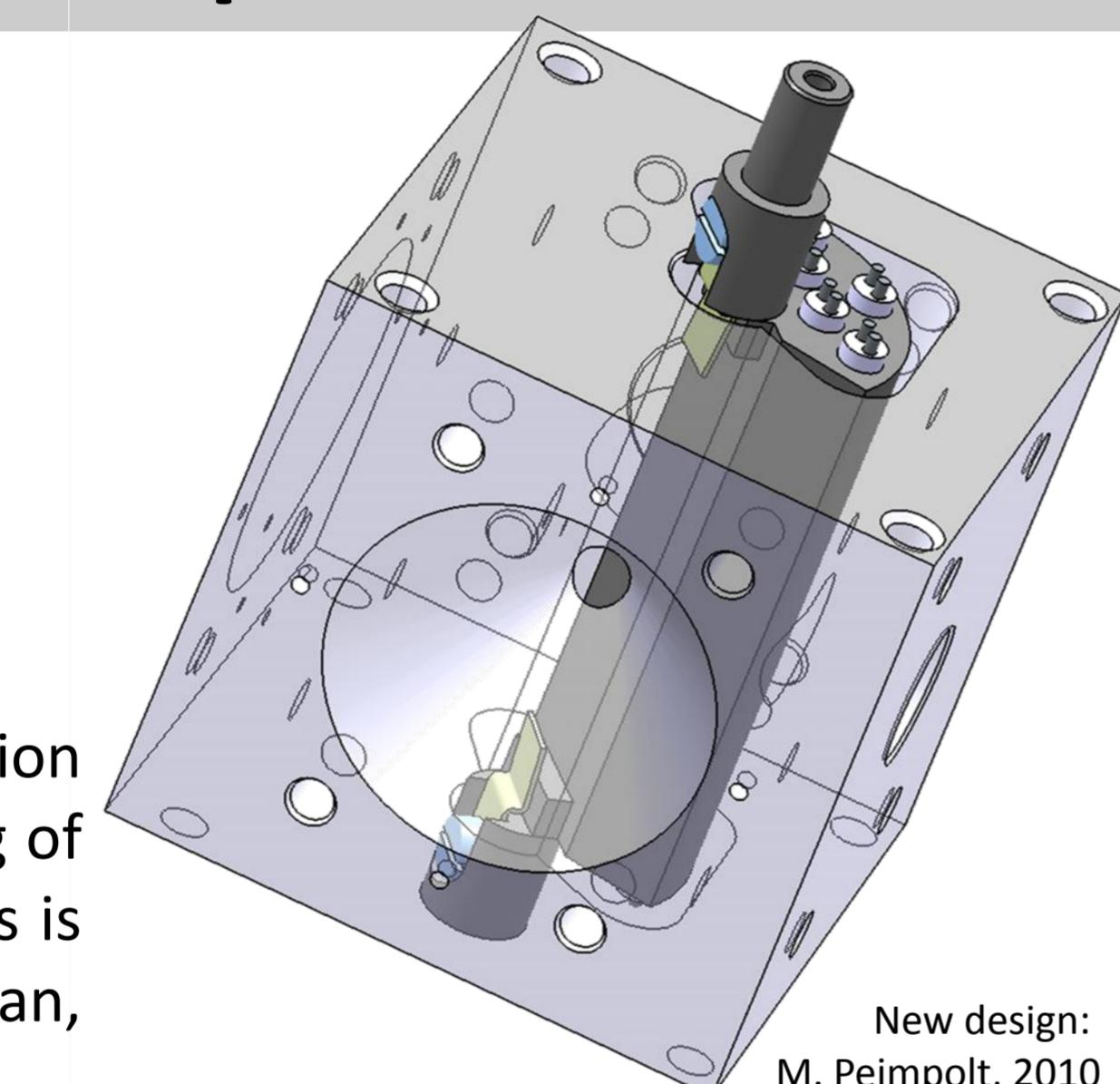
The ions are decelerated to well defined incident energies in the range $E_{inc} = 5\text{-}100\text{eV}$ and impinge onto the **heated surface sample** at an angle of 45°.

Product ions are accelerated to 3keV and analyzed in a linear **time-of-flight** mass spectrometer.

