Status of the FRS-Ion-Catcher

- Motivation and Introduction
- Range straggling and bunching
- Status of the FRS-IC and its components
- Outlook

Collaborators

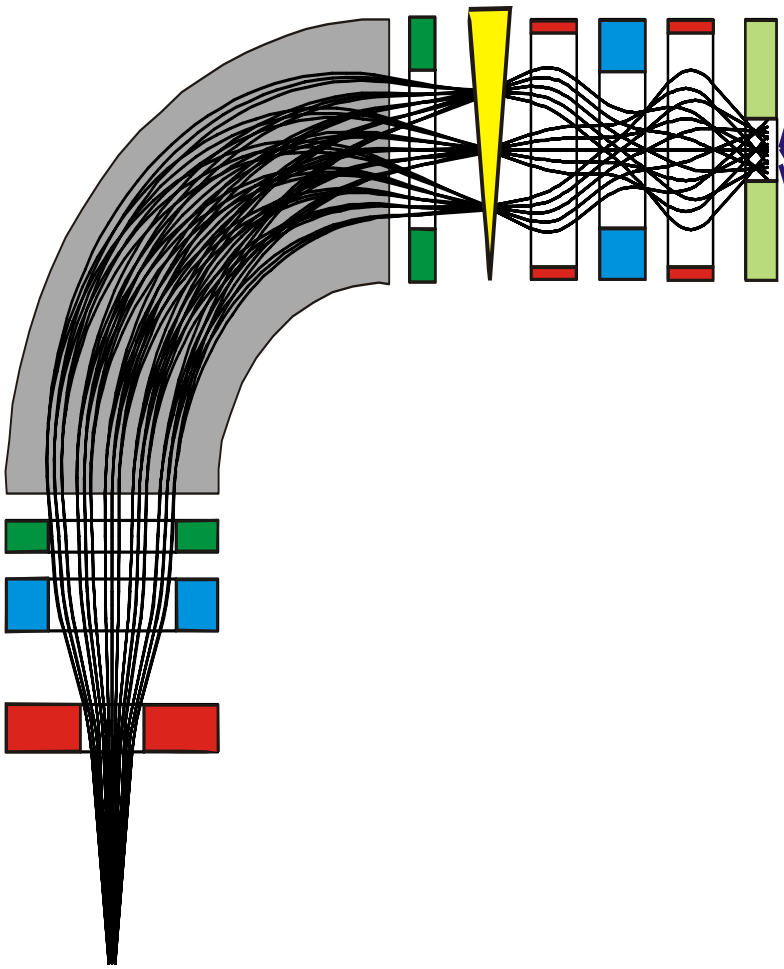
- GSI
- Uni Giessen
- ANL
- Leuven
- MSU
- Riken

FRS users meeting 2003

GSI
12. – 14. 02. 2003
Michael Maier

Low energy branch of the Super-FRS

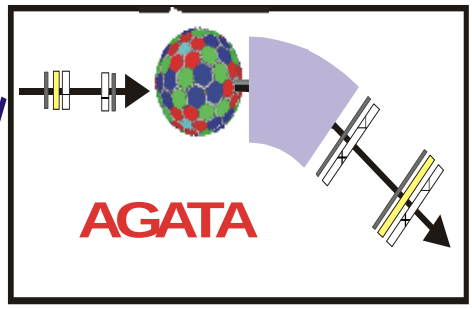
Provides exotic nuclei
at low energies for
a variety of experiments



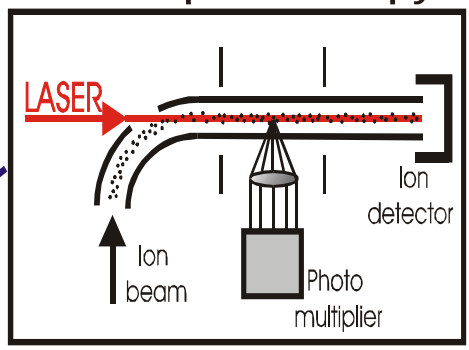
Exotic nuclei from
SUPER-FRS with
different momenta

