Mass measurements of neutron-rich nuclei with the storage ring ESR at GSI

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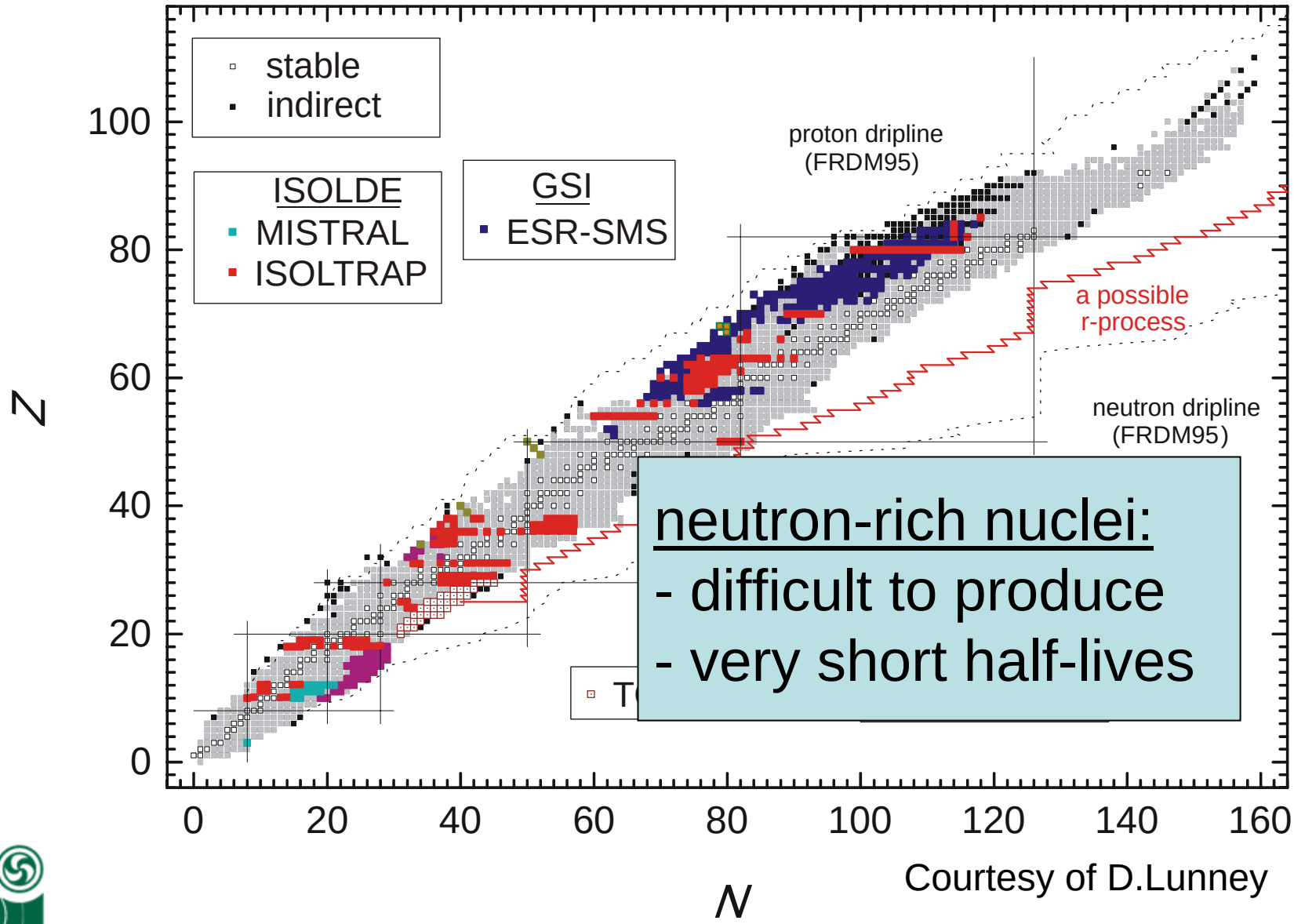
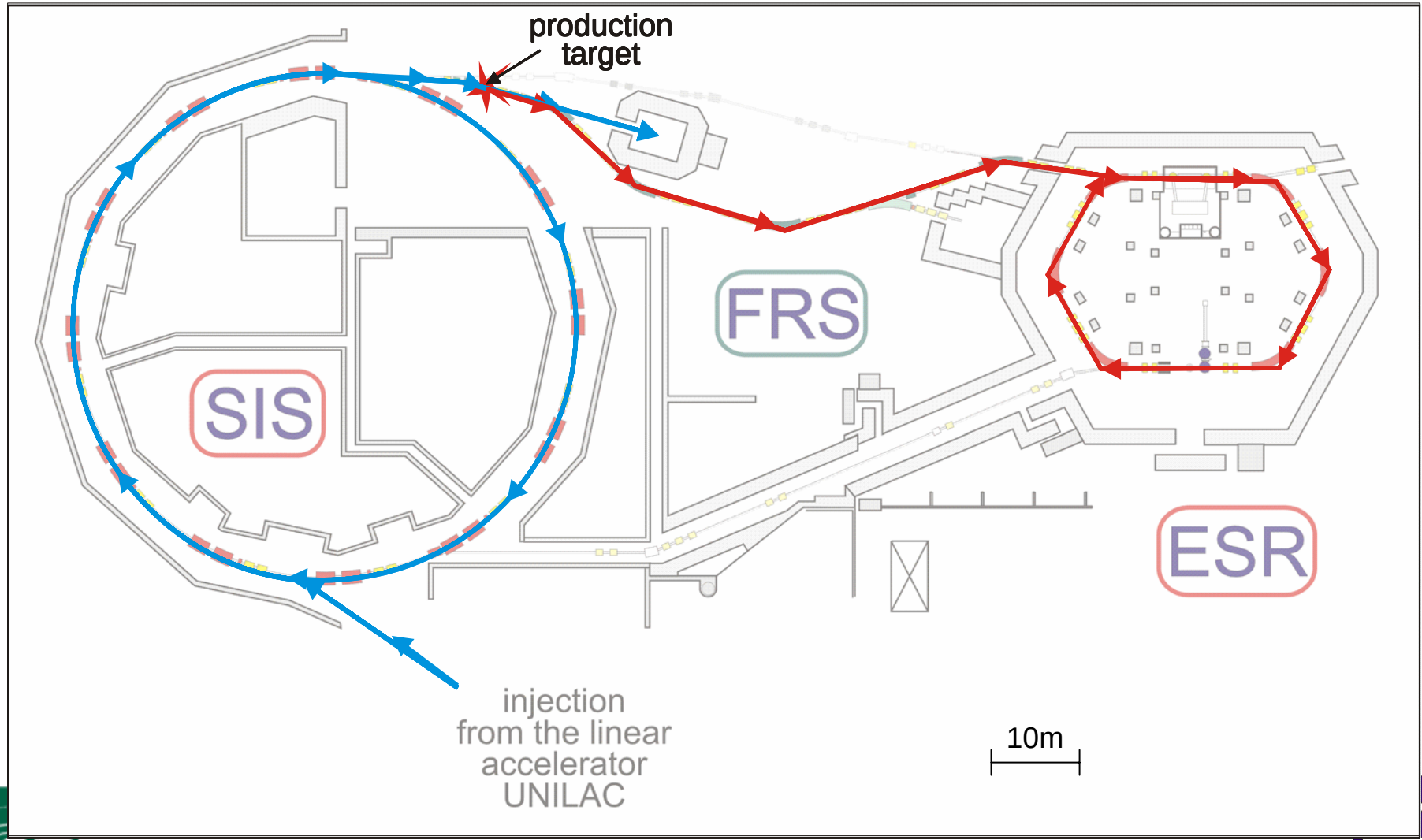
NSCL, MSU & JINA

