Search for heavy neutron-rich isotopes

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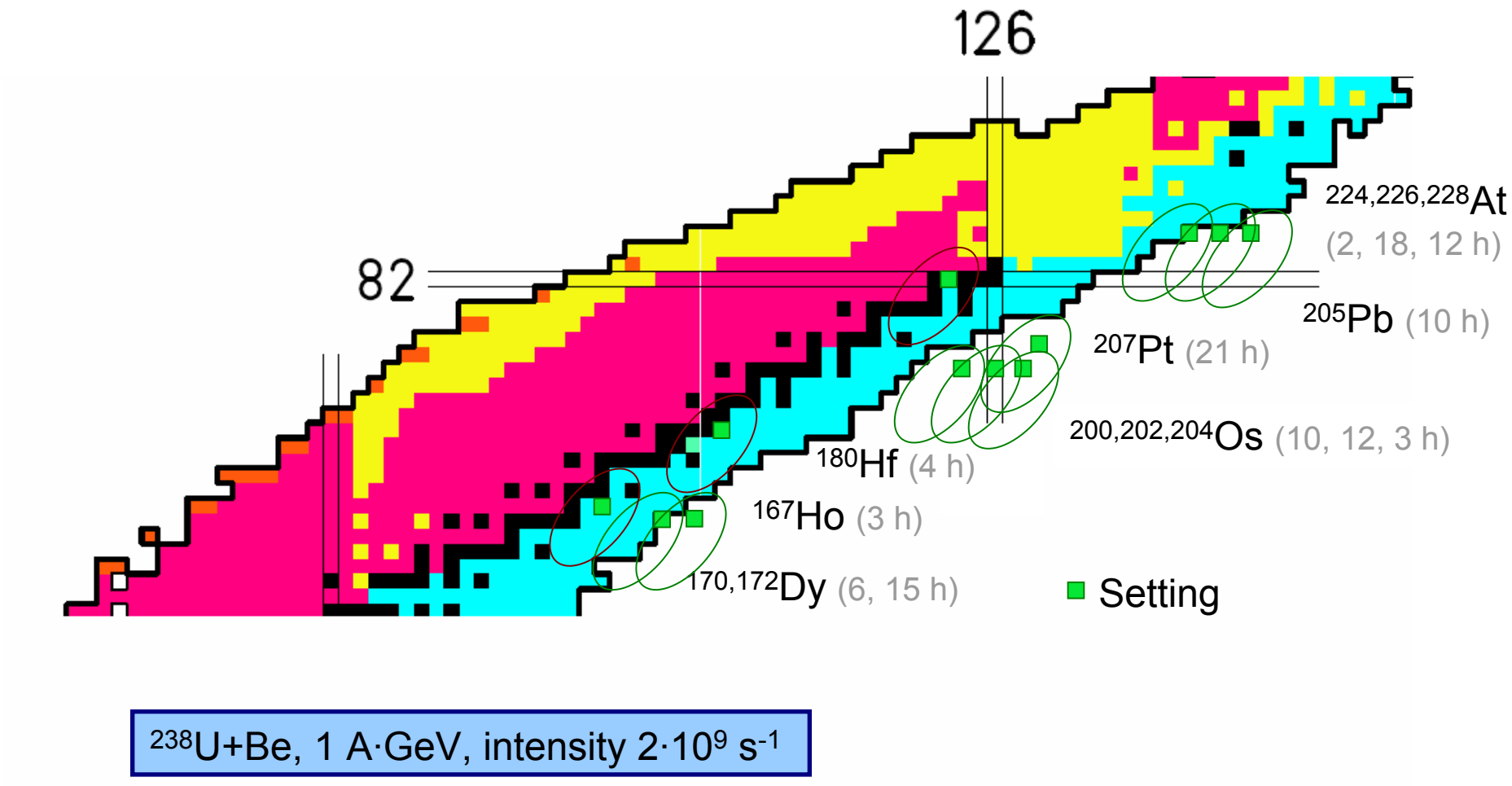
For the S392 collaboration