+δp, p, -δp

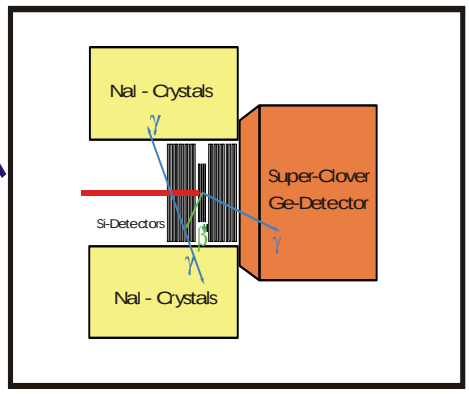
γ-ray spectroscopy



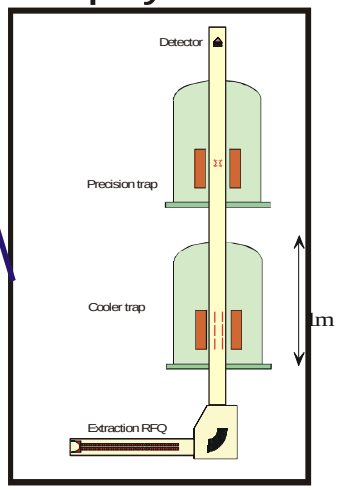
LASER spectroscopy



Decay spectroscopy



Trap system



The FRS-IC, a schematic overview

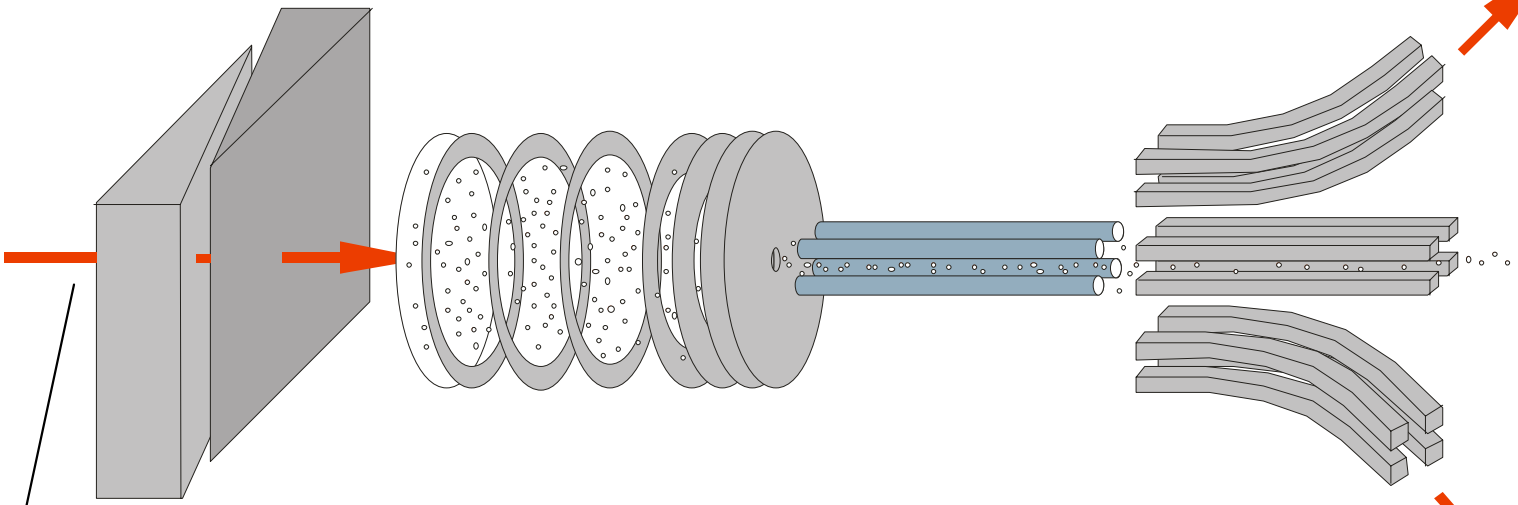
Energy Degrader / Buncher (GSI/Giessen)

Gas Cell (ANL)

Extraction RFQ (MSU)

RFQ Ion Distribution System (Giessen)

