

A Time-of-Flight Mass Spectrometer behind SHIP and FRS



FRS User Meeting May 7-9, 2001

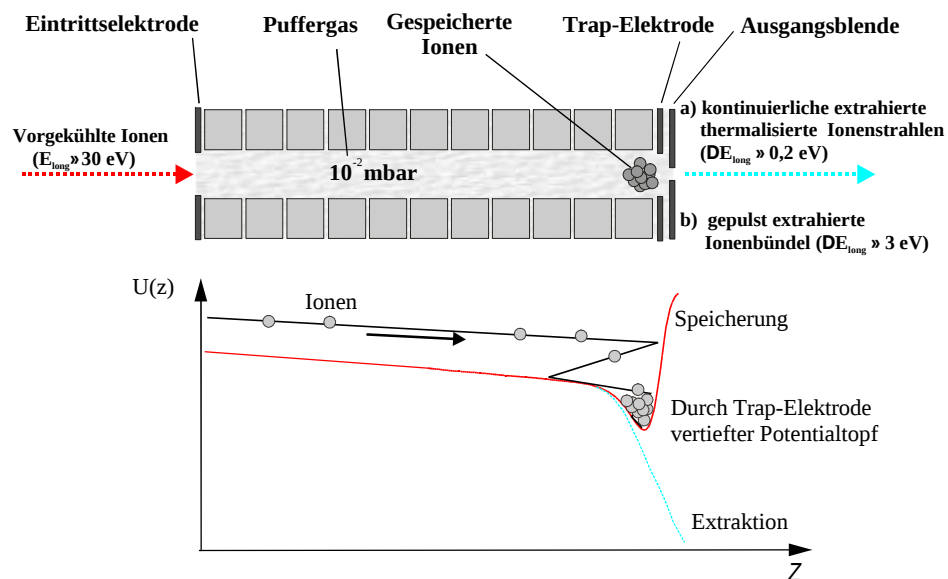
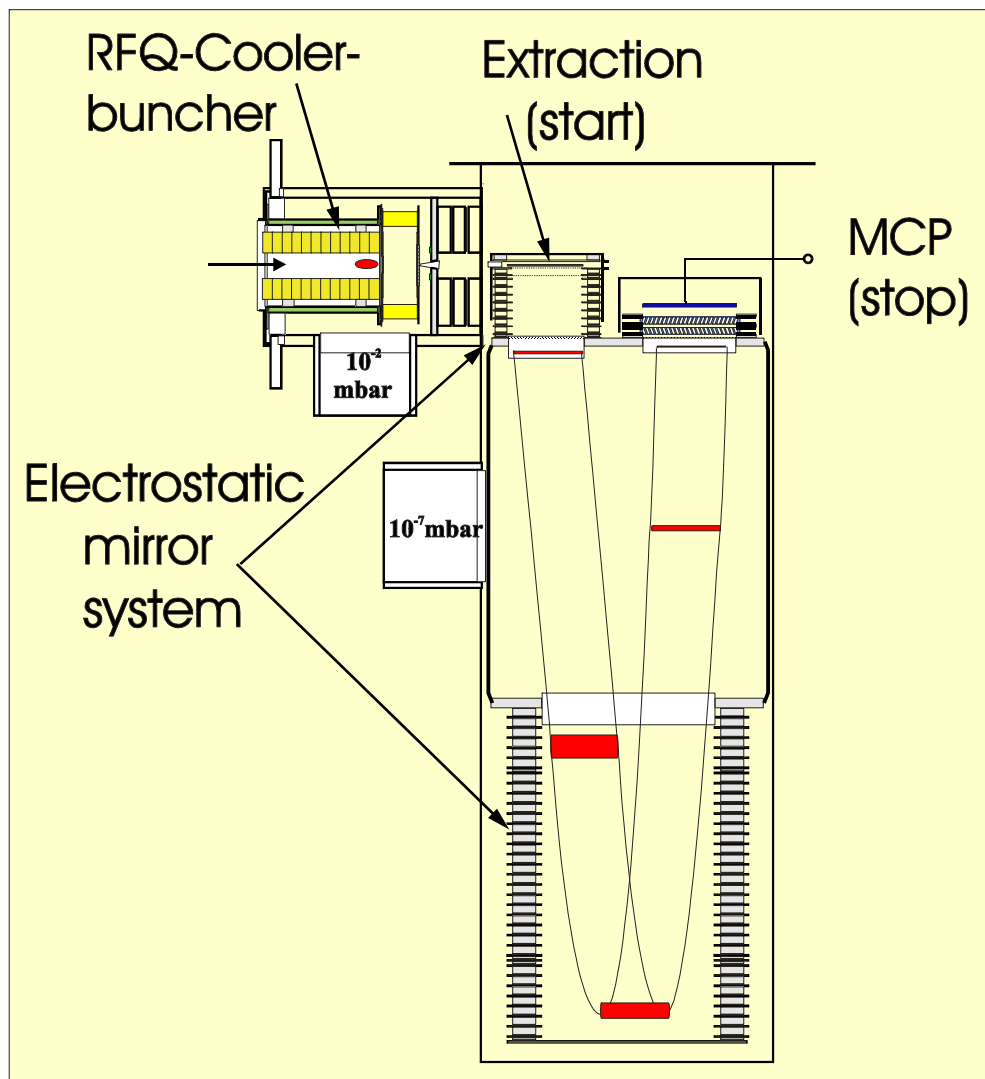
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Outline:

