Search for heavy neutron-rich isotopes

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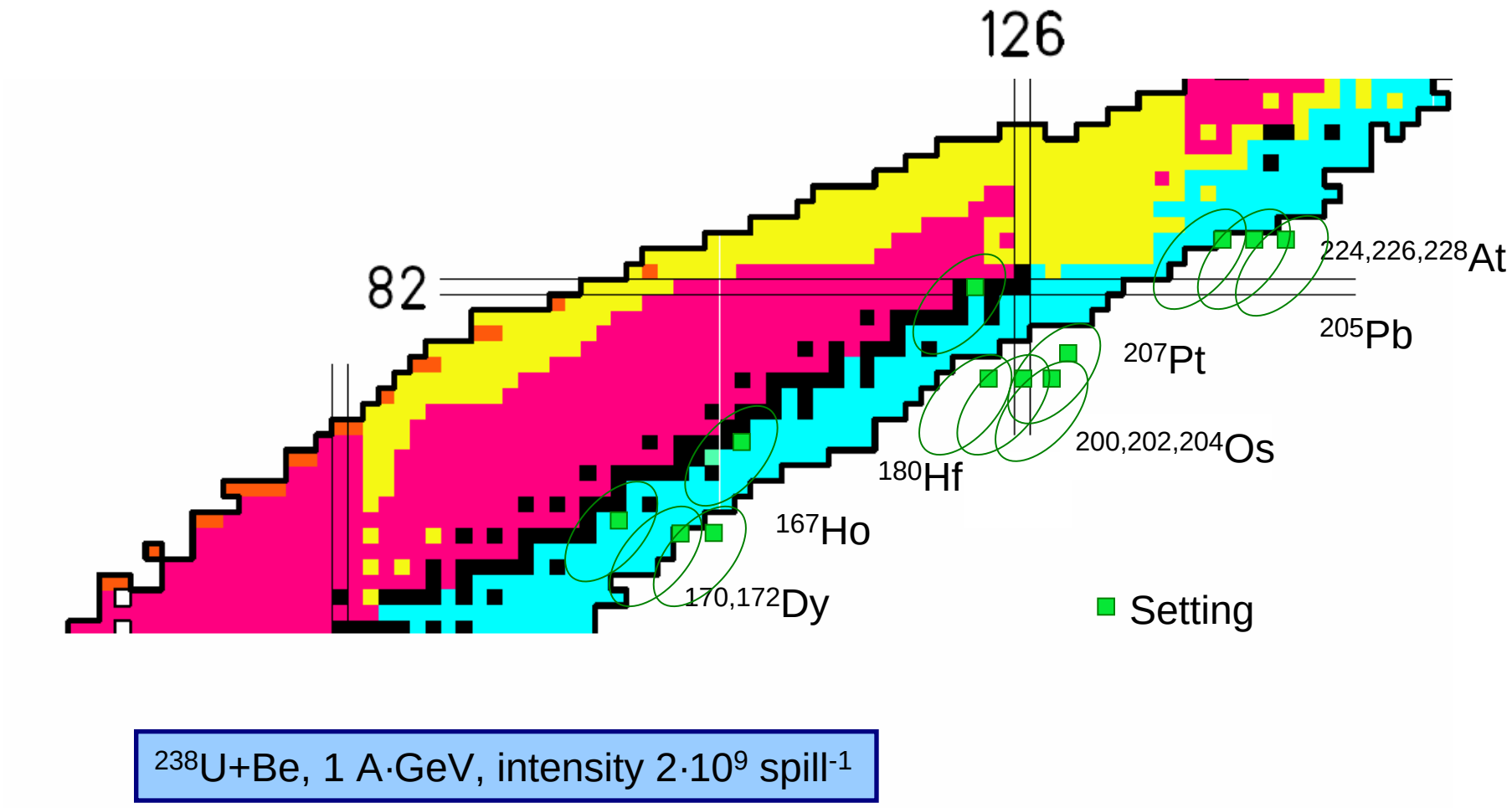
For the S392 collaboration