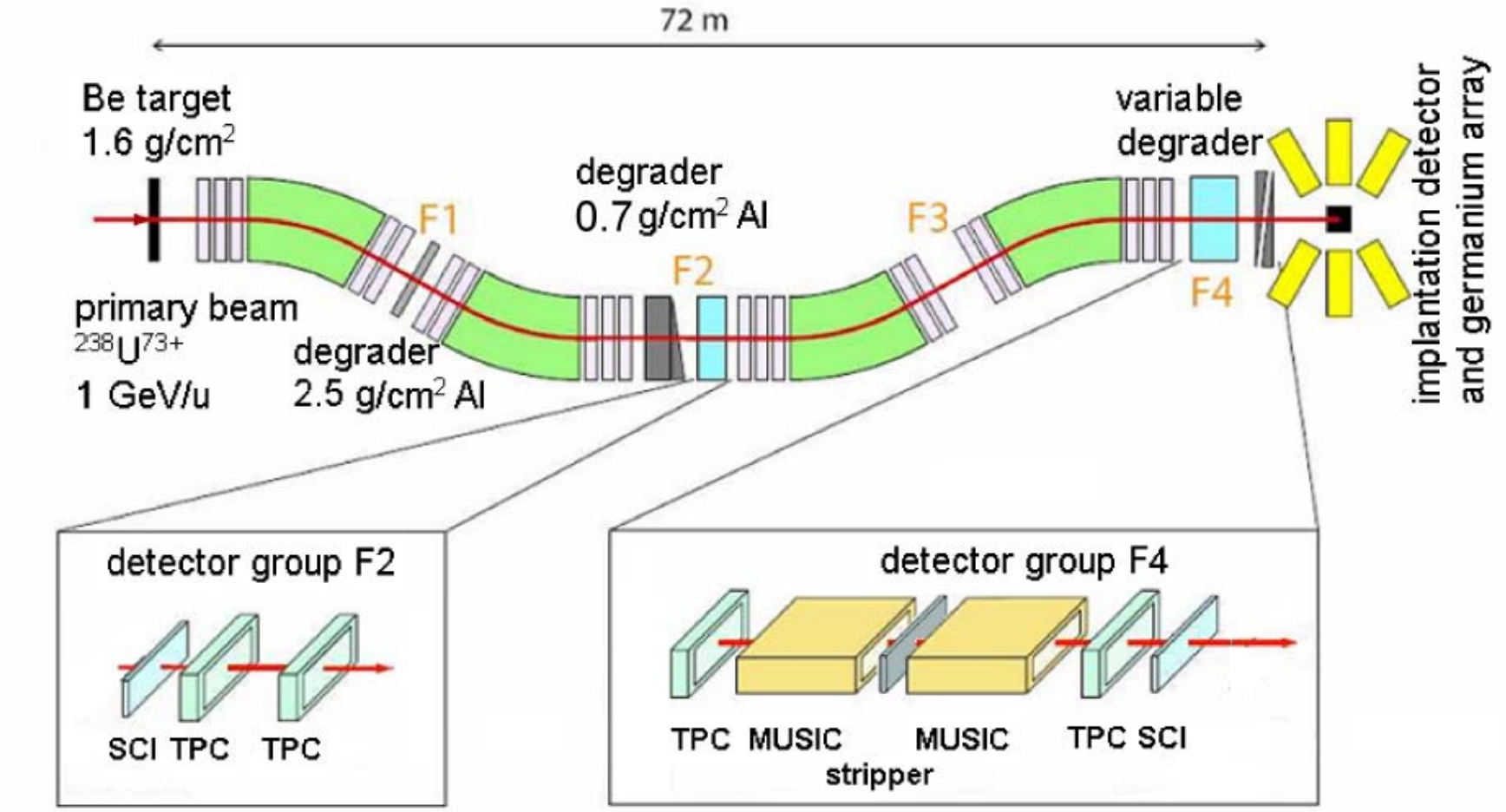
FRS User Meeting
28.11.2011

S392 Oct09 - FRS settings



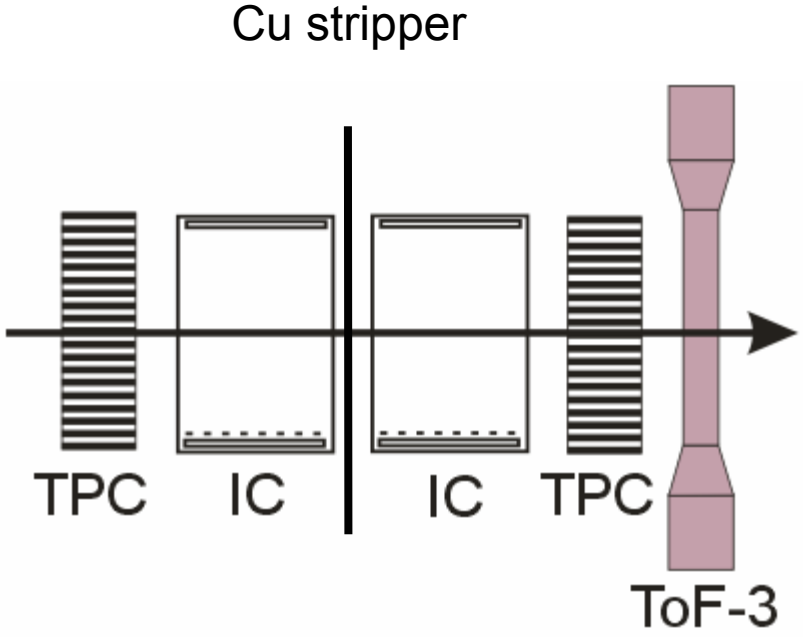
^{238}U+Be, 1 A·GeV, intensity 2·10^{9} s^{-1}