- * Motivation
- * Performance of the Electrostatic TOF Spectrometer
- * Planned setup at the SHIP for direct mass measurement
- * Planned setup at the FRS for diagnostic studies of FRS gas-cell setup
- * Conclusion

Electrostatic TOF Mass Spectrometer



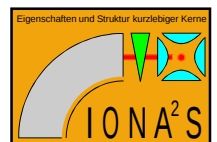
Electrostatic TOF Mass Spectrometer

Performance:

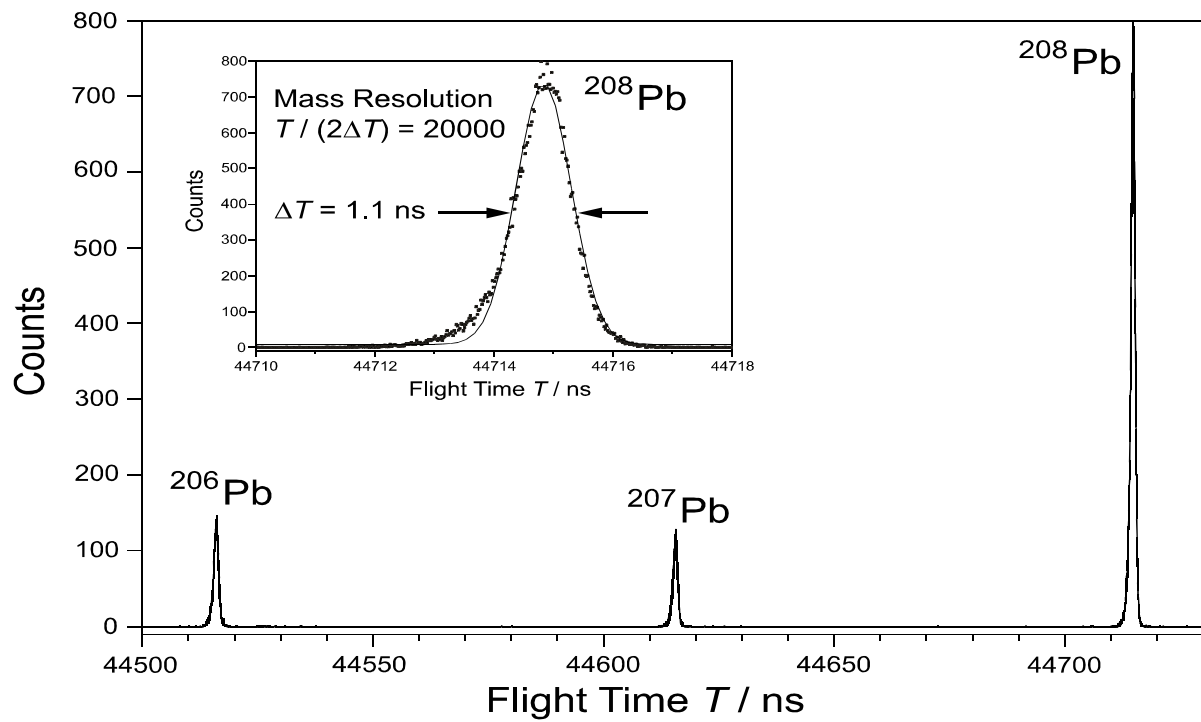
- * $R_{\text{mass}} = 20000$
- * Accuracy = $\sim 1\text{ppm}$
- * Transmission = $\sim 40\%$
- * Transmission time = $\sim 10\text{ms}$