FRS User Meeting
08.11.2010

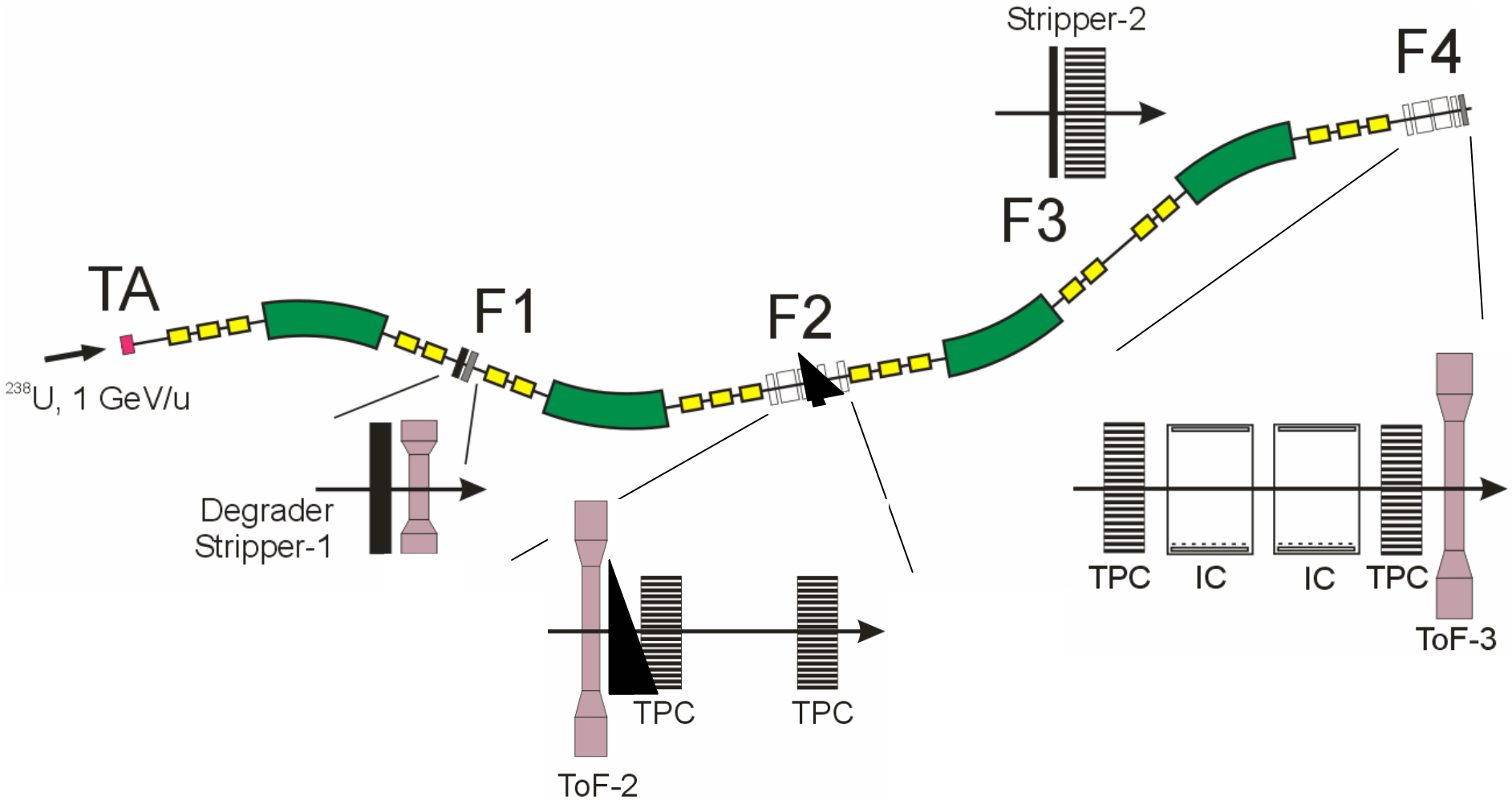
FRS settings



^{238}U+Be, 1 A·GeV, intensity 2·10^{9} spill^{-1}

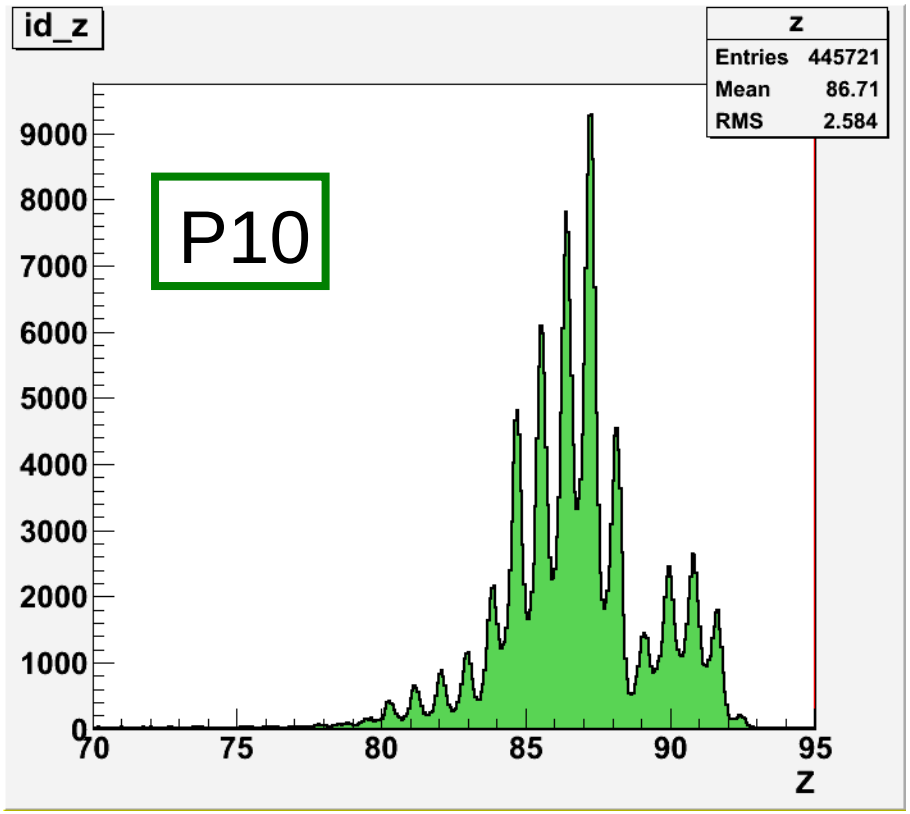
S392 Experimental Setup

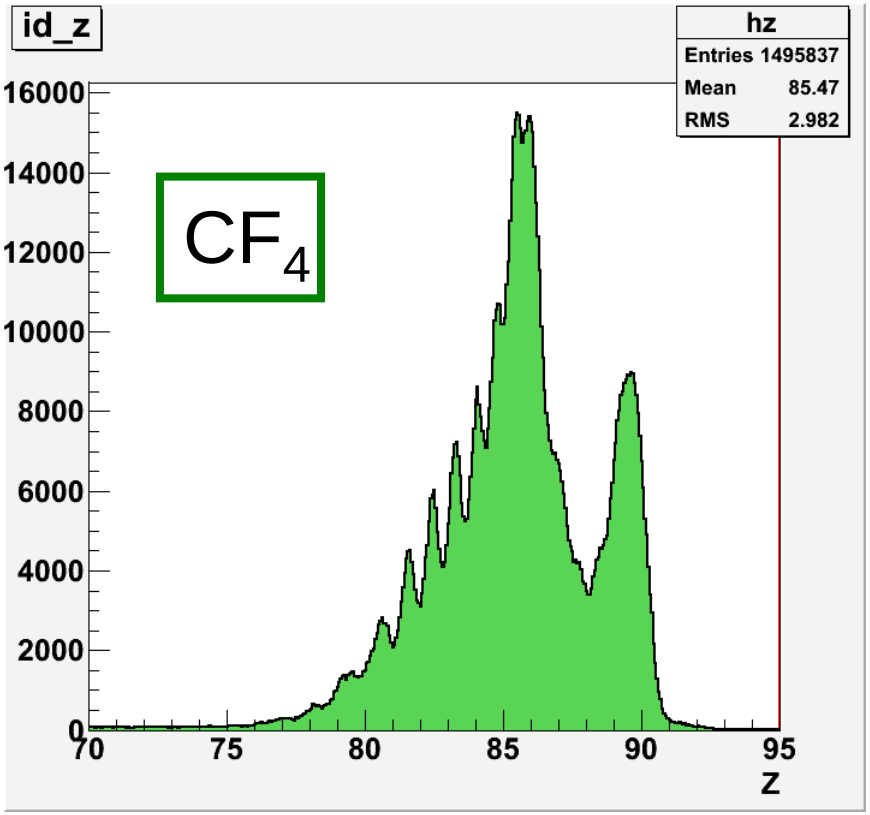
Separation: Bρ-ΔE-Bρ, identification: ΔE(IC), ToF, Bρ



MUSIC energy resolution

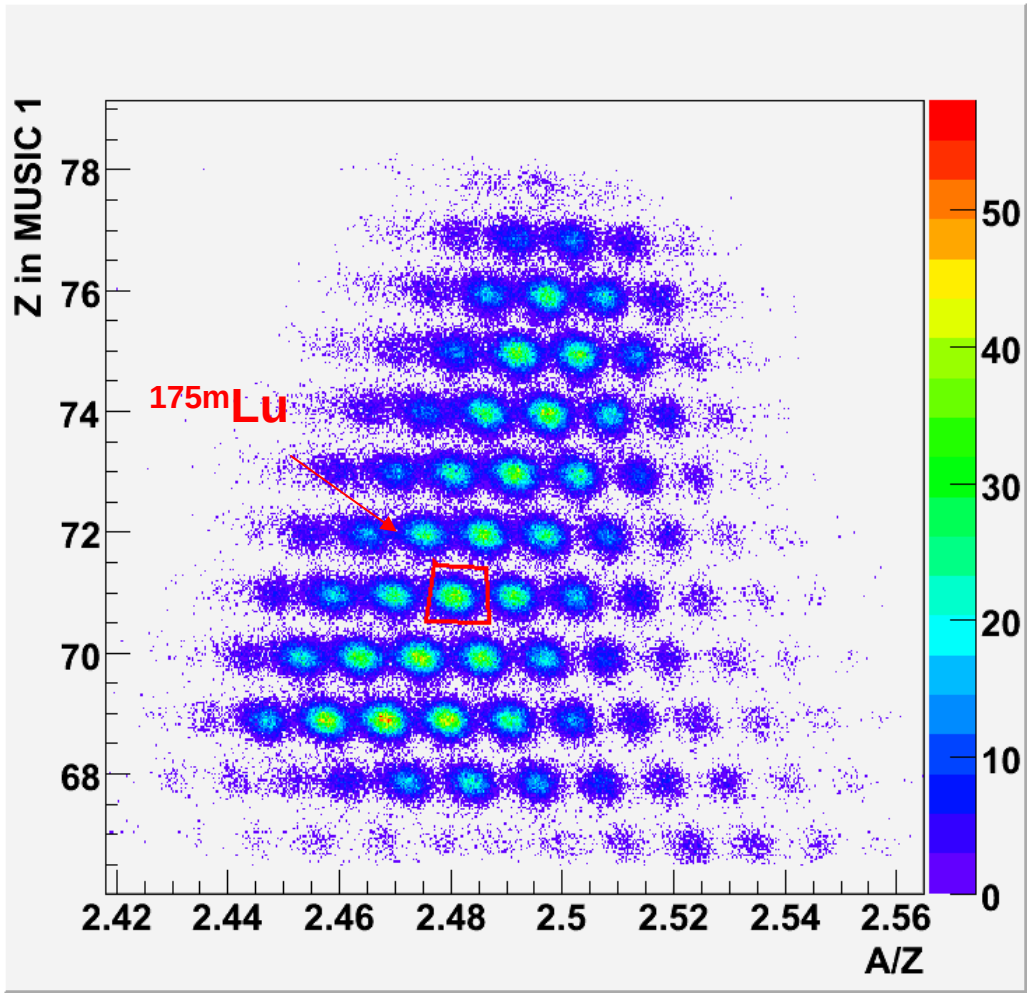
Comparison of MUSIC dE for ^{205}Pb setting