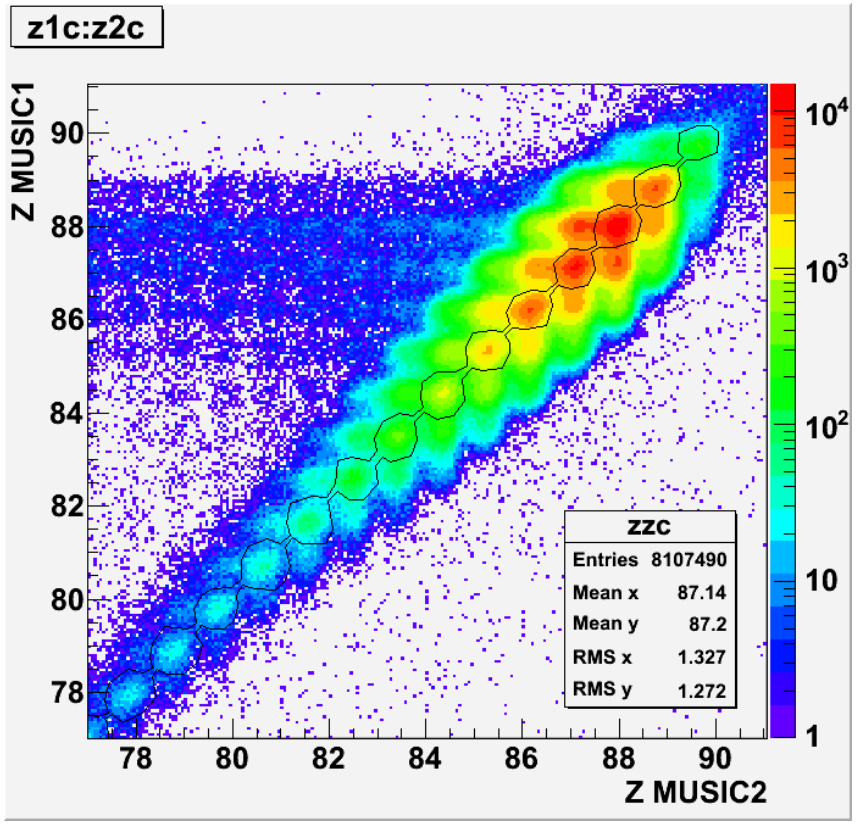
S392 Experimental Setup



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

^{226}At setting – Z identification