Advantages:

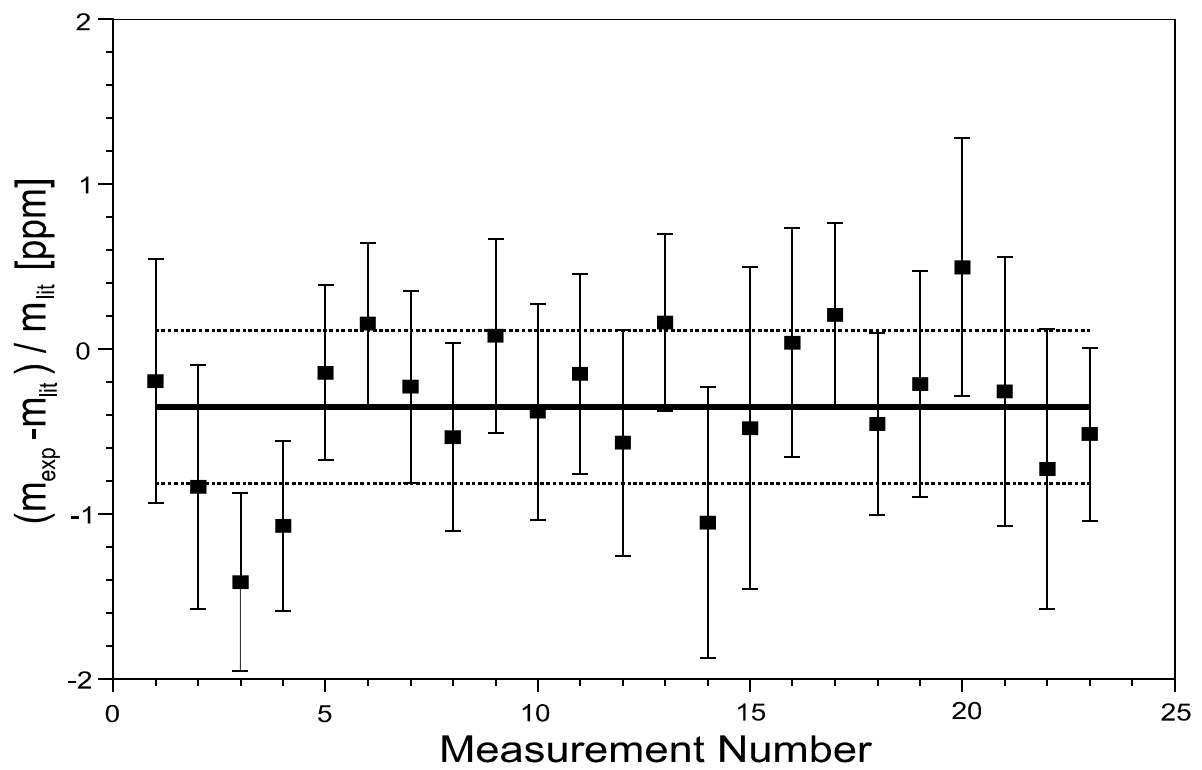
- * energy-isochronous
- * access to short-lived nuclei ($\text{TOF} < 1\text{ms}$)
- * compact
- * coupled to gas cell/RFQ systems