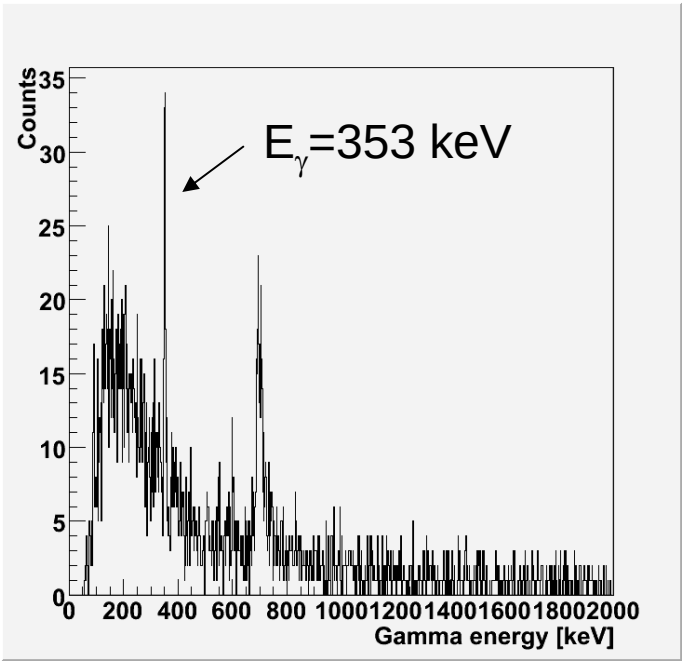


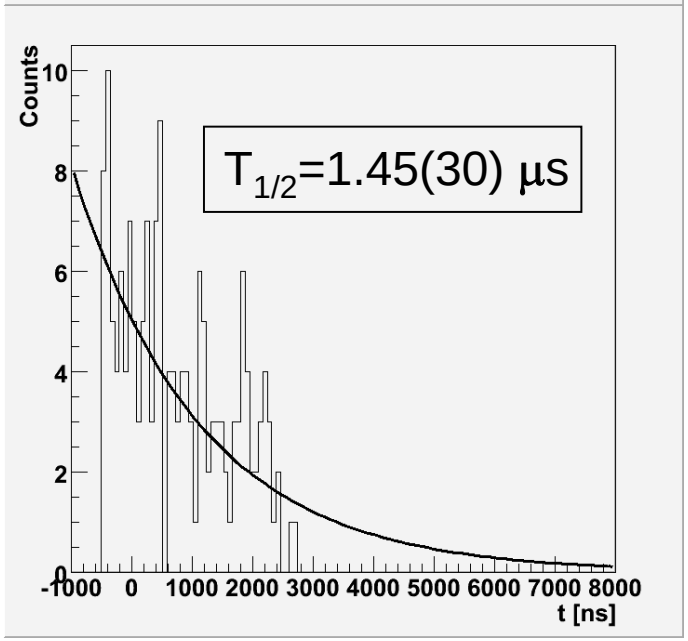


For the heaviest species σ_E decreases by a factor of 0.6

Isomer tagging technique



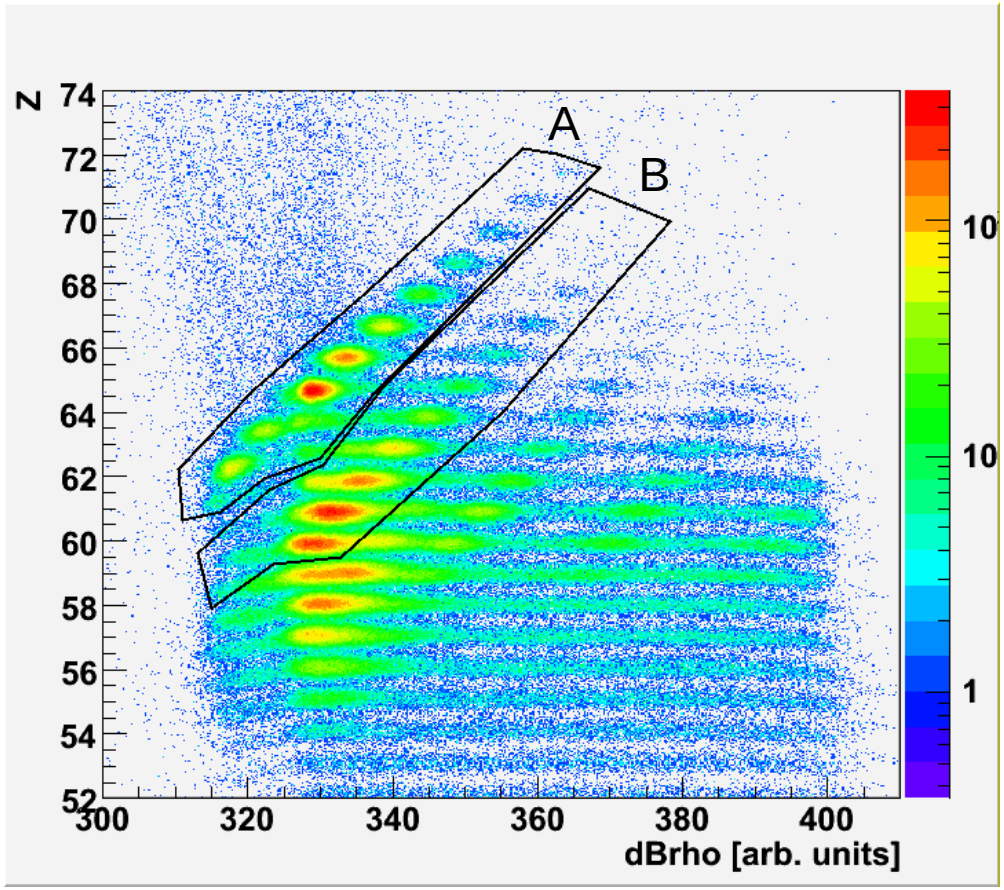


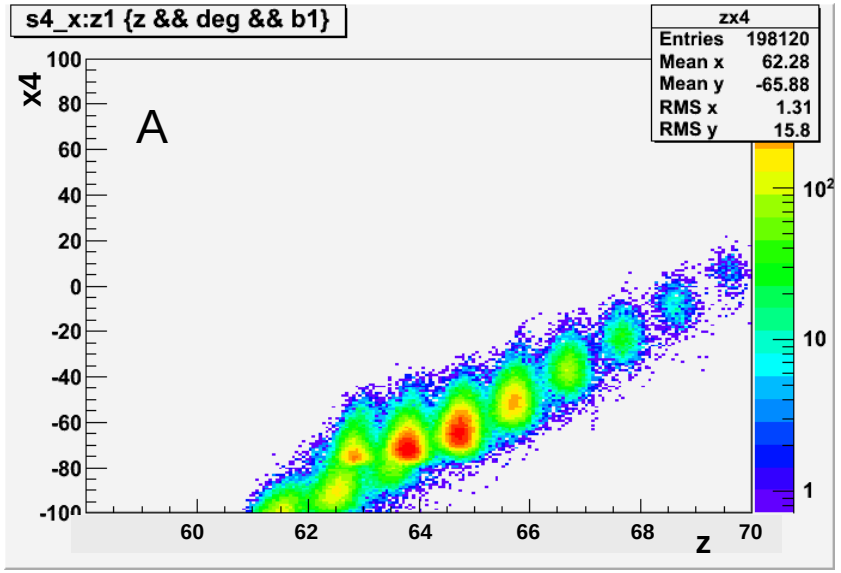


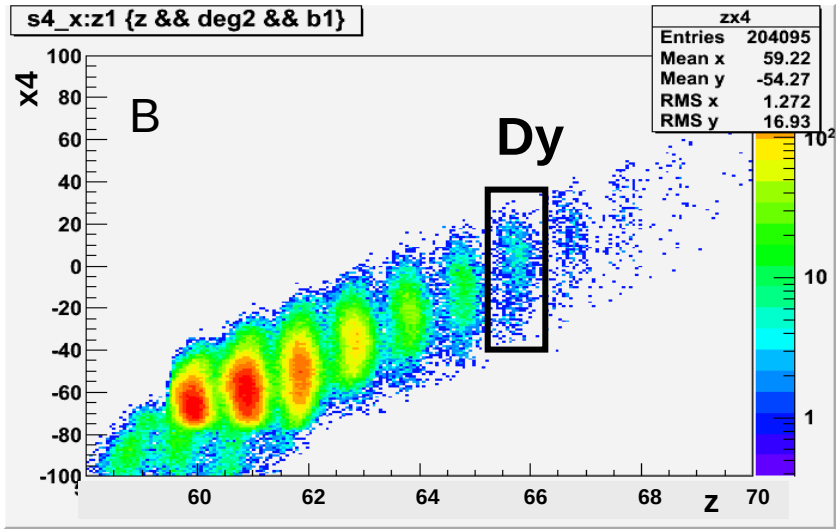
^{175m}Lu: E_γ=353.3 keV ($5/2^- \rightarrow 7/2^+$), $T_{1/2}$=1.49(7) μs

P.E. Garrett et al. PRC69 (2004) 017302
K.H. Johansen et al, Nucl. Phys. A133 (1969) 213