Decay spectroscopy



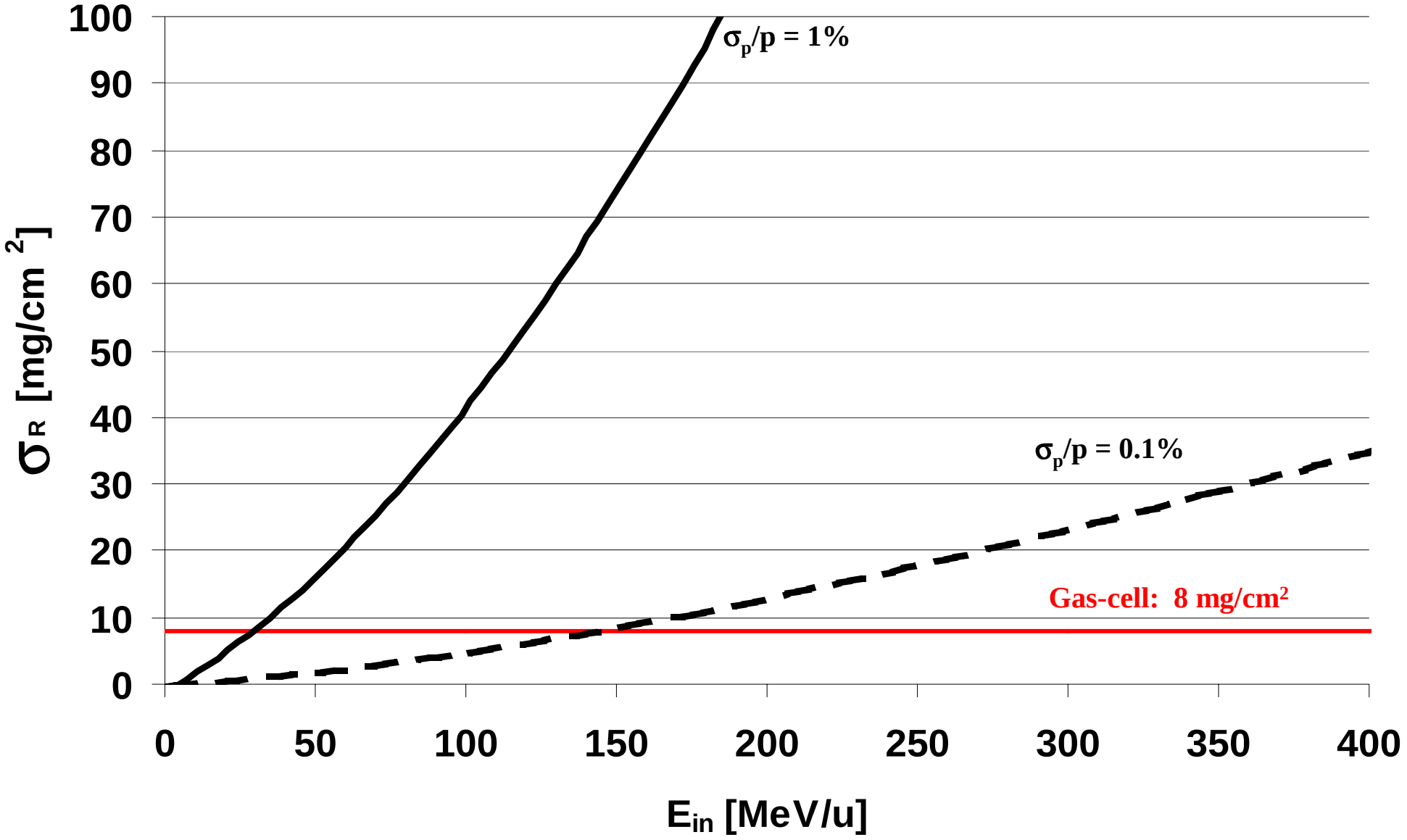
Laser spectroscopy

Low energy mass spetrometry

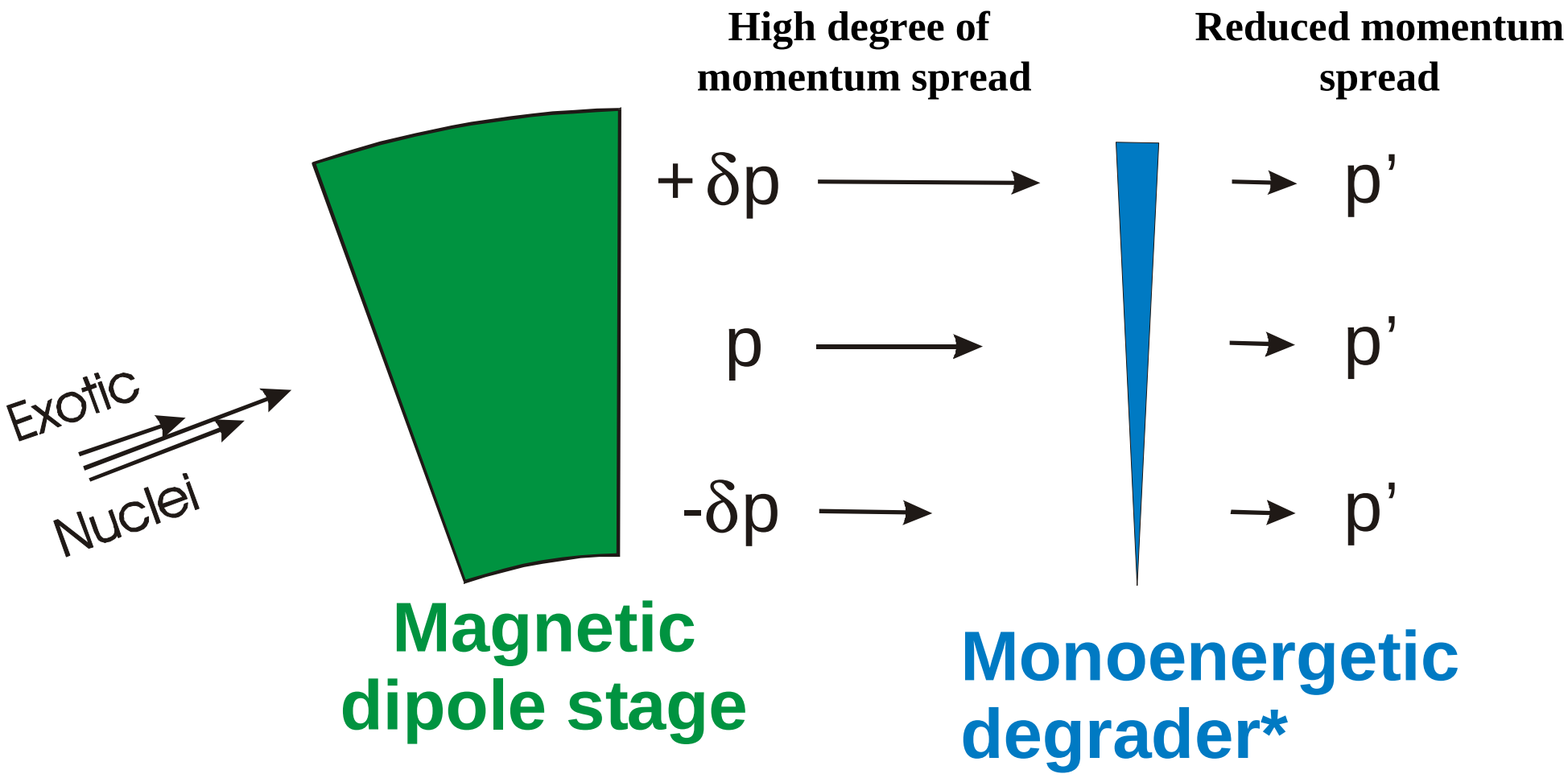
Beam from FRS 50 - 1000 MeV/u all elements (H-U) (GSI)

Range straggling for ^{56}Ni versus E_{in}

calculated for 1% and 0.1% initial momentum spread
using the stopping powers and straggling predictions of ATIMA