More than 5 years ago

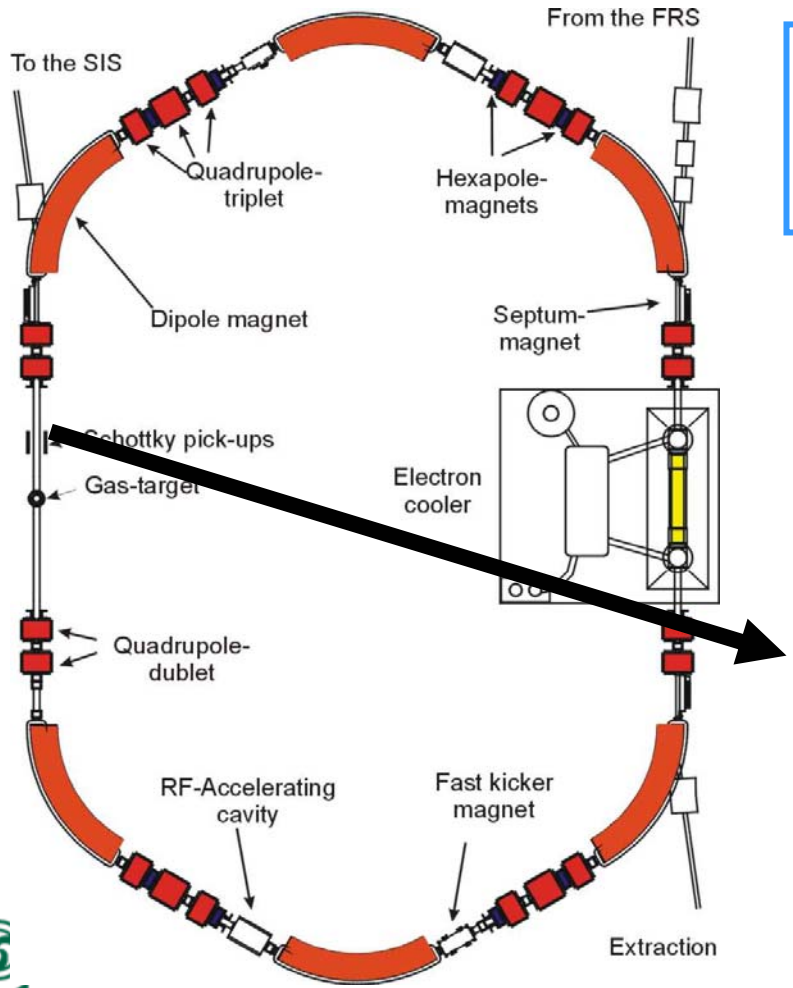


Courtesy of D.Lunney

Mass Measurements at the GSI Storage Ring - ESR

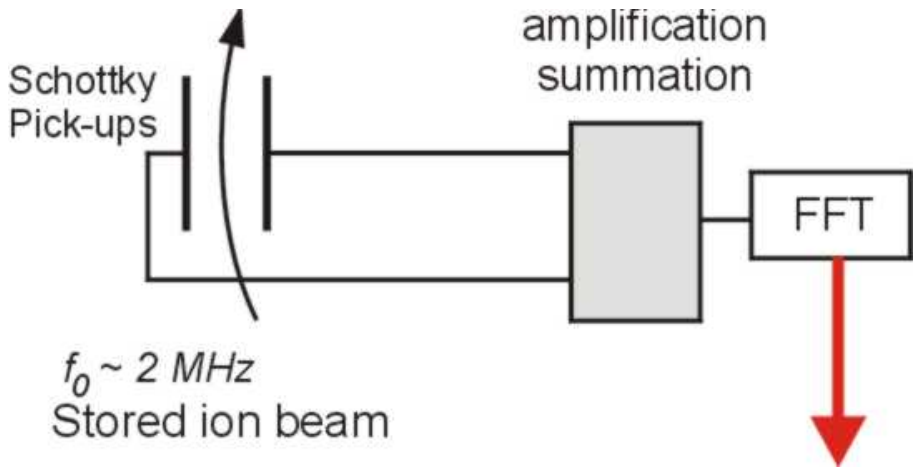


Schottky Mass Spectrometry (SMS)



$$\frac{\Delta f}{f} = -\frac{1}{\gamma_t^2}\frac{\Delta(m/q)}{m/q} + \frac{\Delta v}{v}\left(1 - \frac{\gamma^2}{\gamma_t^2}\right)$$

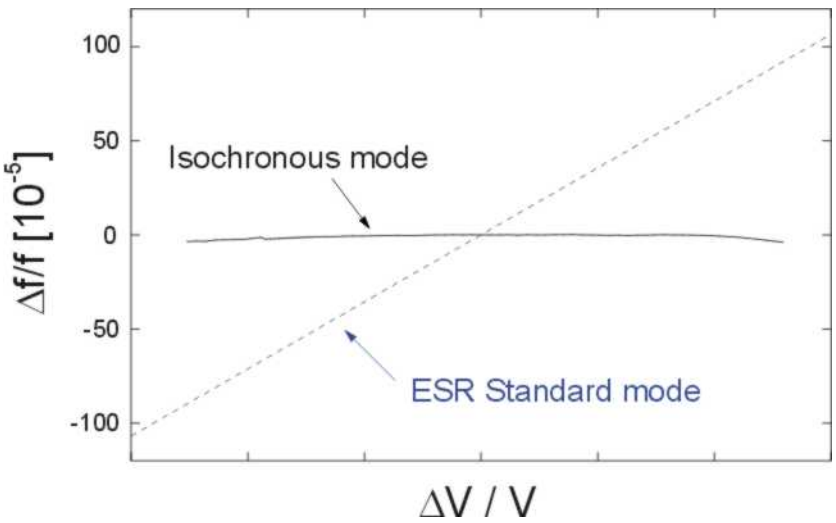
$$\frac{\Delta v}{v} \to 0$$



Mass Spectrometry of Individual Ions (MSI^2)

Isochronous Mass Spectrometry (IMS)

$$\frac{\Delta t}{t} = -\frac{\Delta f}{f} = \gamma_t^{-2}\frac{\Delta(m/q)}{m/q} + \left(\frac{\gamma^2}{\gamma_t^2} - 1\right)\frac{\Delta v}{v}$$