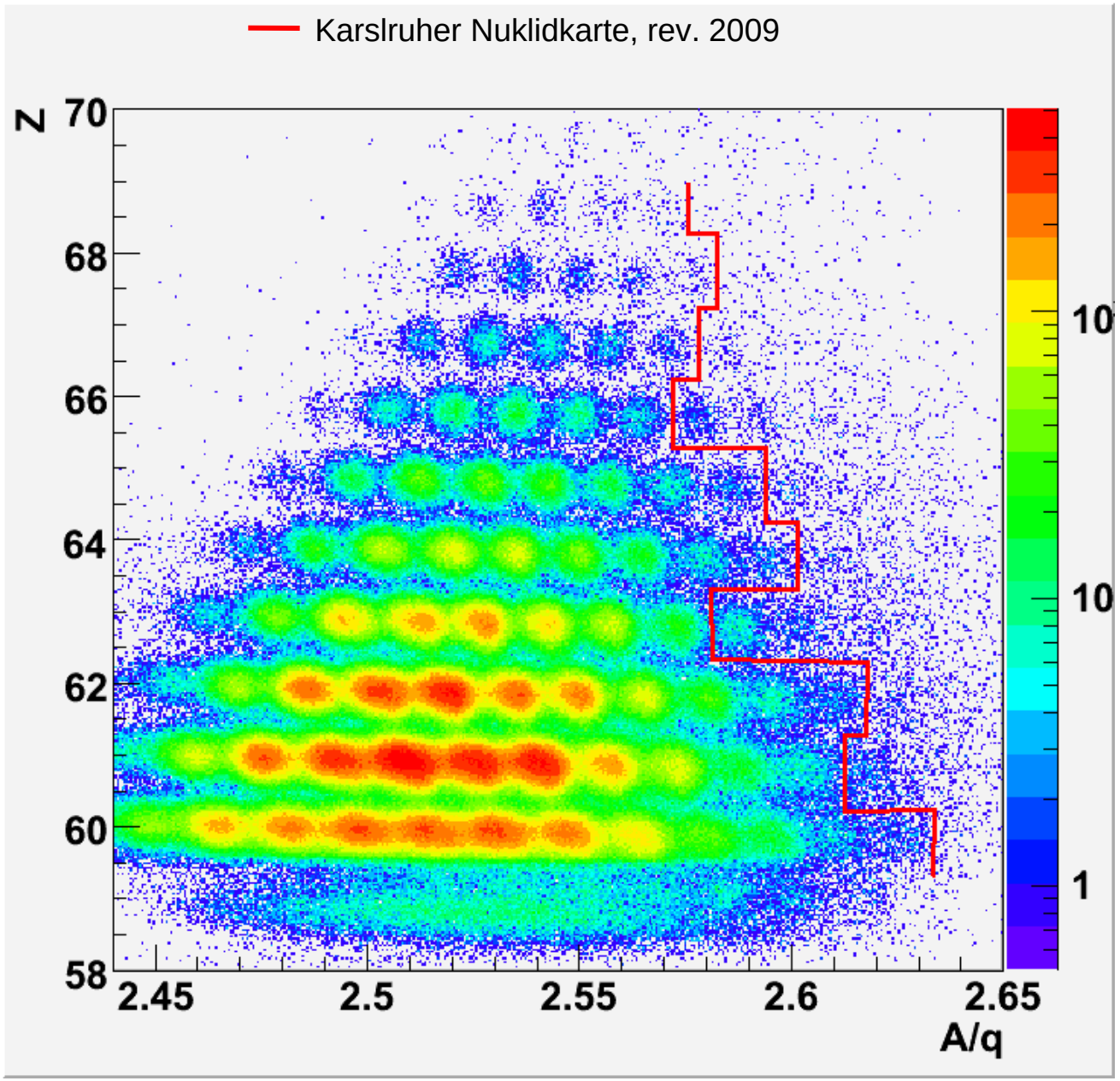
^{172}Dy setting



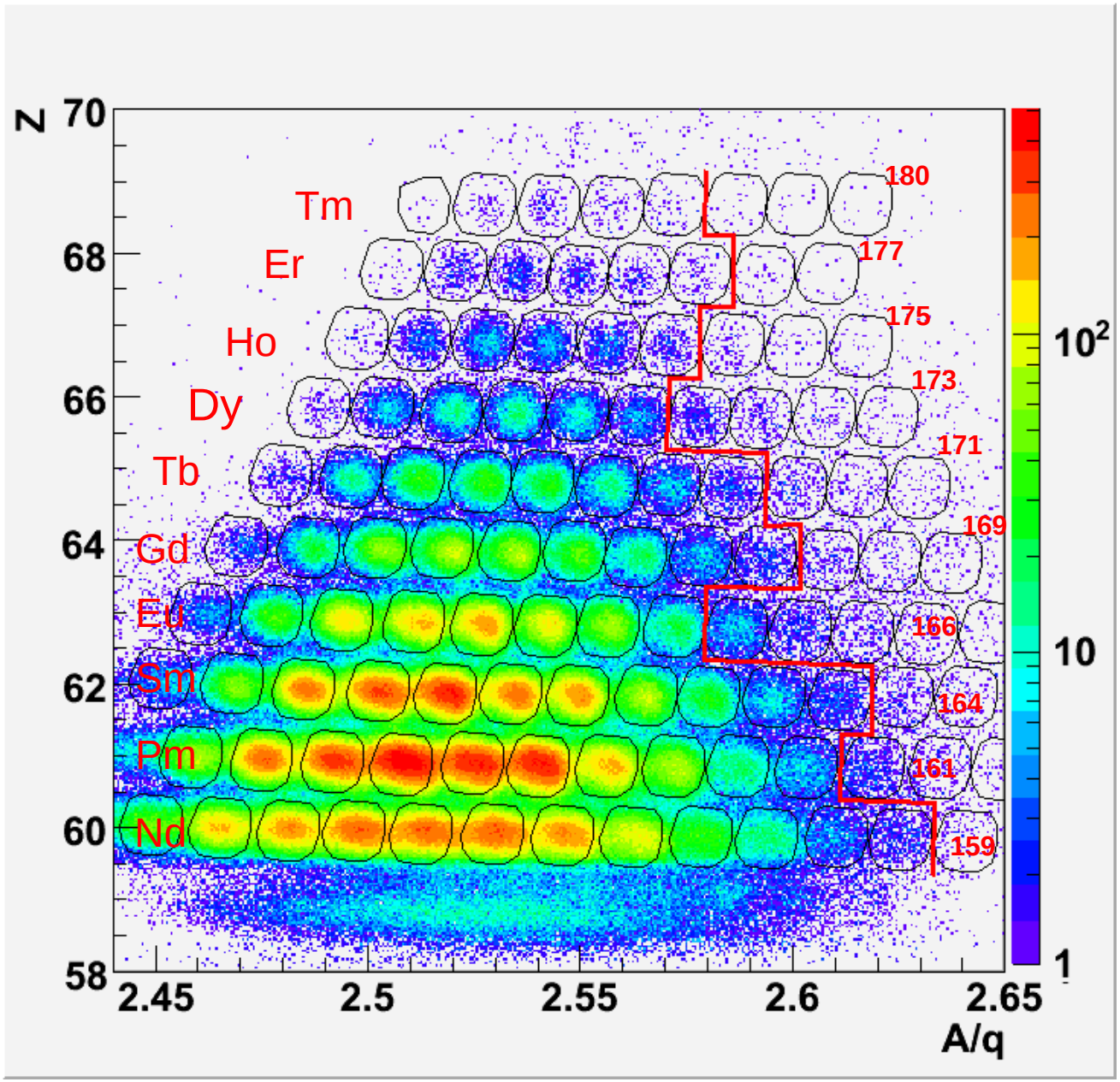




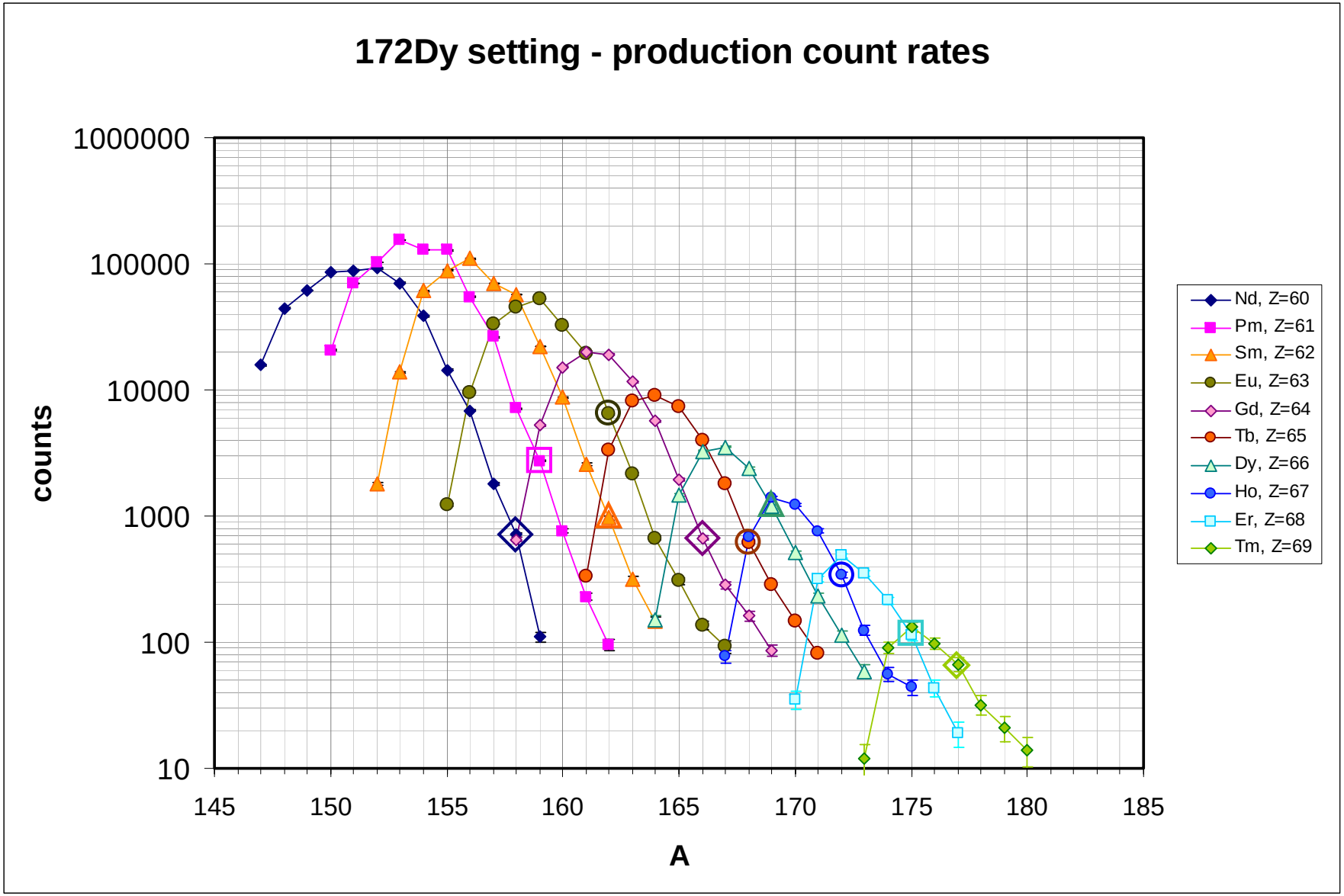
^{172}Dy setting



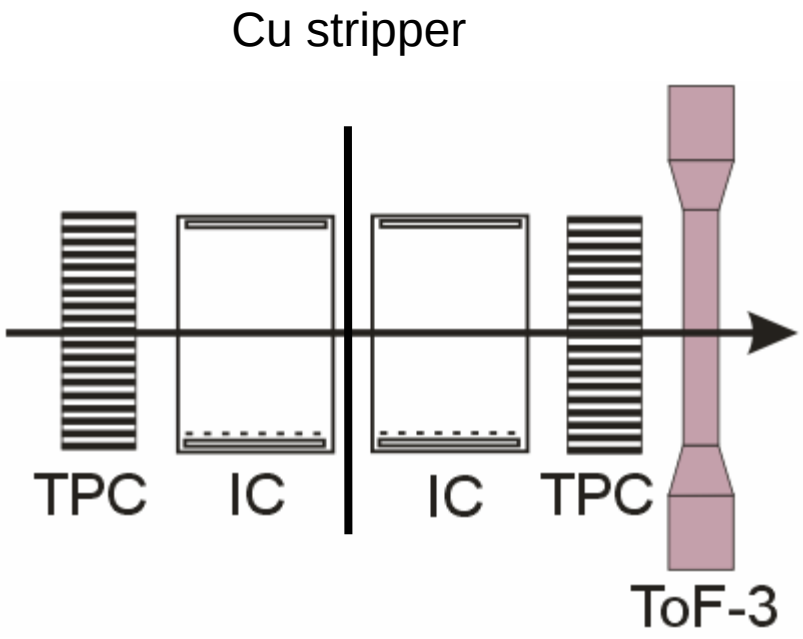
^{172}Dy setting

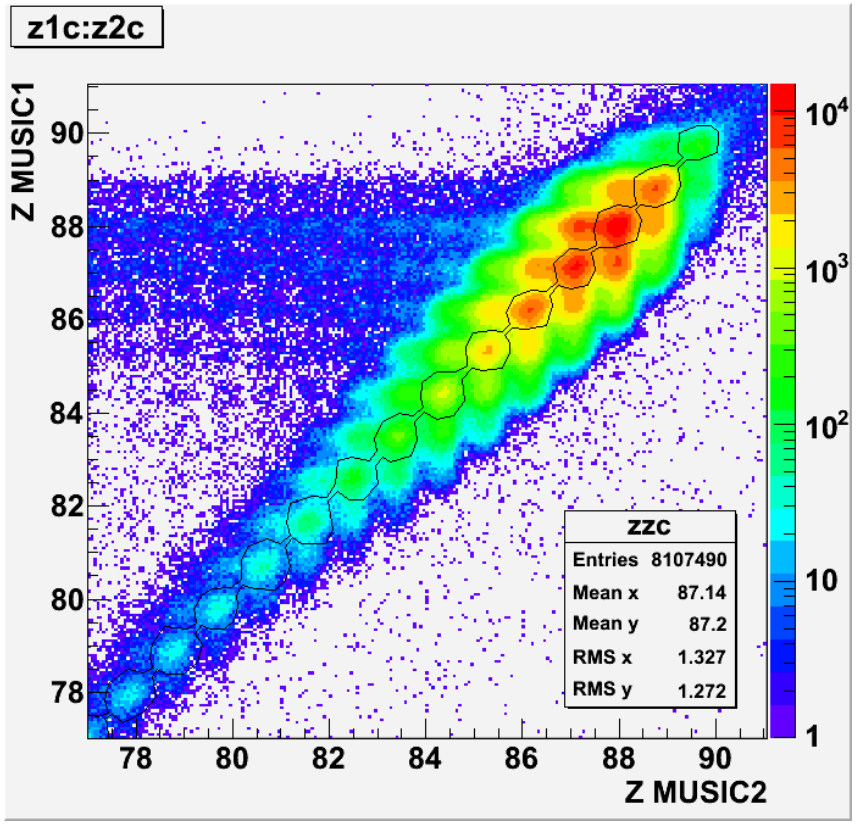


^{172}Dy - production count rates