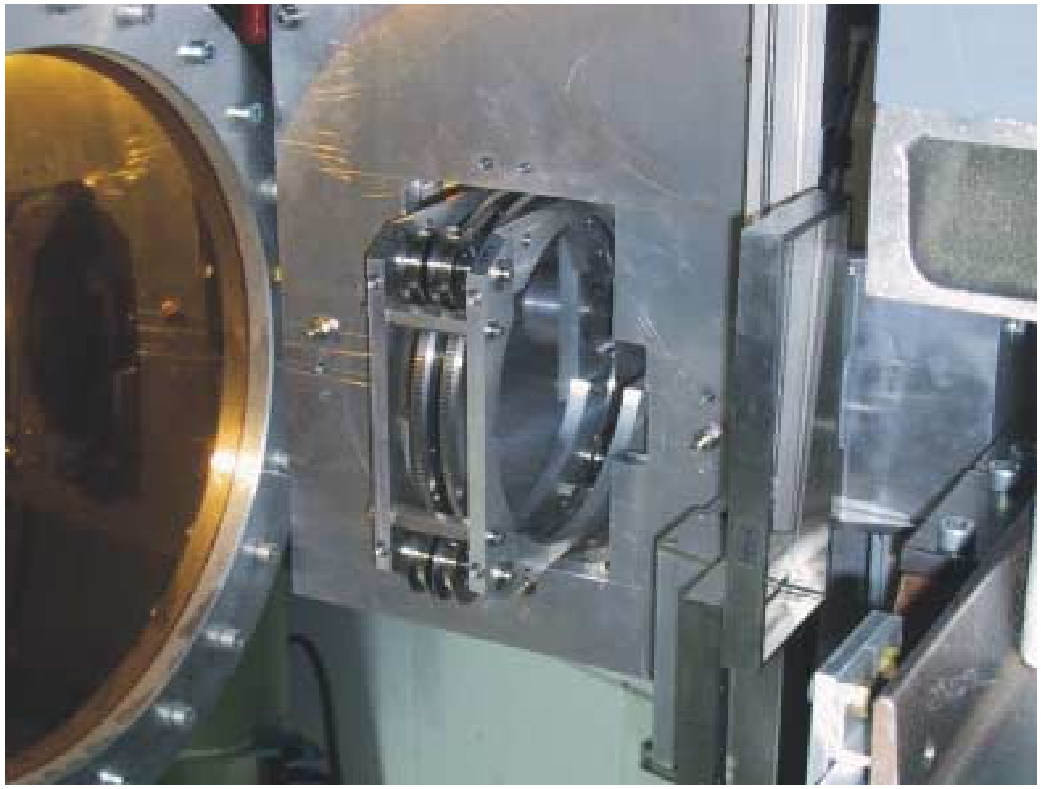


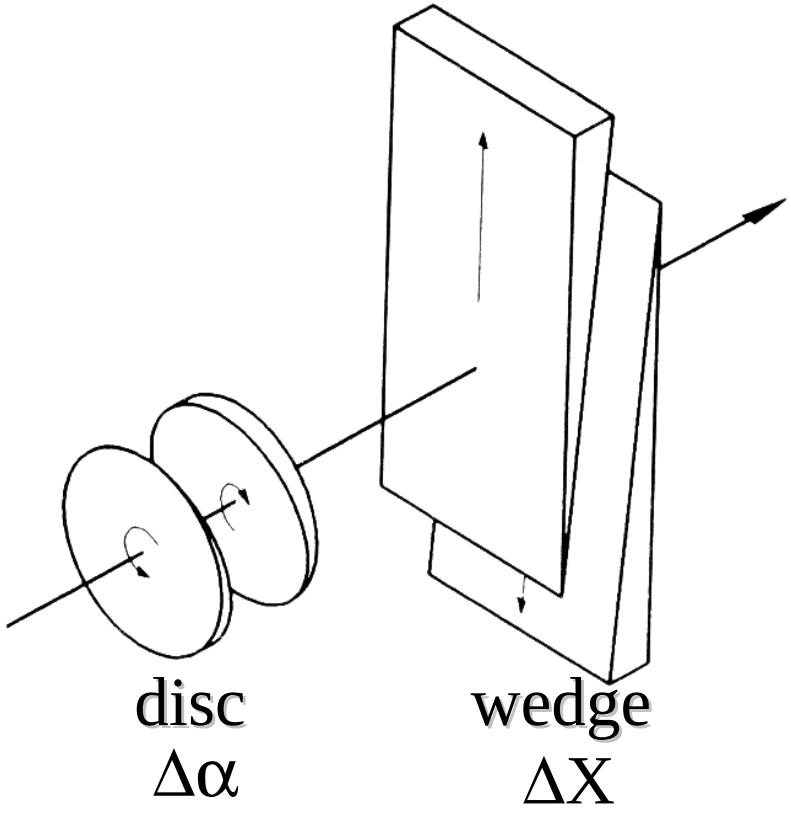
Principle of range bunching



* H. Geissel et al., NIM A 282 (1989)