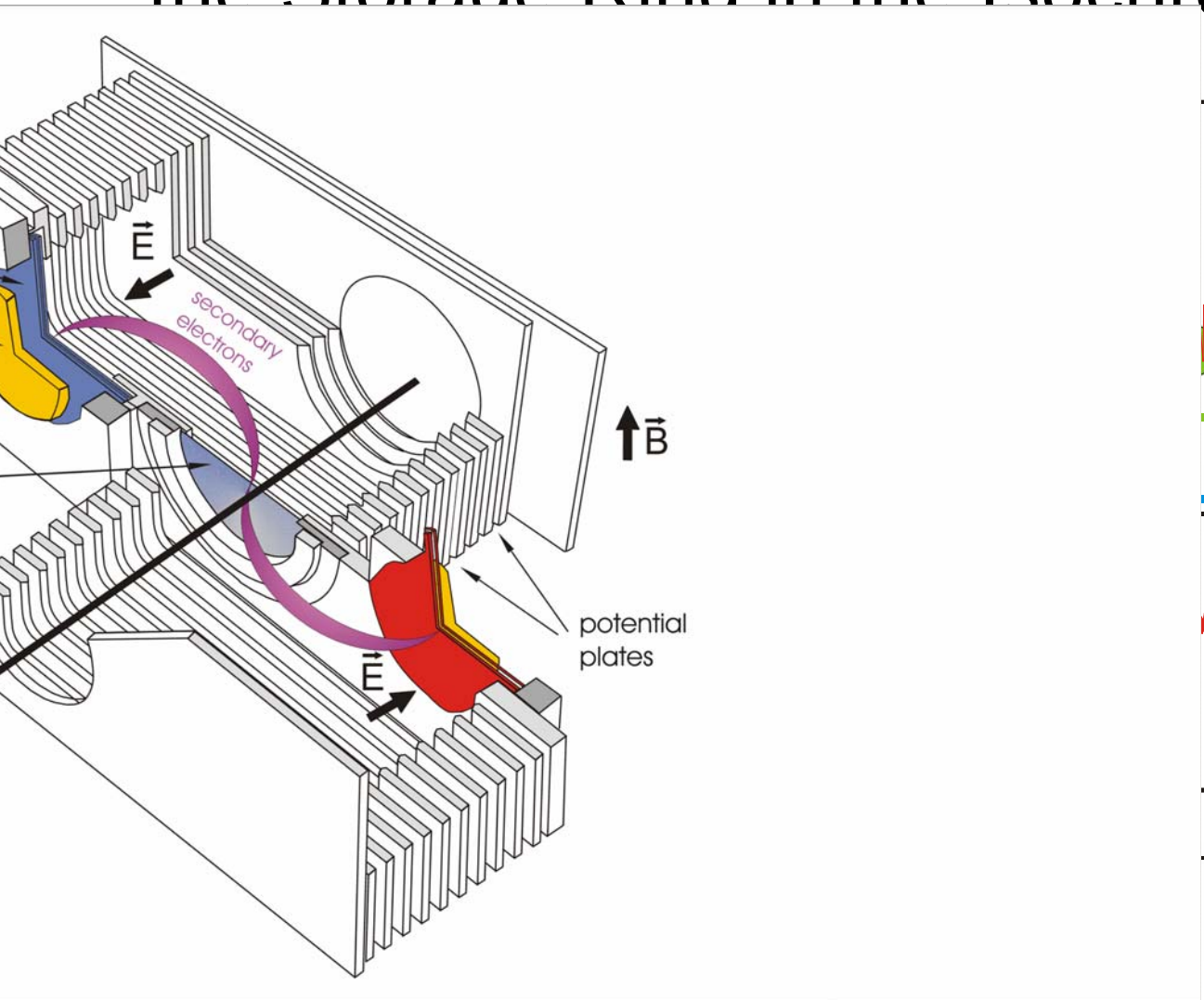


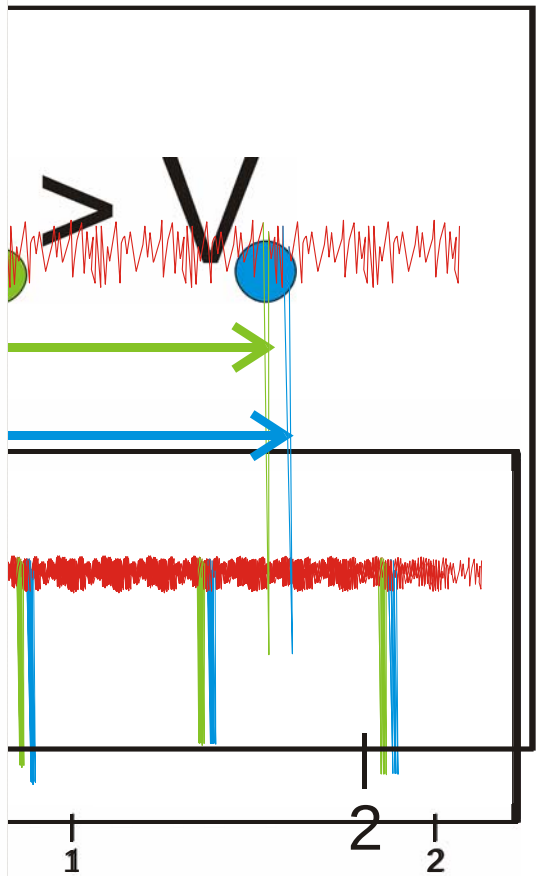
$\gamma_t \rightarrow \gamma$