Heated surface samples

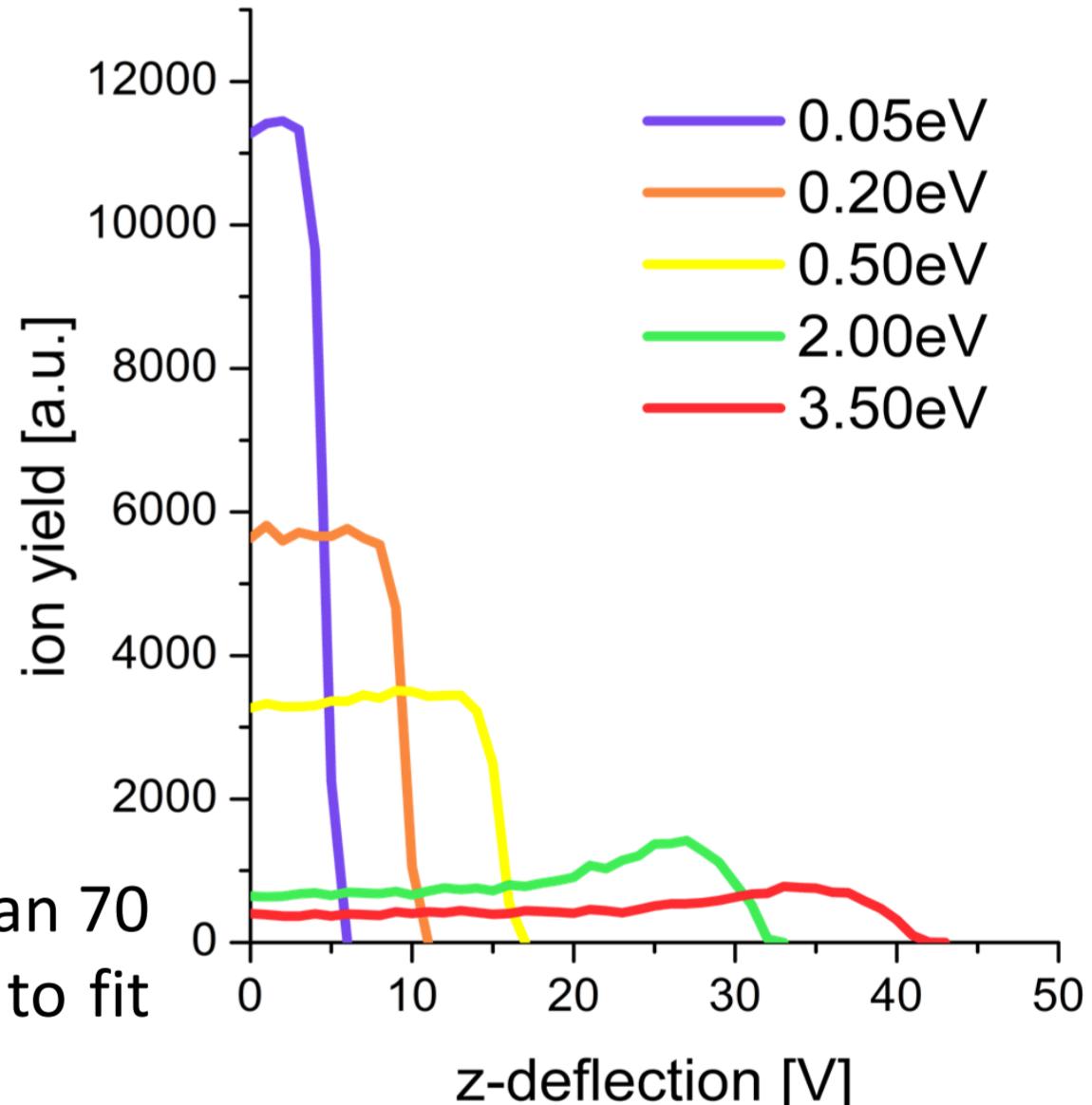
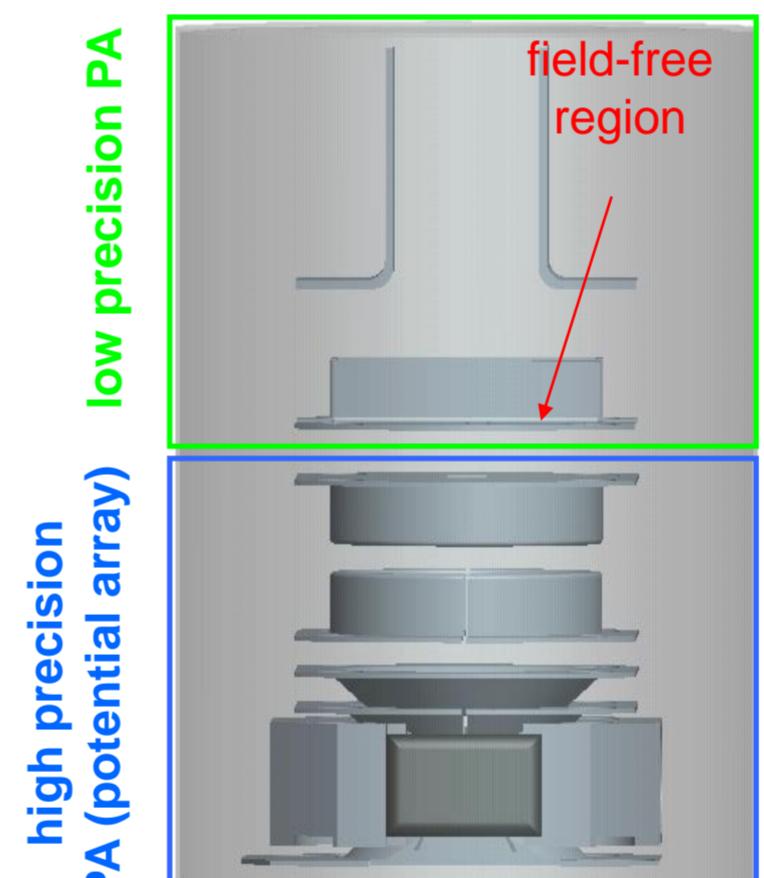