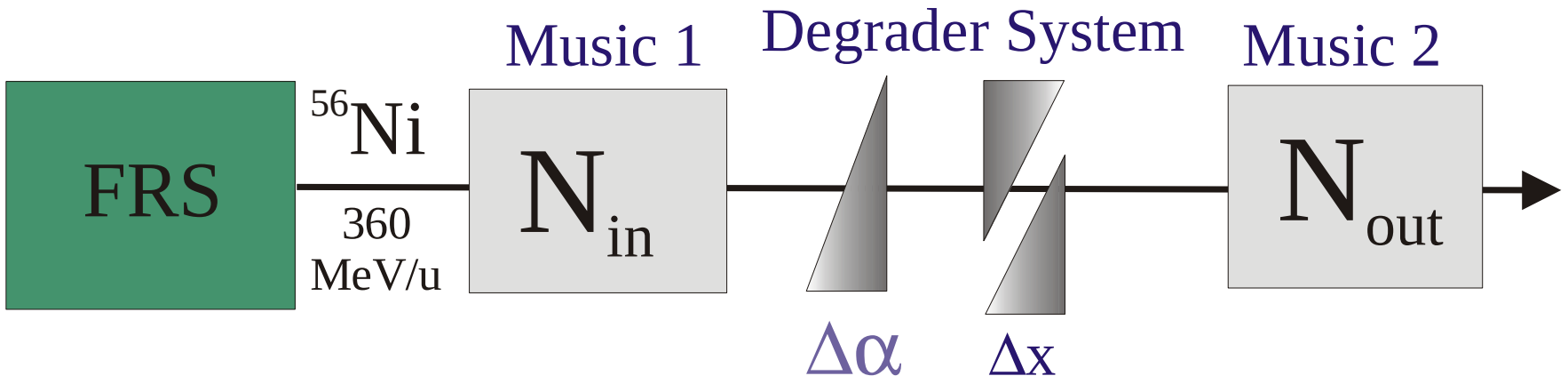
The degrader system

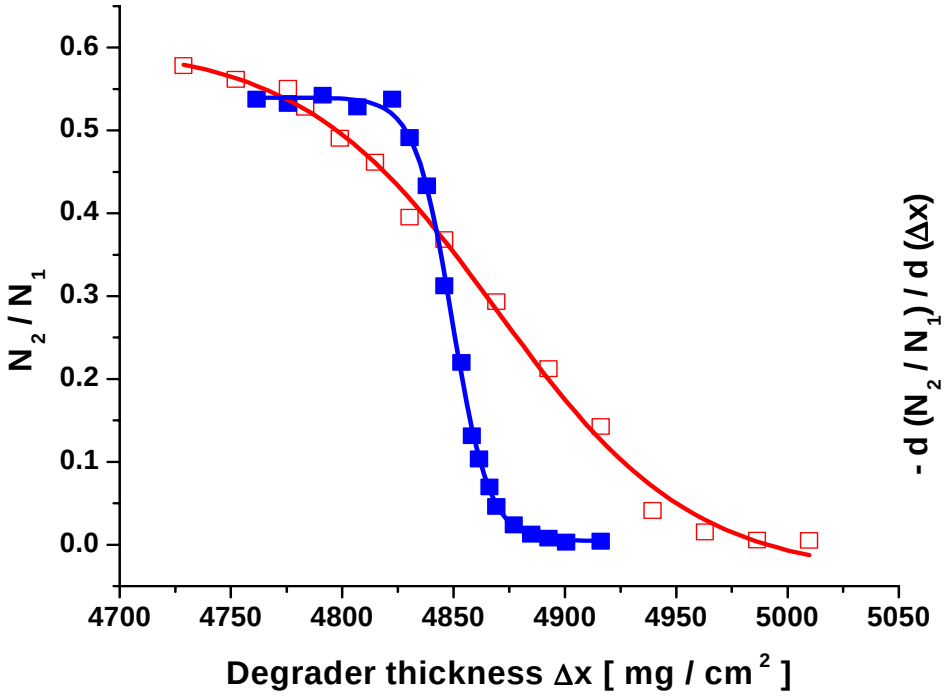


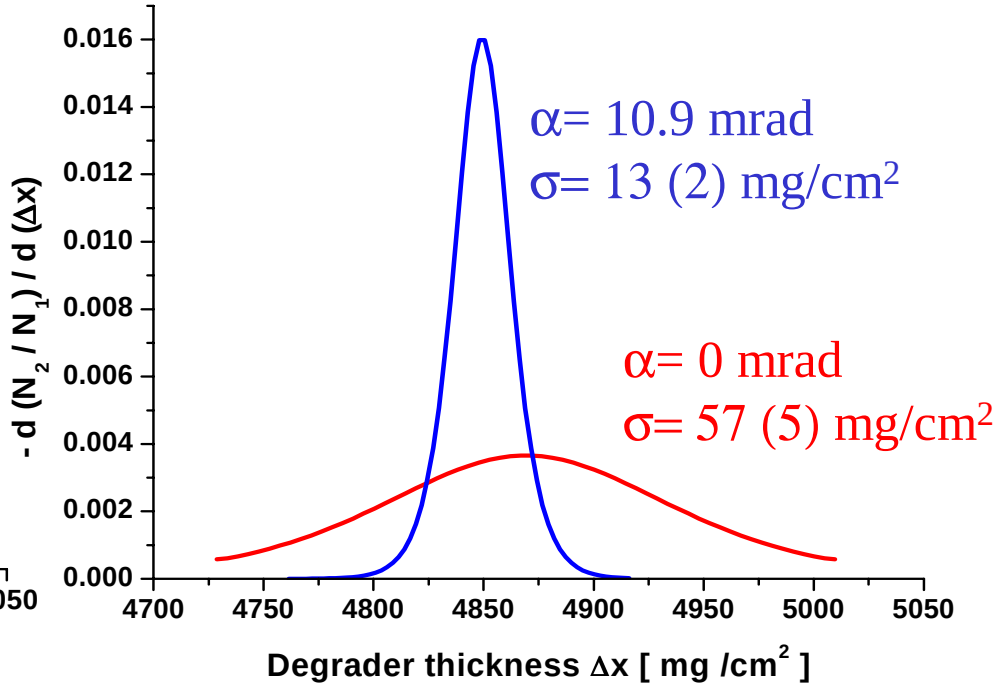


- monoenergetic disc-degrader to vary the angle
- homogeneous wedge-degrader to adjust a uniform thickness