γ - Lorentz factor

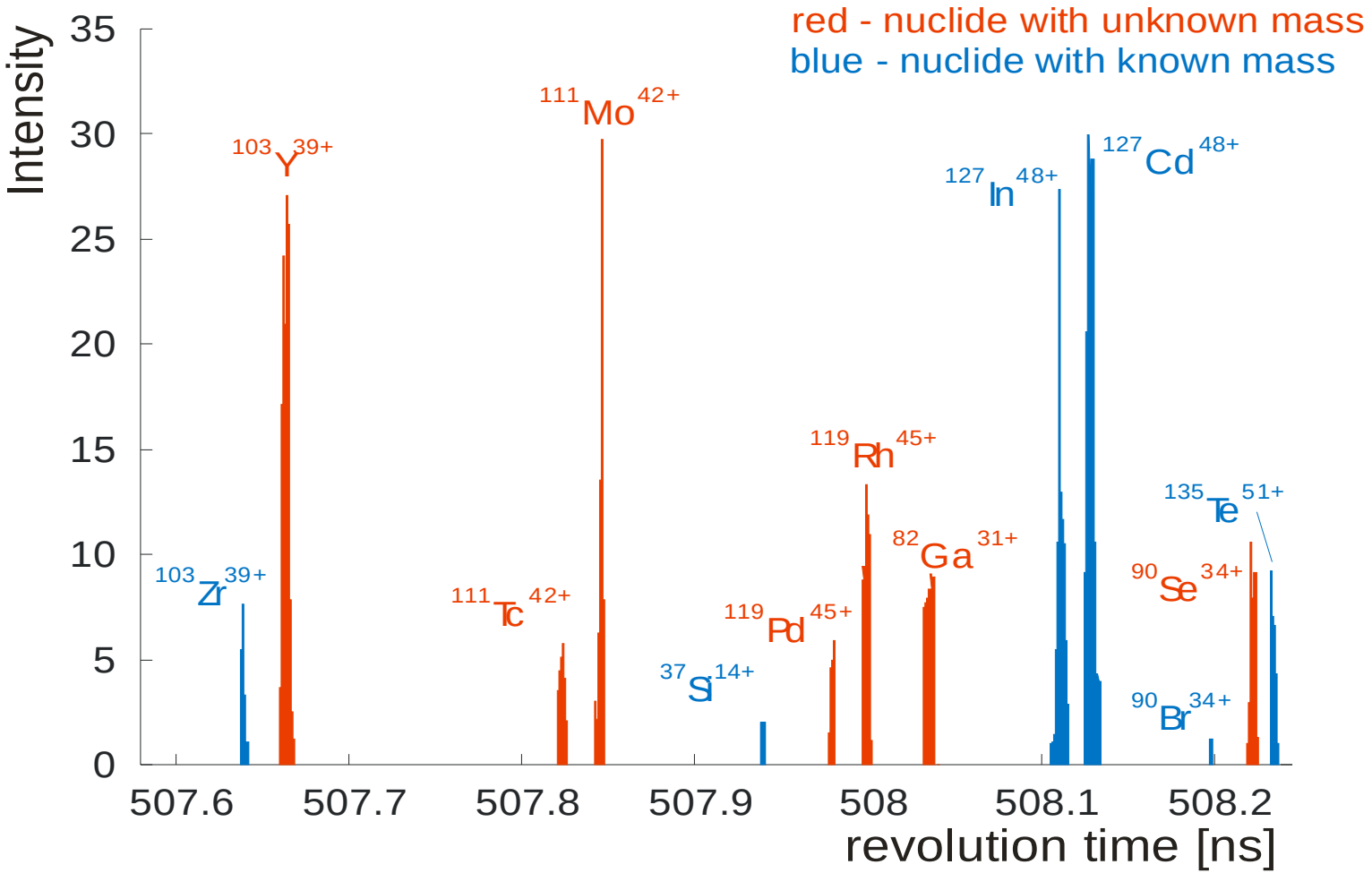
γ_t - transition point

Time-of-Flight Measurement with the