Old design



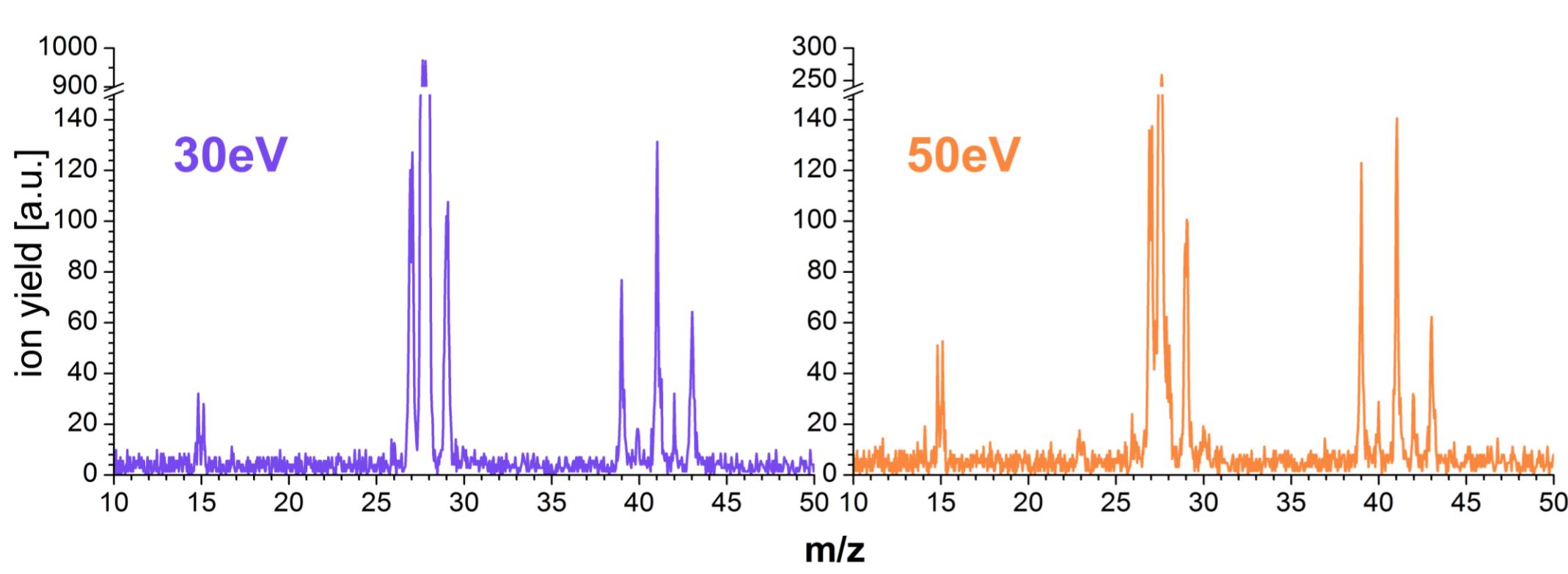
A new design of the interaction region allows for the heating of the surface up to 600°C. This is necessary to provide a clean, uncovered surface [1].