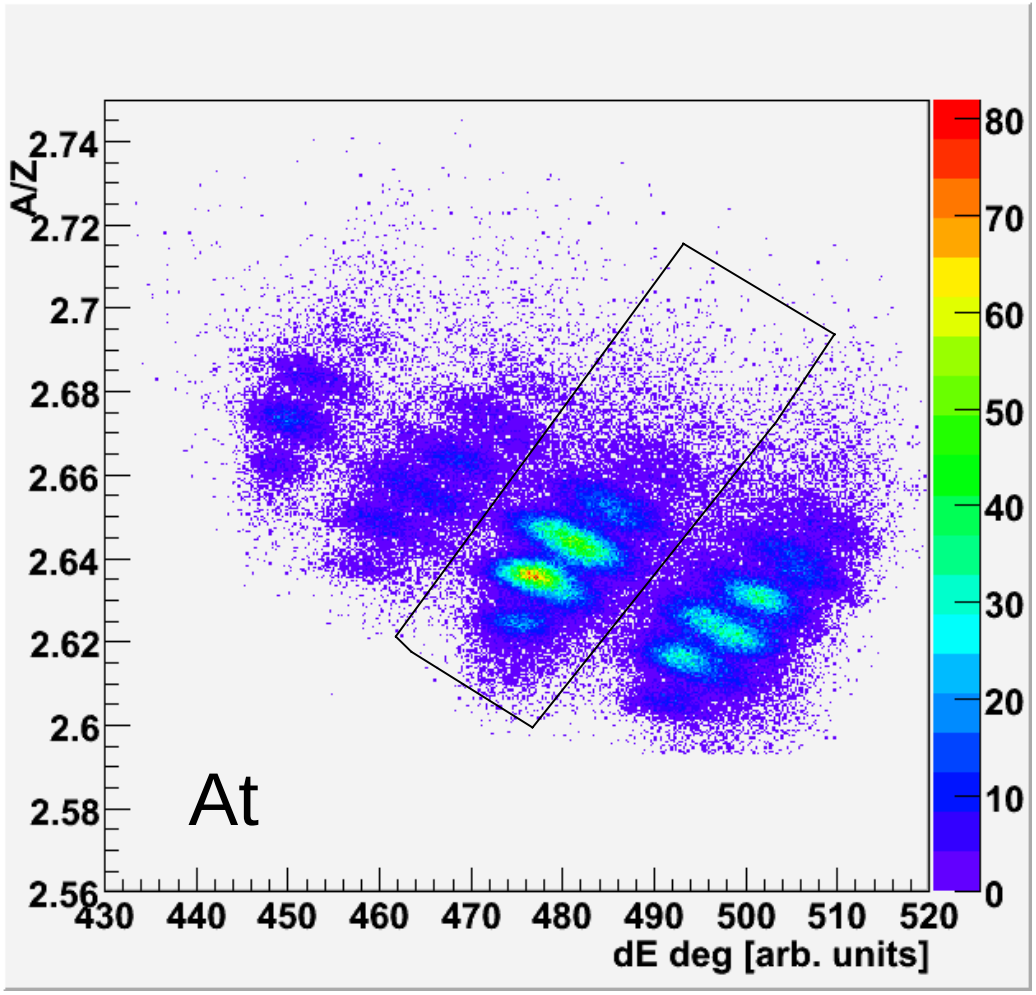
^{226}At setting – Z identification



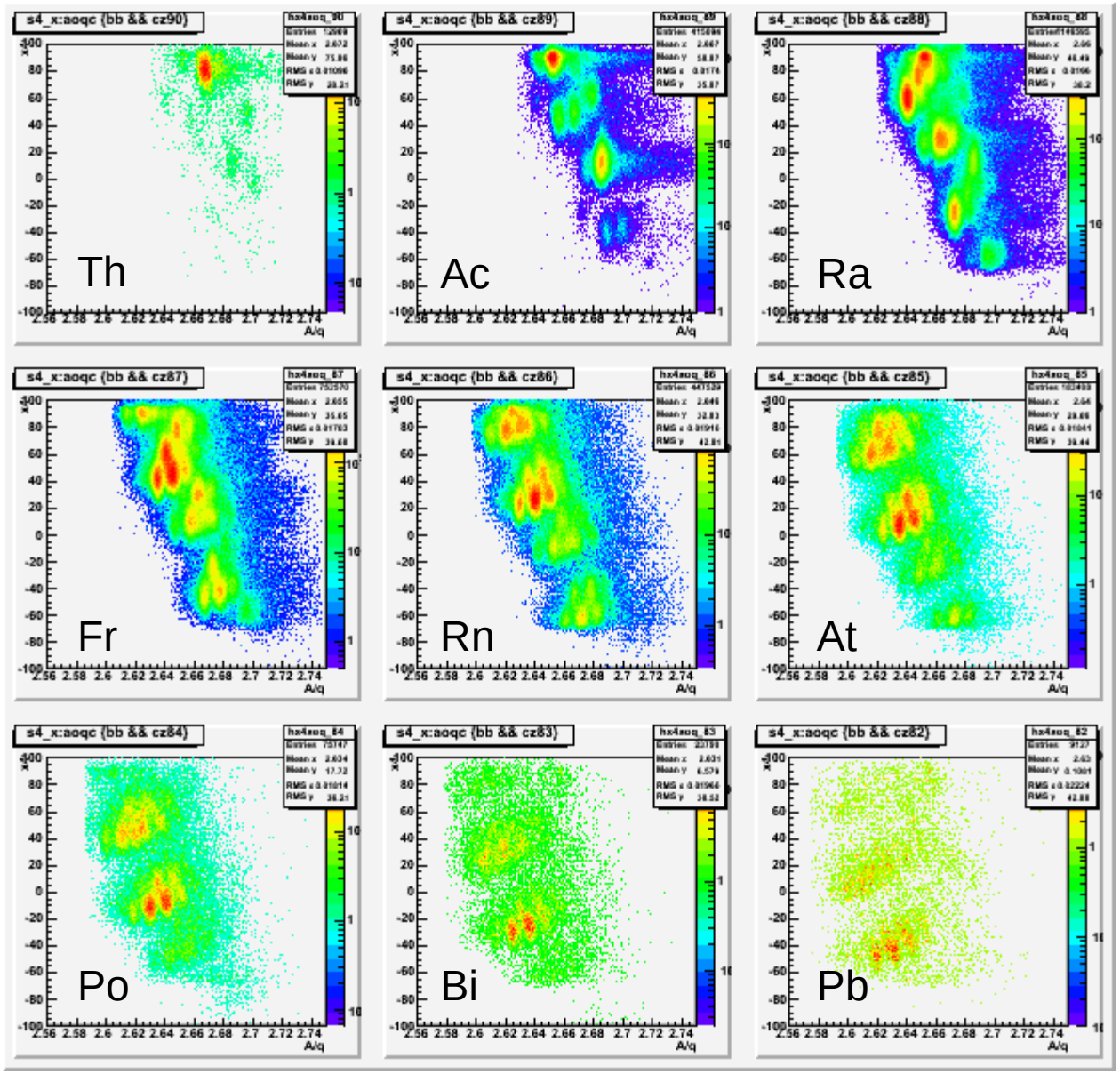


Charge state selection

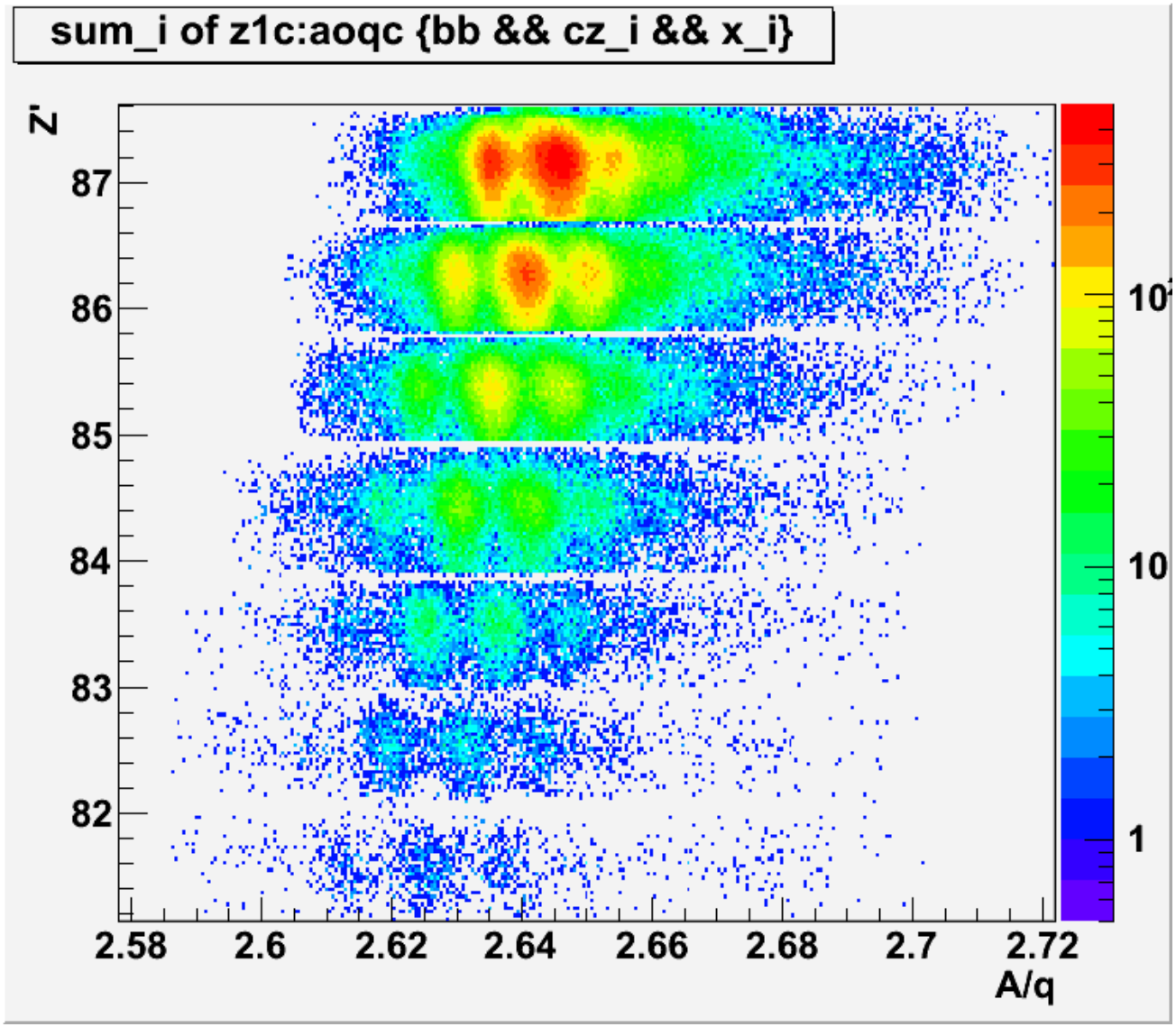
^{226}At setting – Δq=0 selection



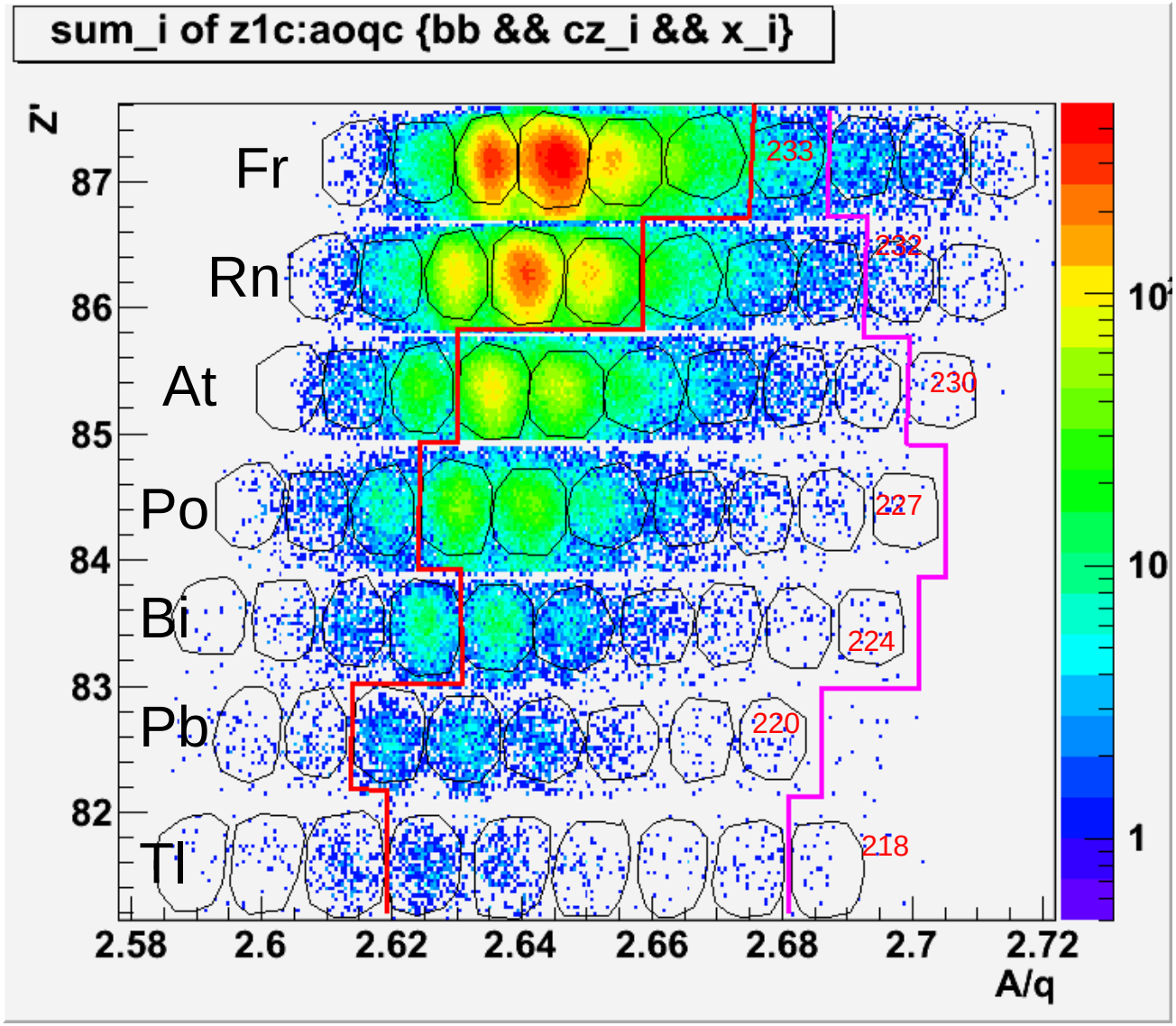
^{226}At setting