Storage Ring in the Isochronous Mode

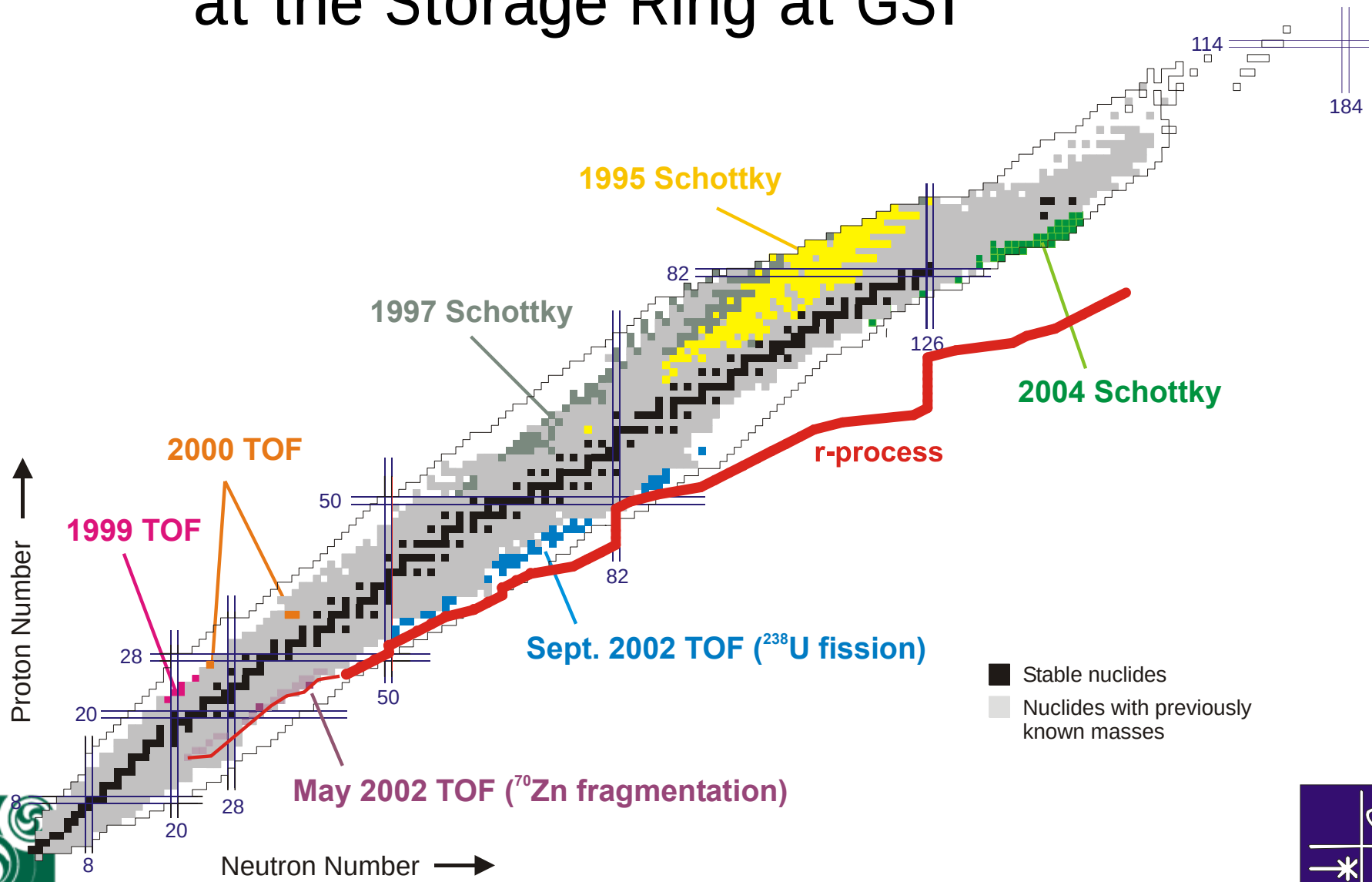




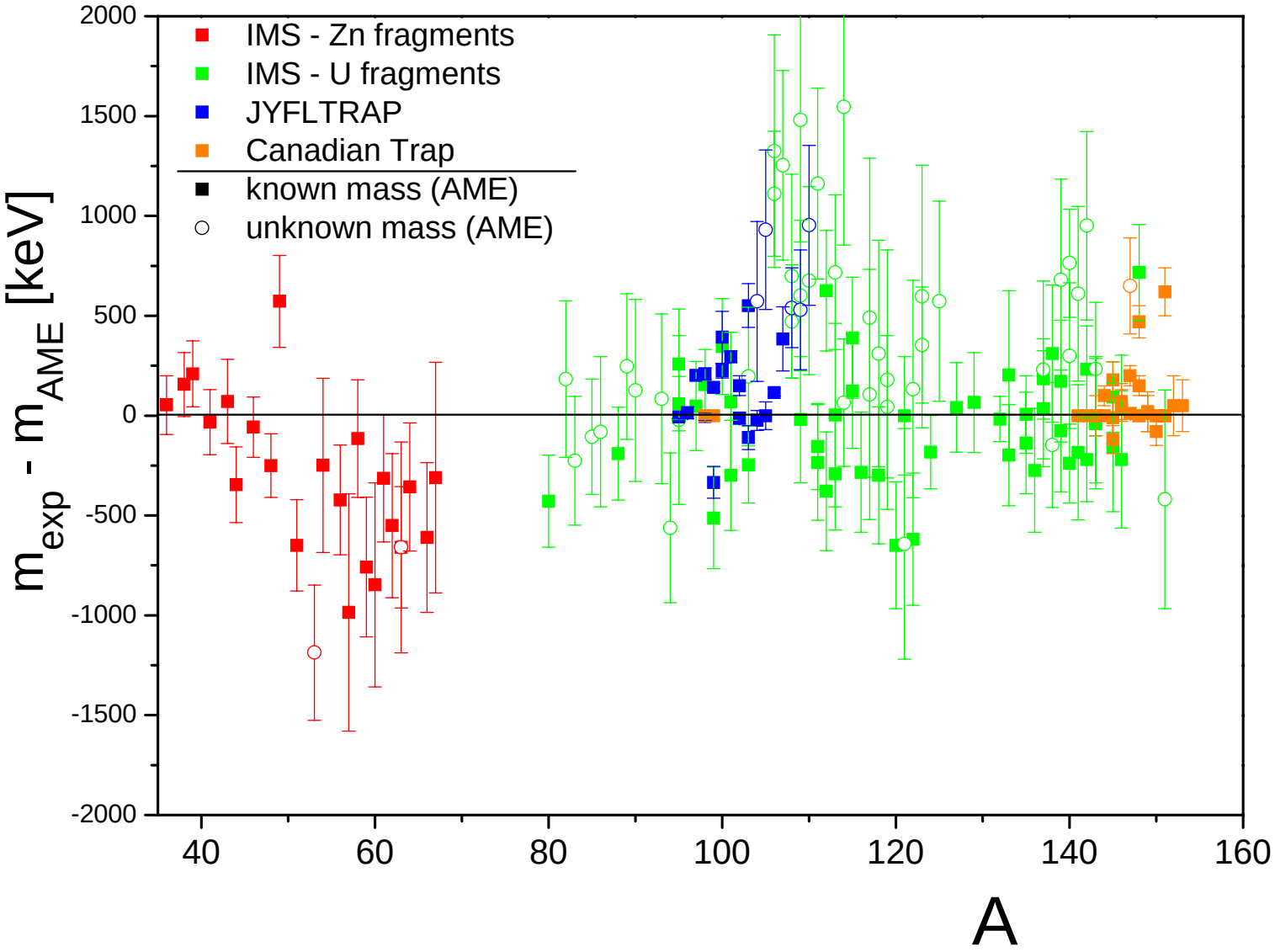