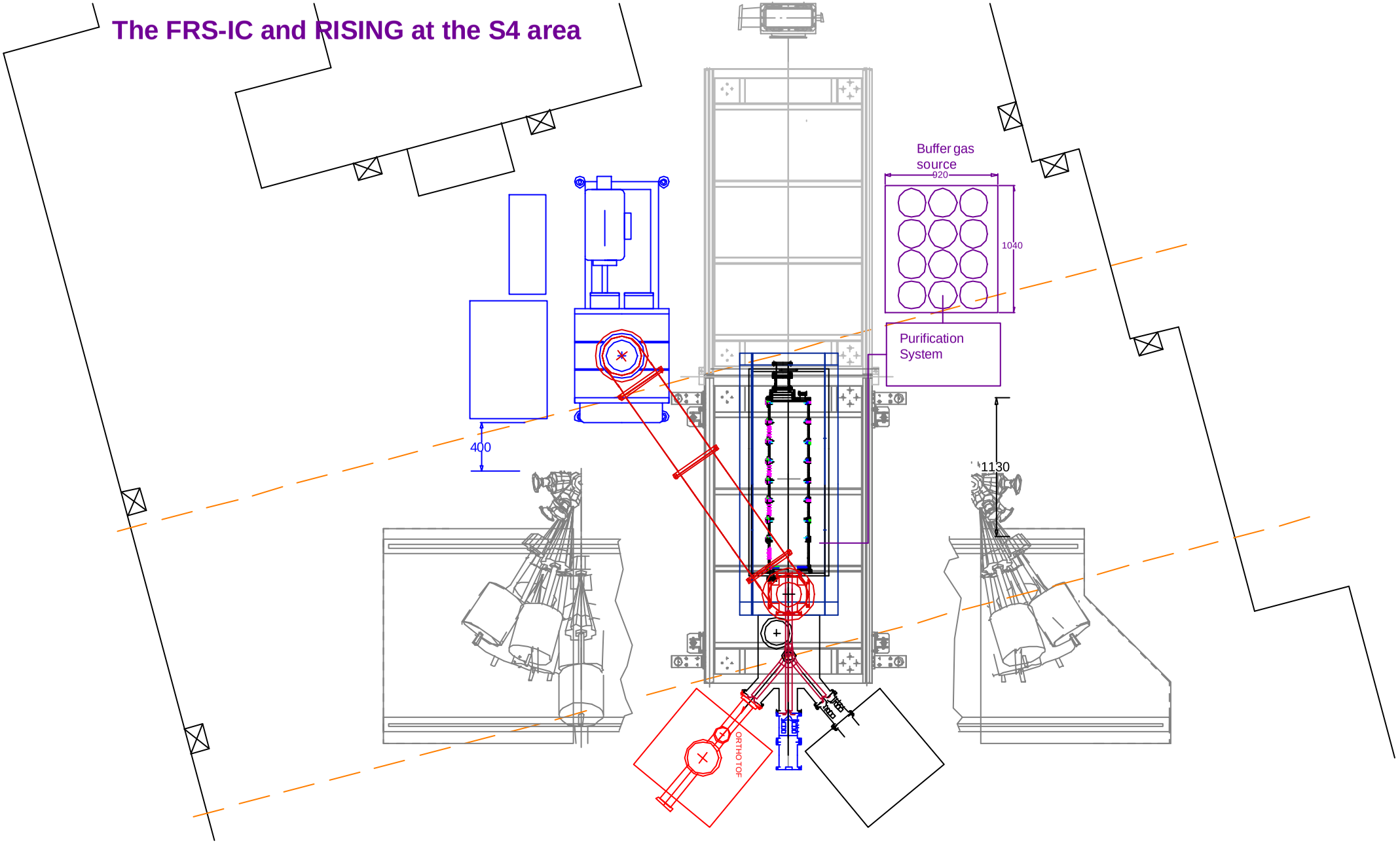
Measured range straggling of ^{56}Ni



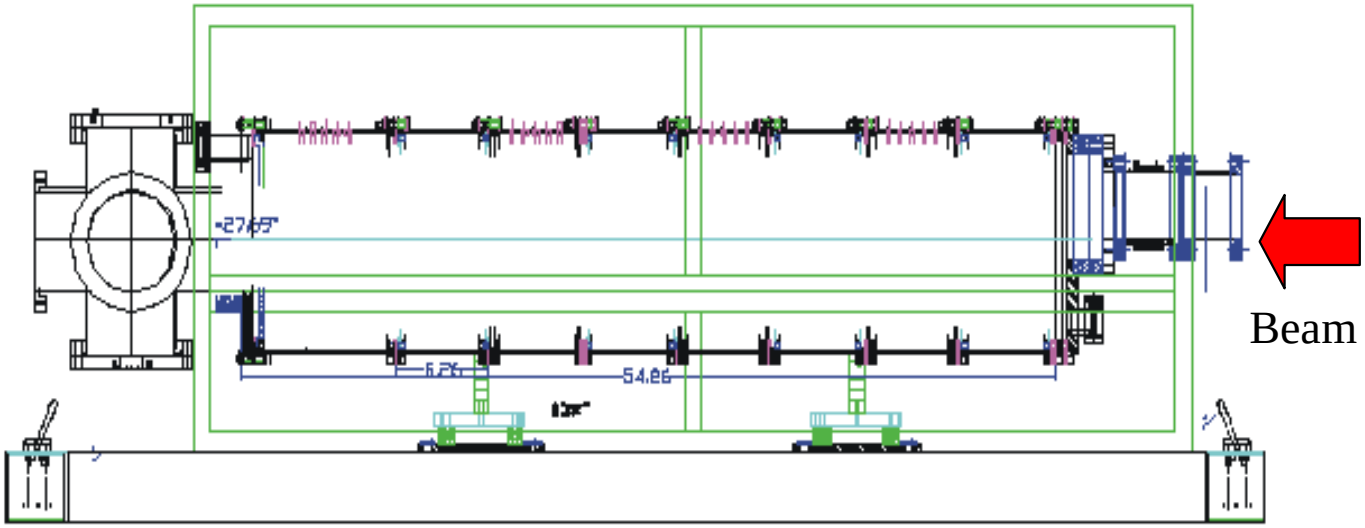




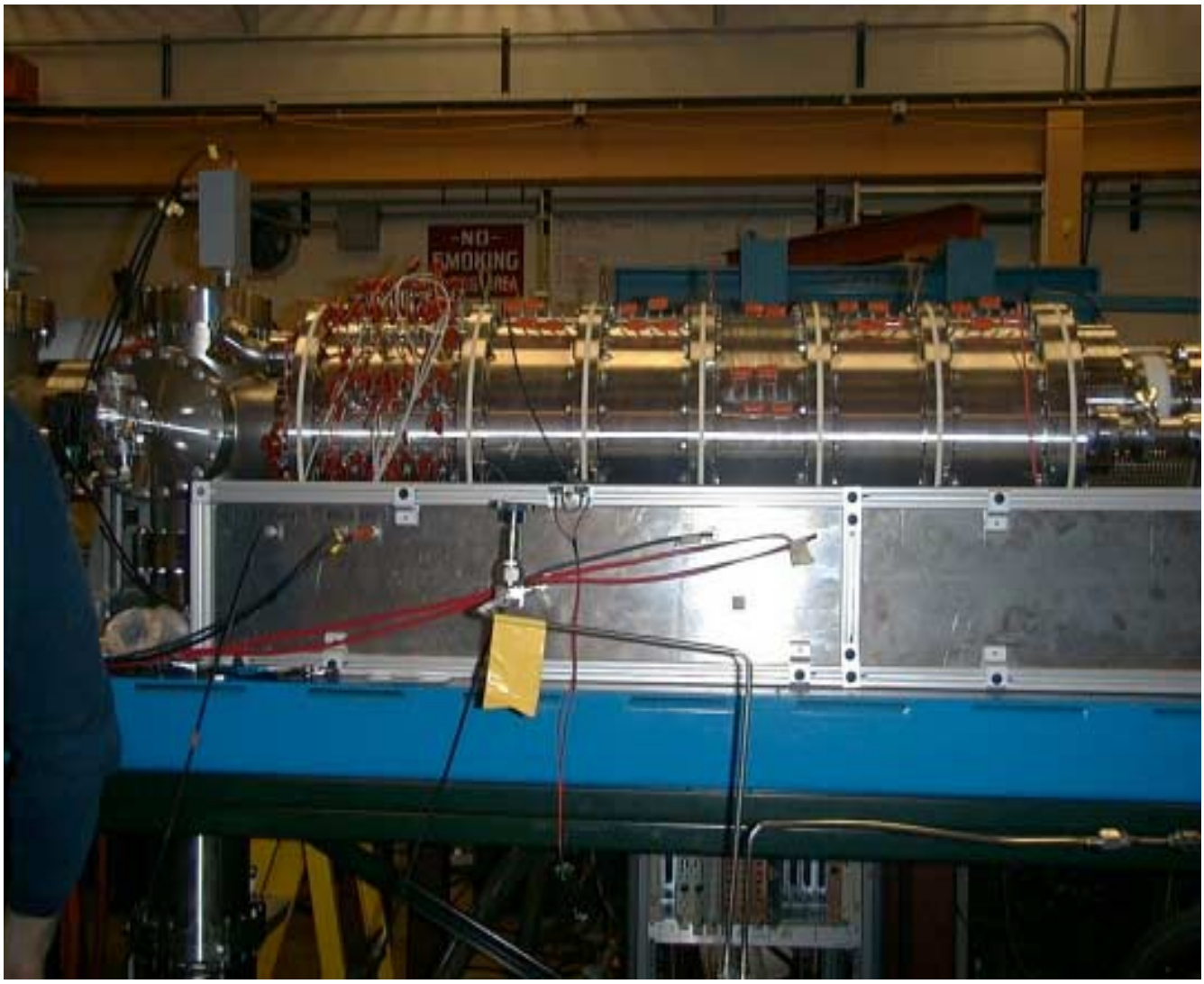
The FRS-IC and RISING at the S4 area



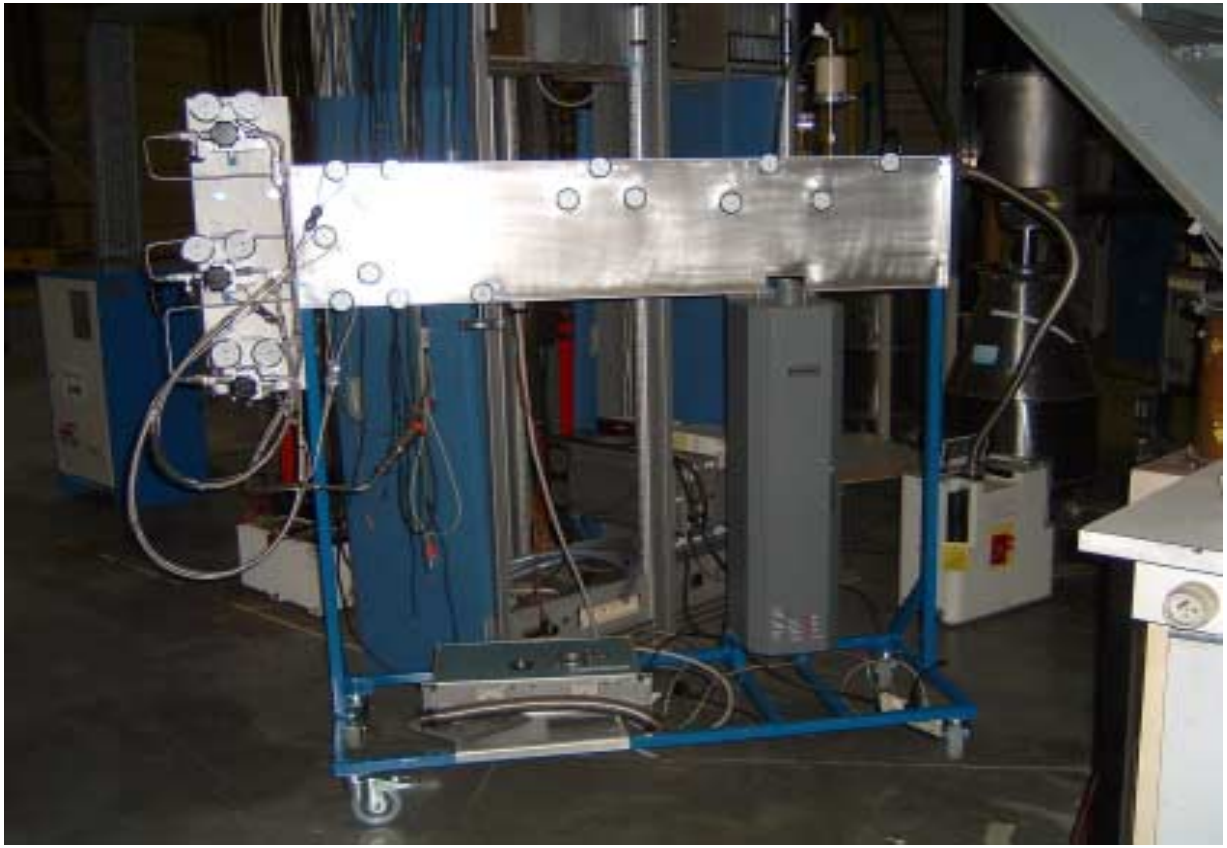
The Gas cell and Extraction RFQ

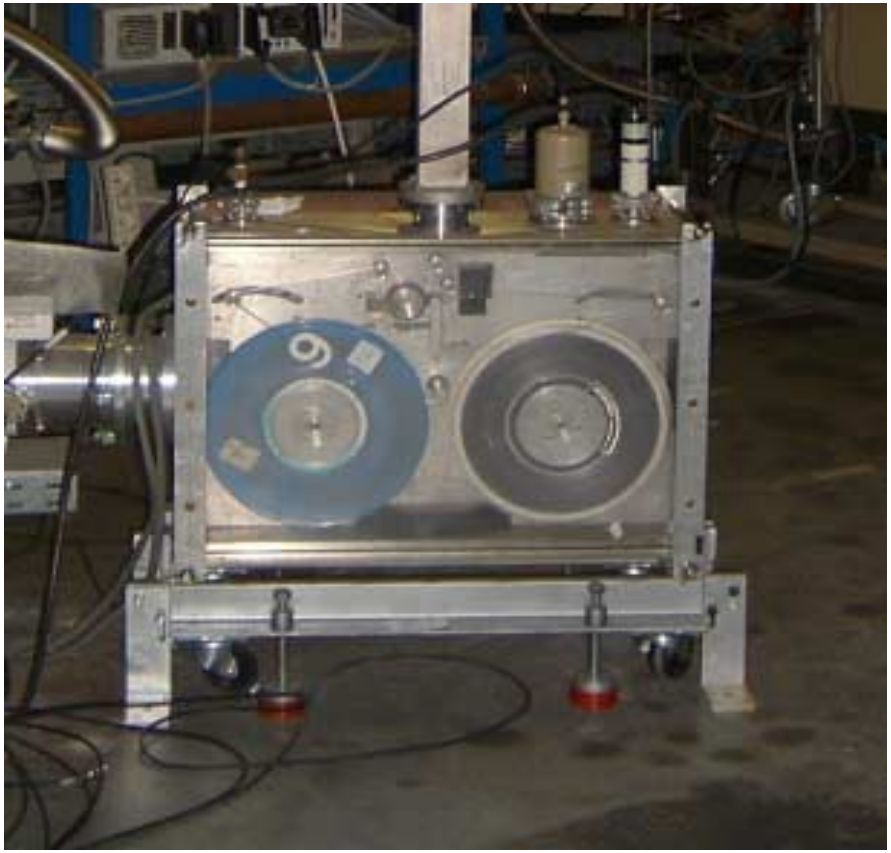


He 500mbar, legth 1m ~ 8 mg/cm^2



Purification system and tape station





Both systems to be provided by Leuven

Outlook

Currently and until summer 2003:

- Low energy performance tests of the gas cell at ANL
- Design and construction of the RFQ-Ion-Distribution system
- Final design, assembly and test of the pumping and purification system at GSI
- First tests and gradual implementation of a remote control system for the FRS-IC
- Implementing the components delivered from collaborators

Autum/winter 2003:

- Commissioning of all FRS-IC components
- First off-line tests with the complete setup by the end of 2003

First on-line test by 2004

Please visit our Website: http://www-wnt.gsi.de/s258/main.htm