

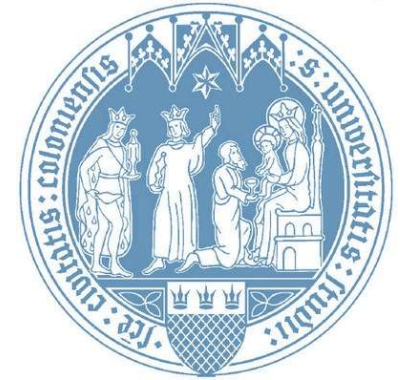
INTRODUCING A NEW GUIDED ION BEAM INSTRUMENT - NOVion

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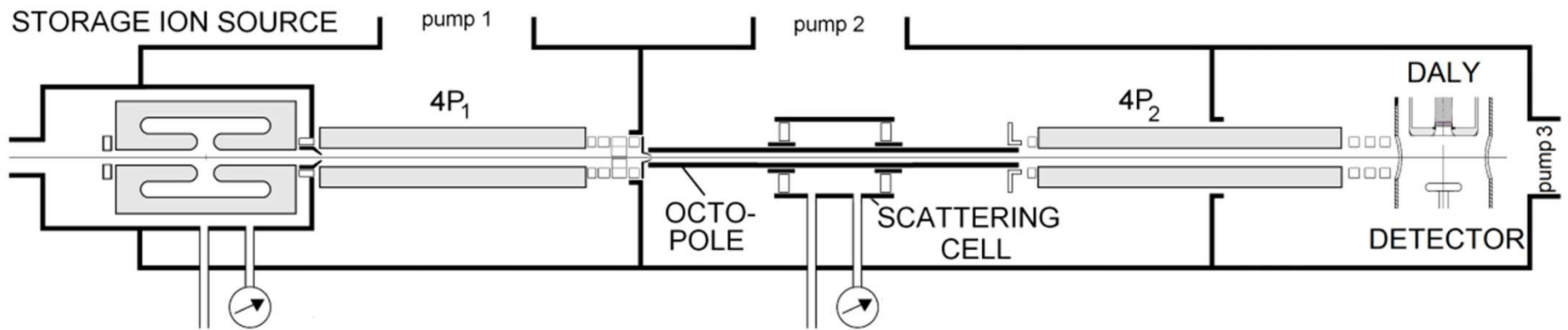
NOVion

Guided Ion Beam instrument

Aim: Measuring absolute integral cross sections for collisions between ions and neutrals

Purpose: to understand elementary processes occurring in any kind of technical or astrophysical low temperature plasmas

Experimental setup:





- Primary ions are produced in a storage ion source (SIS) by electron bombardment of neutral gas or a mixture of gases
- Variety of different ions can be produced and stored
- The ions internal energy can be influenced by changing the storage time, the electron energy, or the number density of primary and buffer gas in the SIS
- Ions produced in the SIS are mass selected using a first quadrupole ($4P_1$) and transferred into the octopole (8P) ion guide
- The octopole guides the ions (in inhomogeneous electric radio frequency fields) through the scattering cell (SC)

- Collisions between primary ions and neutral target gas occur in the SC
- The collision energy can be changed by superimposing a DC potential to the rf voltage of the 8P
- To determine the laboratory energy of primary ions, two methods are available: retarding potential method and time of flight (TOF) method
- From the 8P, after collisions, the primary and product ions are transferred to the second quadrupole ($4P_2$), mass selected, detected by a Daly type ion detector and counted

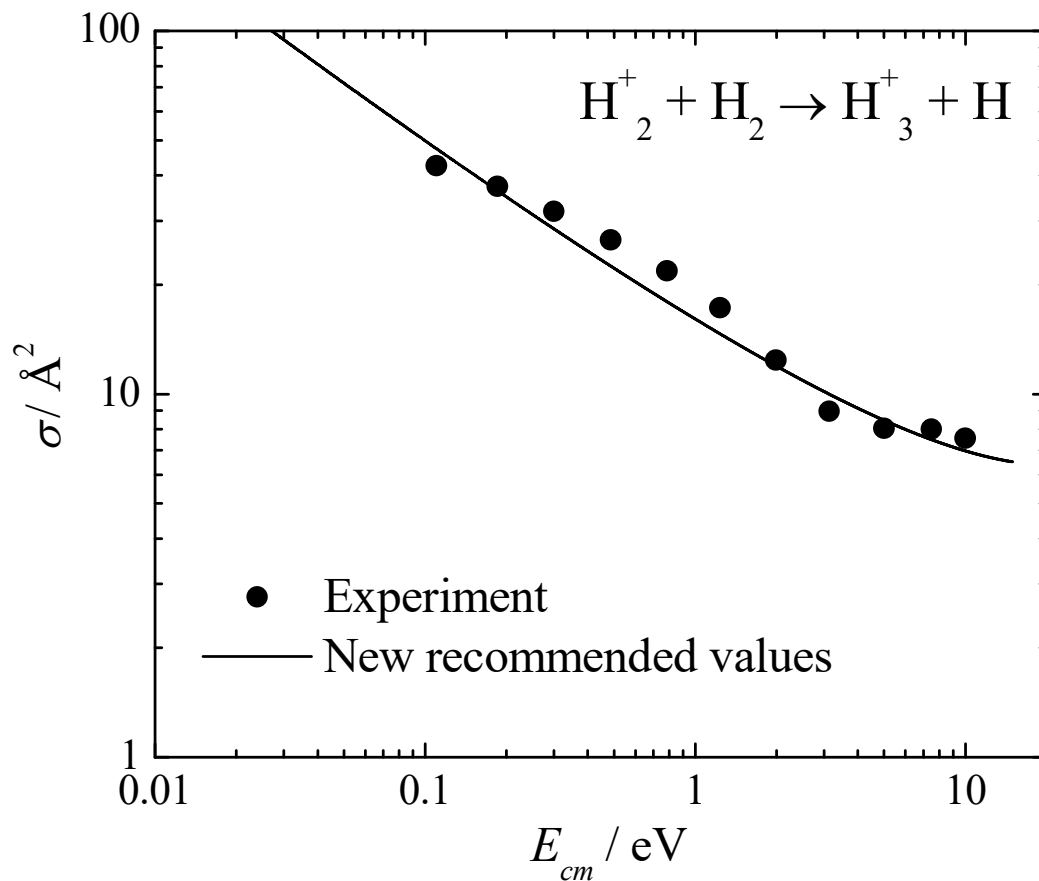
FIRST RESULTS

Absolute integral cross sections for reaction of great importance for hydrogen plasmas :



have been measured

- Results and a new analytical function recommended for the energy dependence of the cross section are shown



I. Savić, S. Schlemmer, D. Gerlich, *Formation of H_3^+ in collisions of H_2^+ with H_2 studied in a Guided Ion Beam Instrument*, *ChemPhysChem* (2020), <http://dx.doi.org/10.1002/cphc.202000258>



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