Time-of-Flight Spectrum



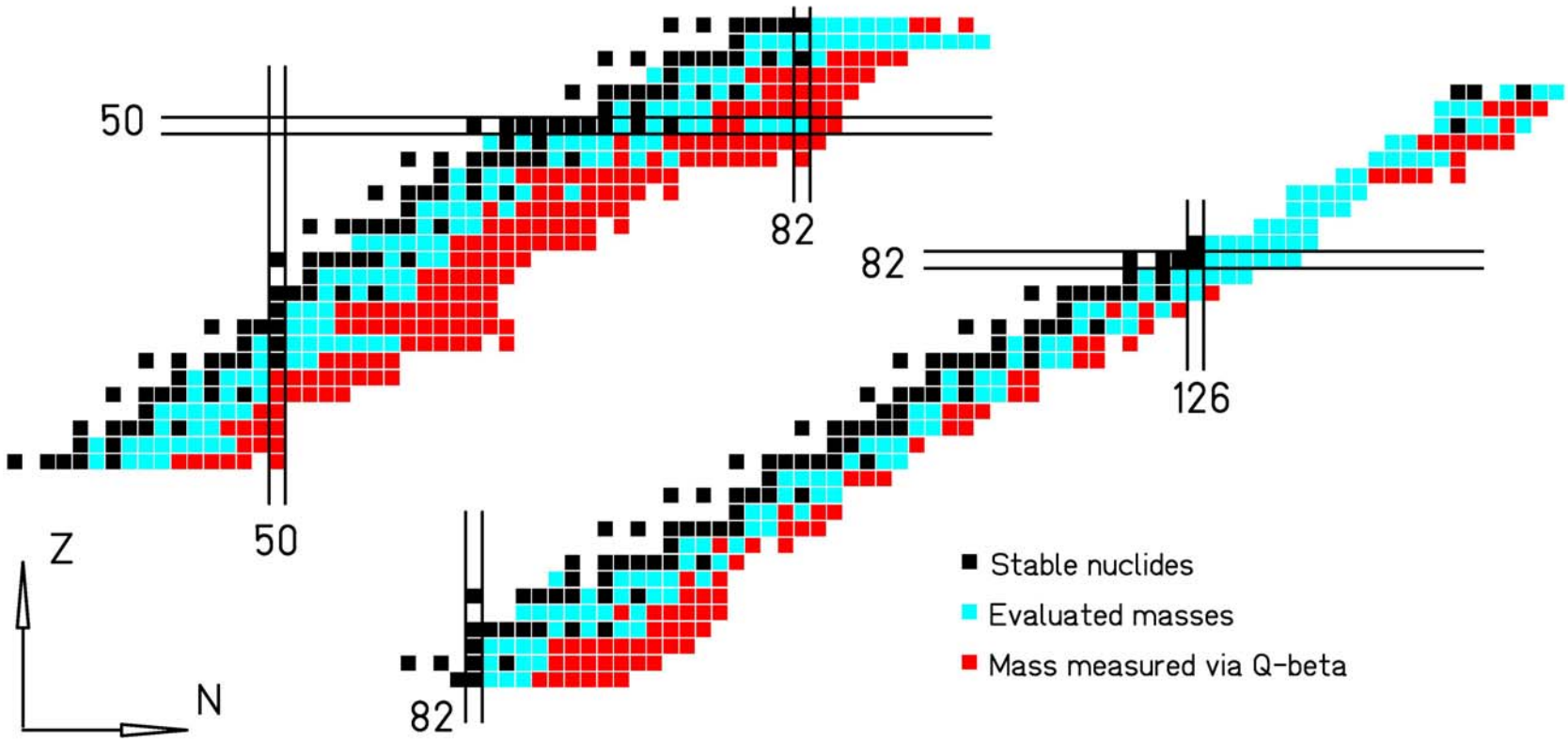
New Masses Measured at the Storage Ring at GSI