Mass Resolving Power

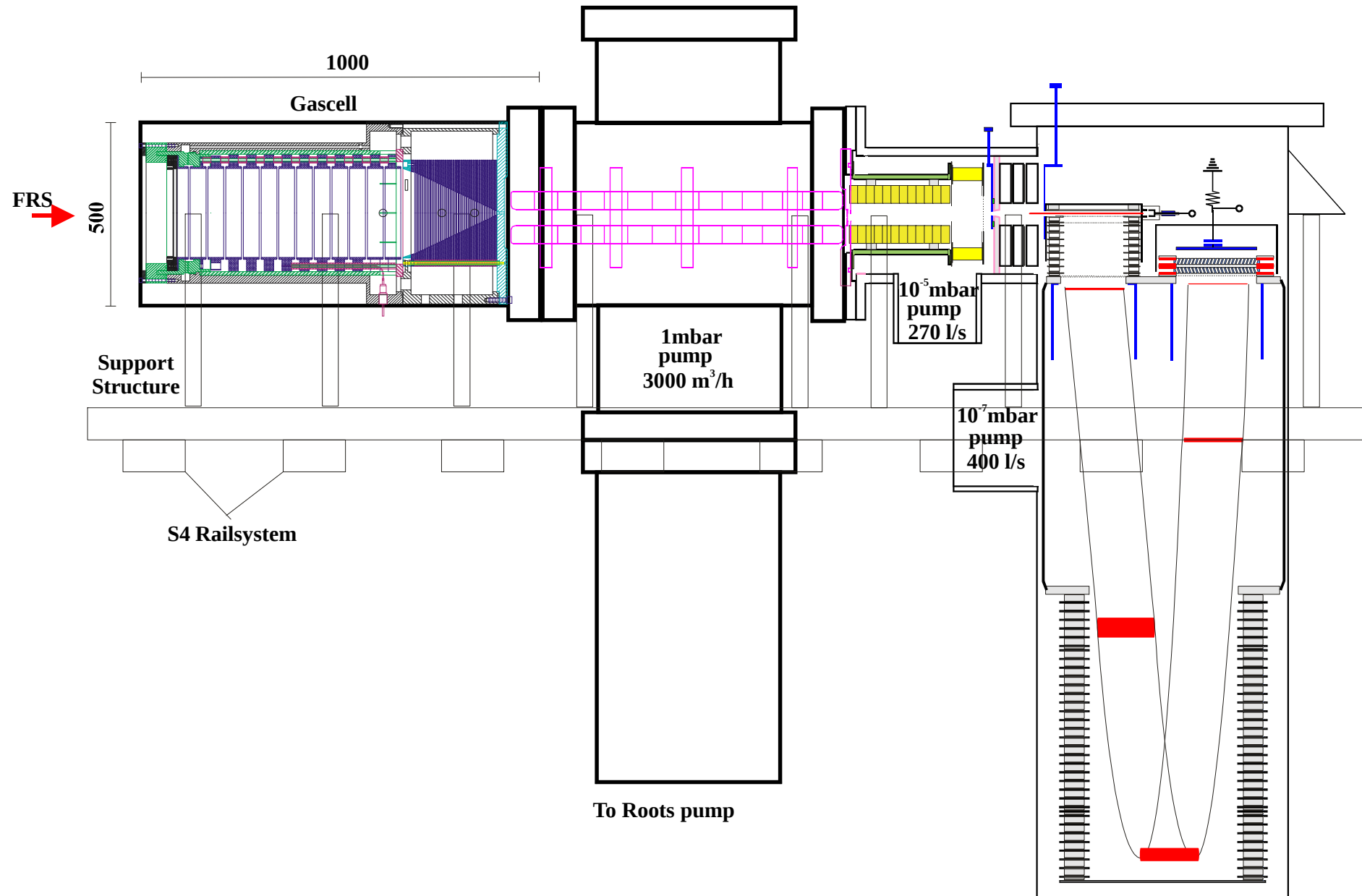


Accuracy test



Gascell setup at the FRS (S4)

(Sideview)



Summary and outlook

- * Electrostatic time-of-flight mass spectrometer
- * Plans for direct mass measurements at SHIPTRAP
- * Diagnostic tool for performance studies at the FRS gas-cell setup

Next steps:

- * Coupling to SHIPTRAP
- * Improve cooler and mass resolving power
- * Efficiency measurements

Future plans:

- * Developing a new TOF with resolving power between 50000 and 100000.