^{226}At setting – identification plot



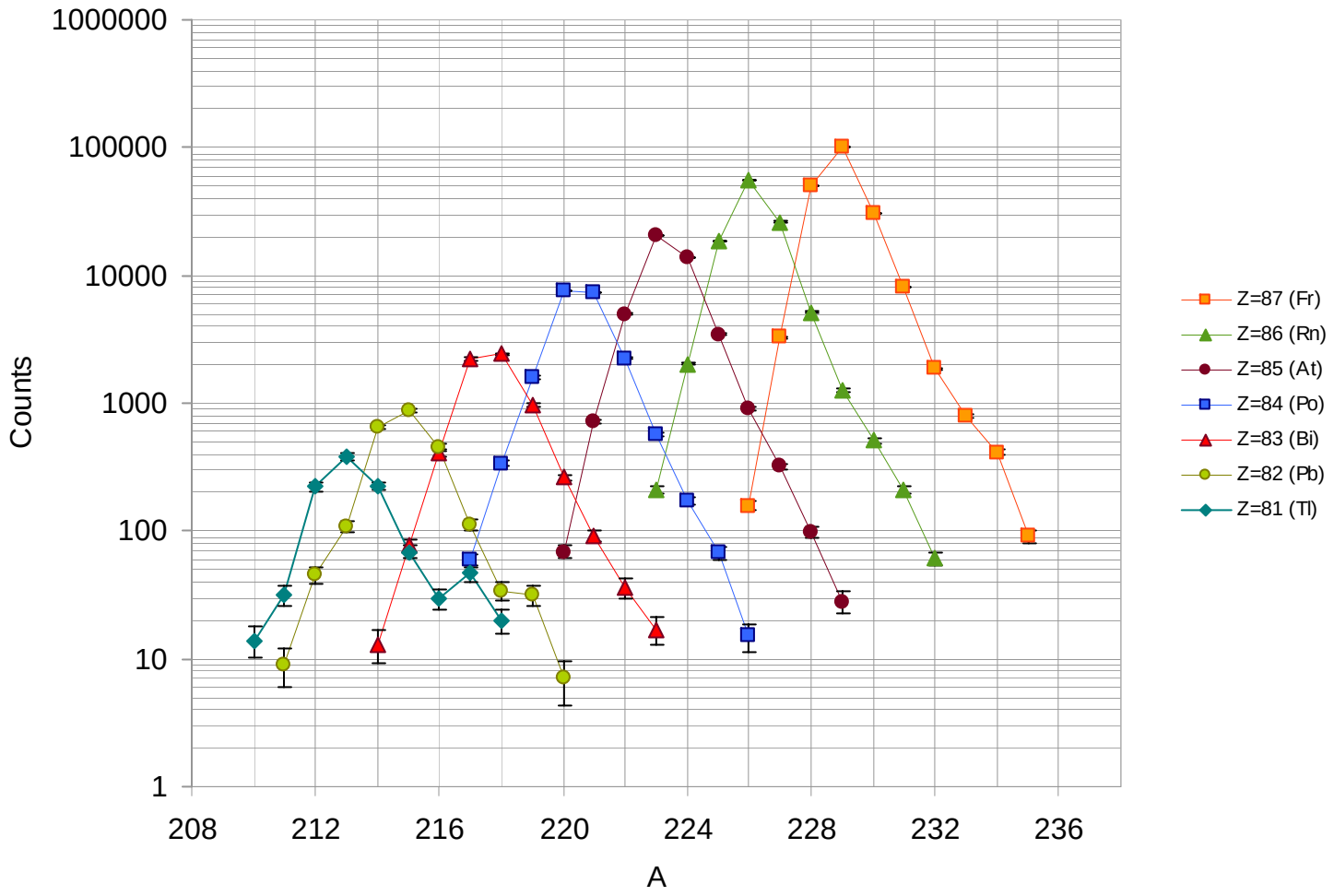
^{226}At setting – identification plot



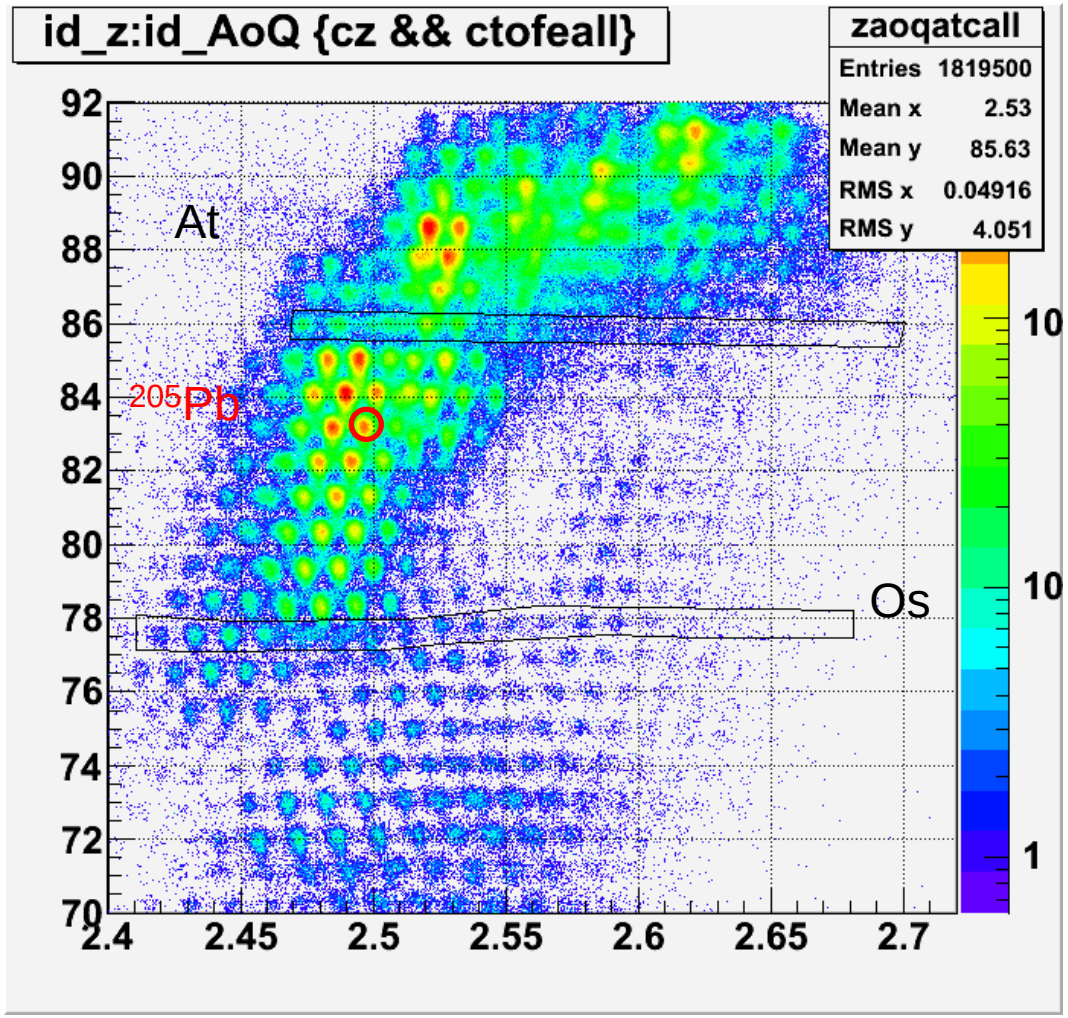
Karslruher Nuklidkarte, rev. 2009

H. Alvarez-Pol, et al. arXiv:1007.5506v1 [nucl-ex], Phys. Rev. C 82 (2010) 041602(R)

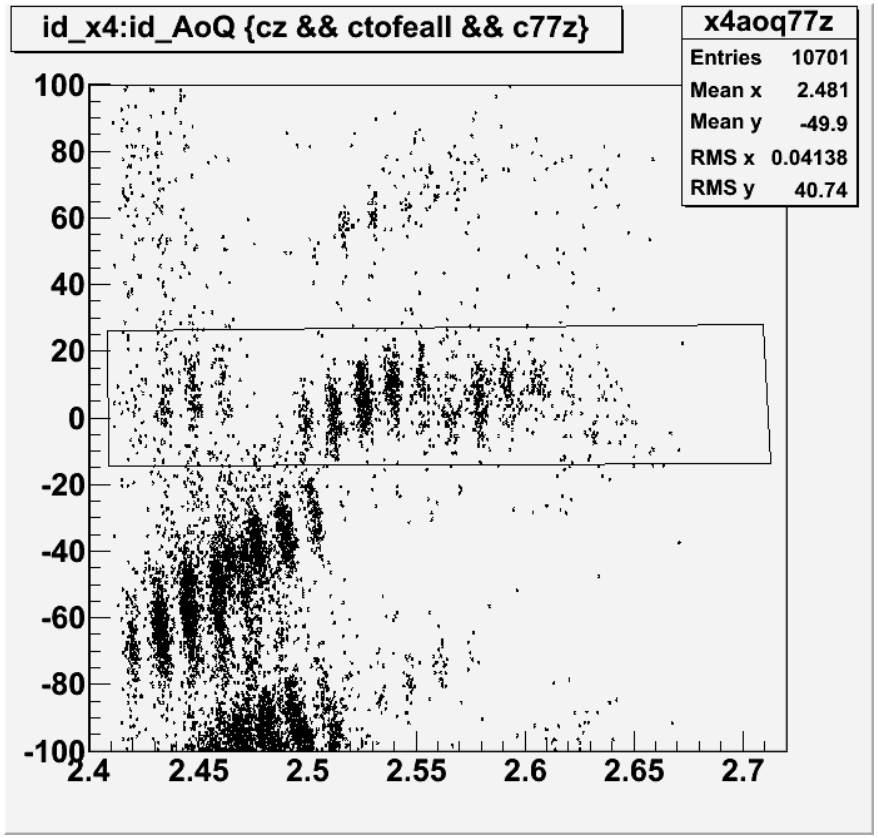