Comparison of several recent measurements with AME-2003

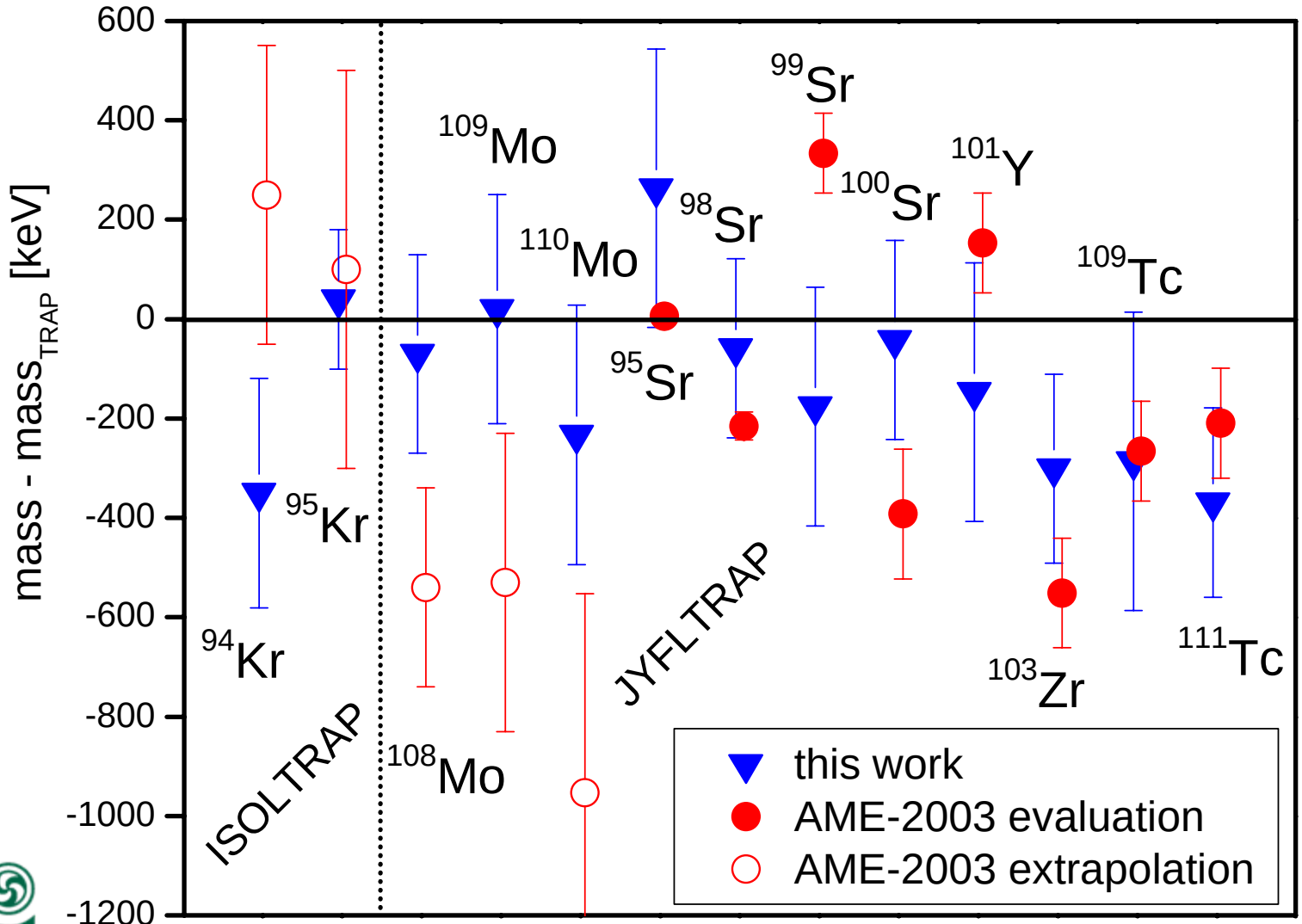


Mass surface determined by β-spectrometry (red squares)

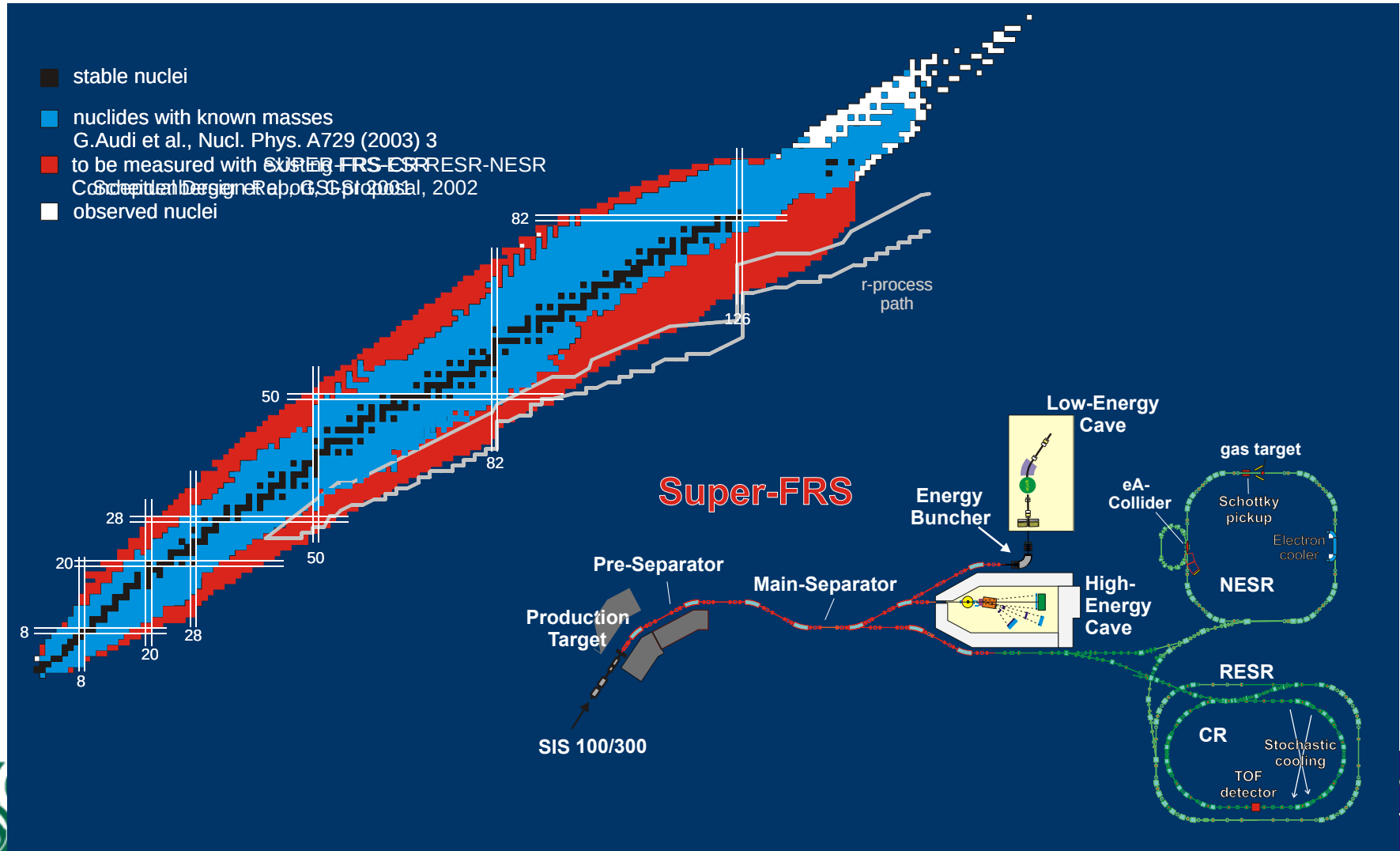


Courtecy of G. Vorobjev

Comparison with Penning trap results released after we finished our analyses



FAIR at GSI - ILIMA Proposal



Thanks:

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