Simulated z-profiles



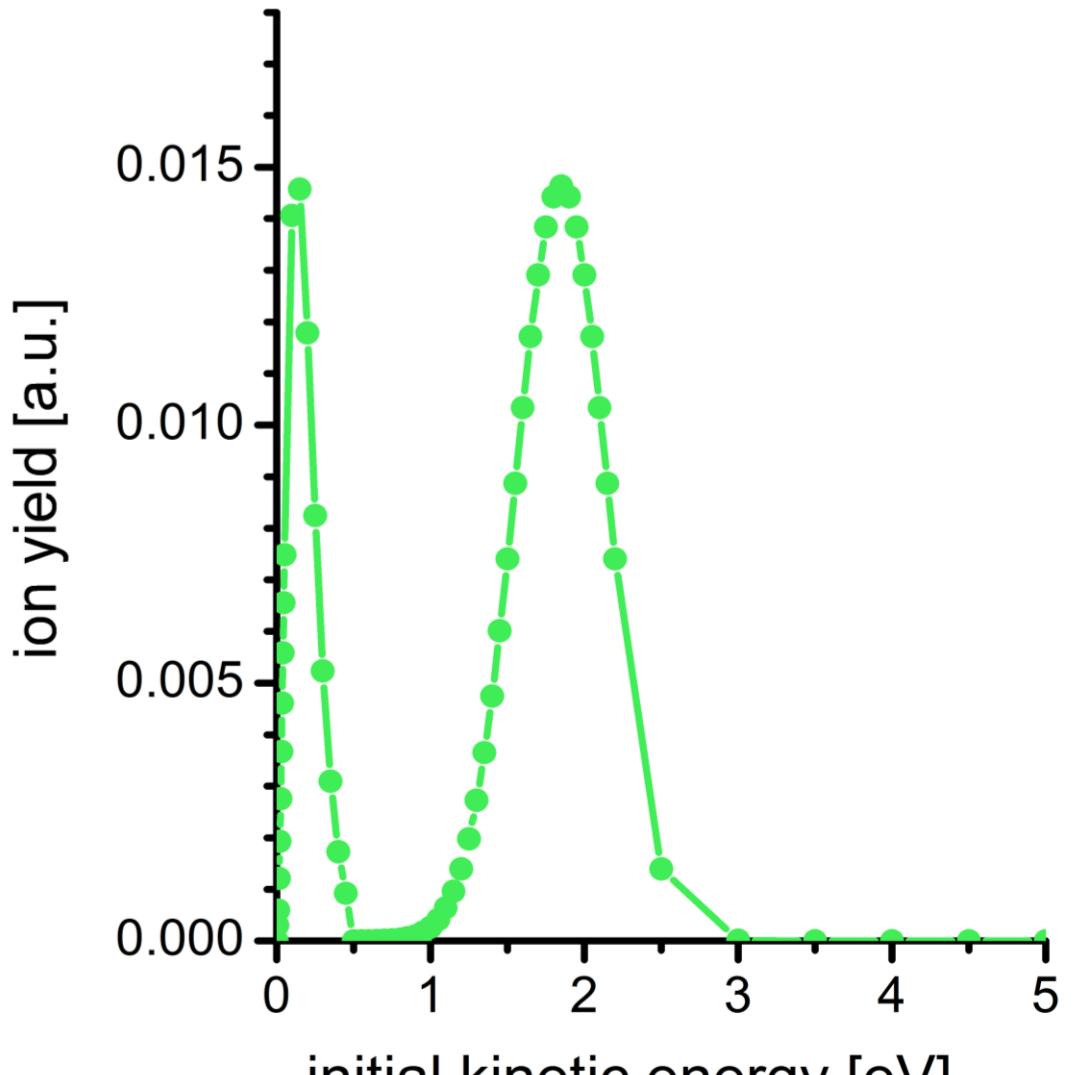
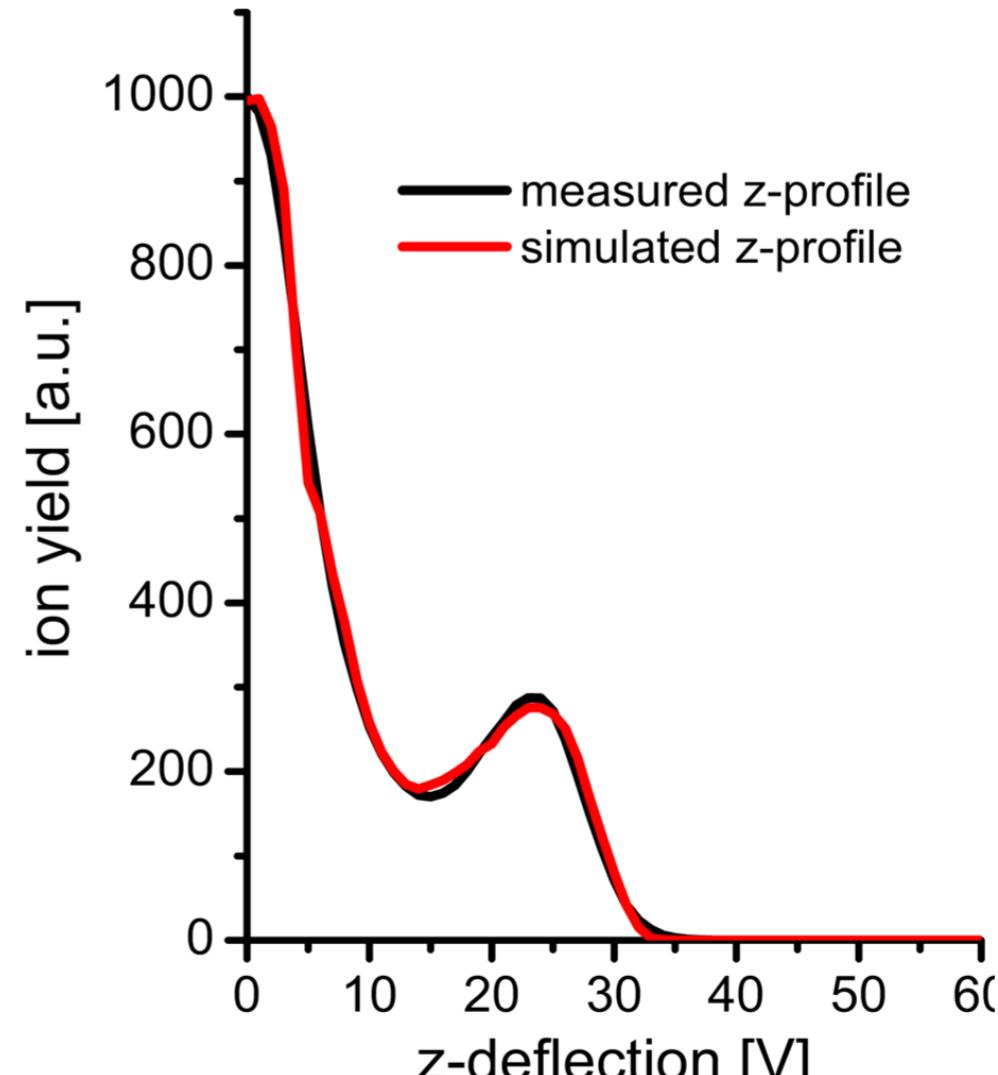
Simulated z-profiles for more than 70 initial kinetic energies are used to fit the measured z-profiles [3].

Product ion mass spectra (N_2^+)



Product ion mass spectra of ion-surface interactions of N_2^+ with carbon-fibre-composite (CFC) heated to 150°C show extensive contribution of sputtered surface hydrocarbons, similar to data for Ar^+ with room temperature CFC (poster by S. Zöttl and [2]).

Kinetic energy distribution of CH_3^+ from propane



[1] J. Roithova, J. Žabka, Z. Dolejšek, Z. Herman, J. Phys. Chem. B 106, 8293 (2002)

[2] A. Keim, B. Rasul, N. Endstrasser, P. Scheier, T. D. Märk, Z. Herman, Int. J. Mass Spectrom., available online doi:10.1016/j.ijms.2010.11.002 (2010)

[3] S. Feil, K. Gluch, A. Bacher, S. Matt-Leubner, D. K. Böhme, P. Scheier, T. D. Märk, J. Chem. Phys. 124, 214307 (2006)

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