^{226}At setting – production count rates

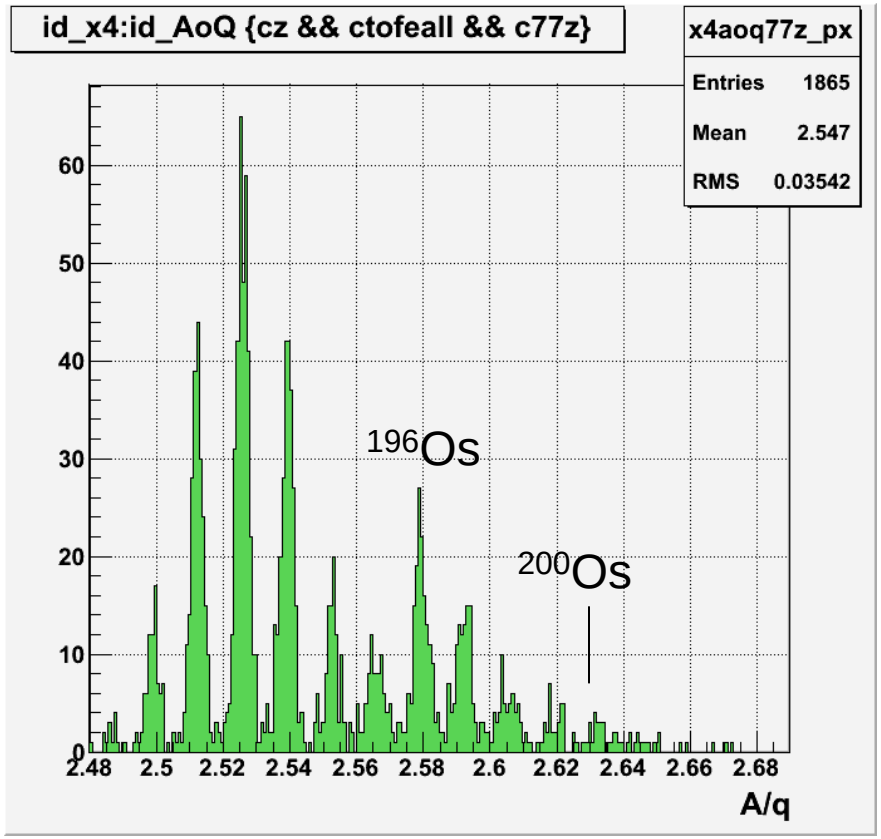


FRS000 ToF test – identification plot

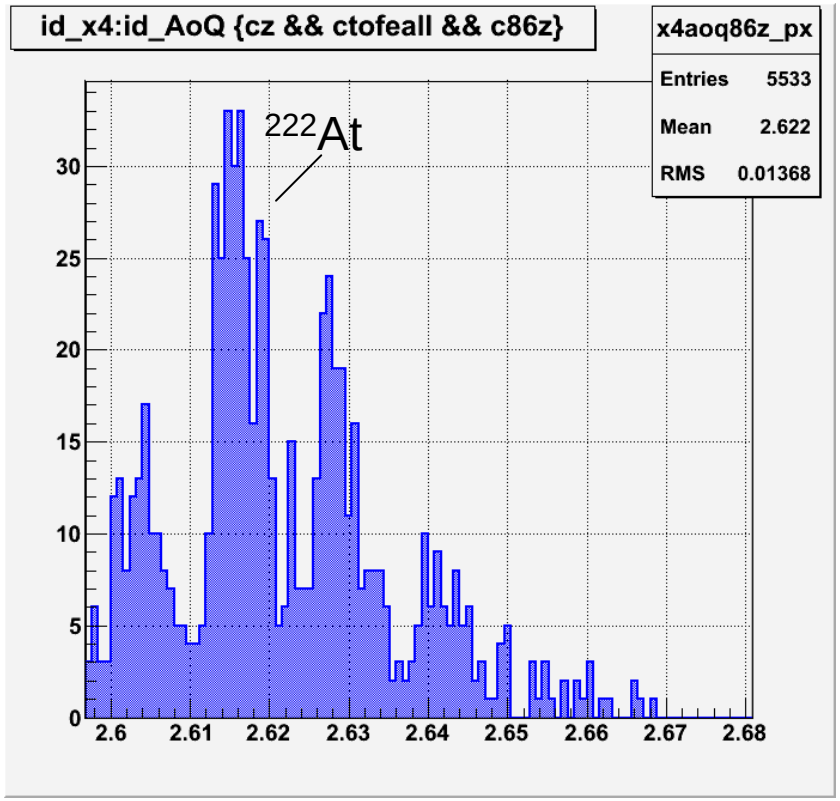


^{194,198,202}Os setting – identification plot





^{226}At setting – identification plot



Summary

- FRS a powerful tool for new isotope production
- New isotopes observed in Nd-Tm and Pb-Ac regions (~25)
- Fragmentation of ^{238}U: possible to aproach Os, Ir, Pt region (^{208}Pb better?)

J. Benlliure et al. arXiv:1004.0265 [nucl-ex]

S392 Collaborators

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