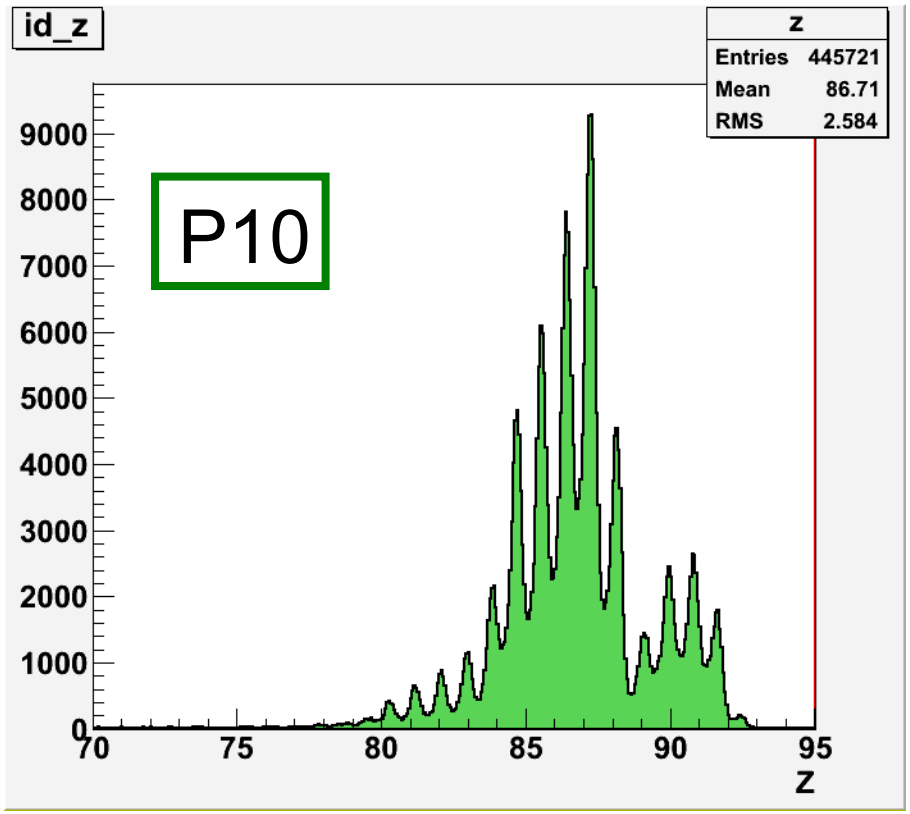


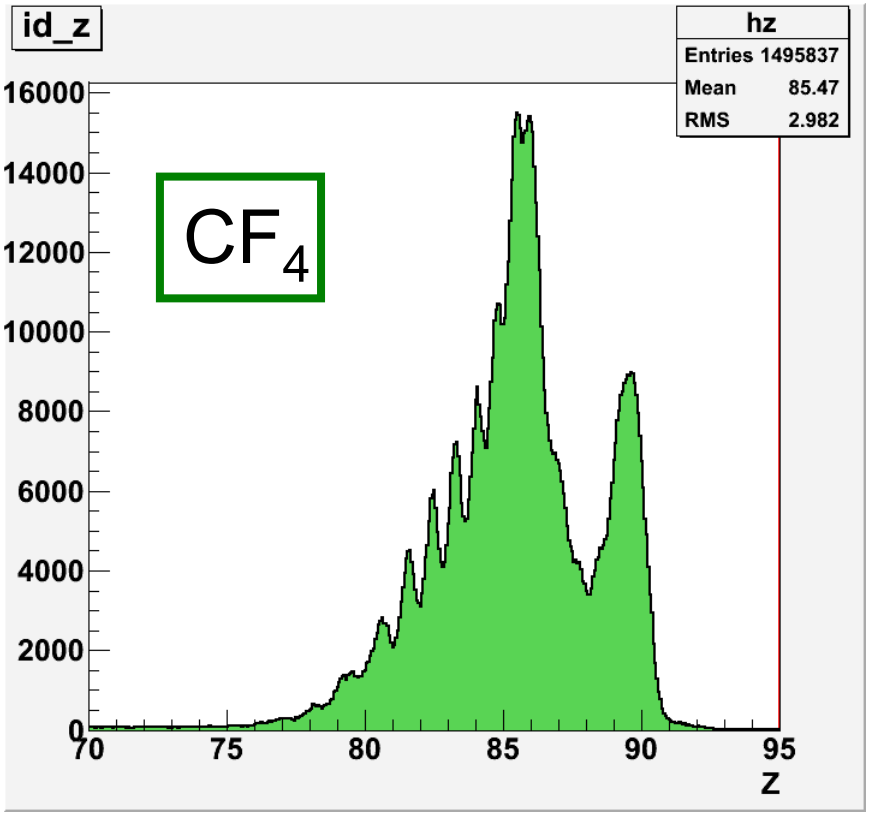


Charge state selection

MUSIC energy resolution

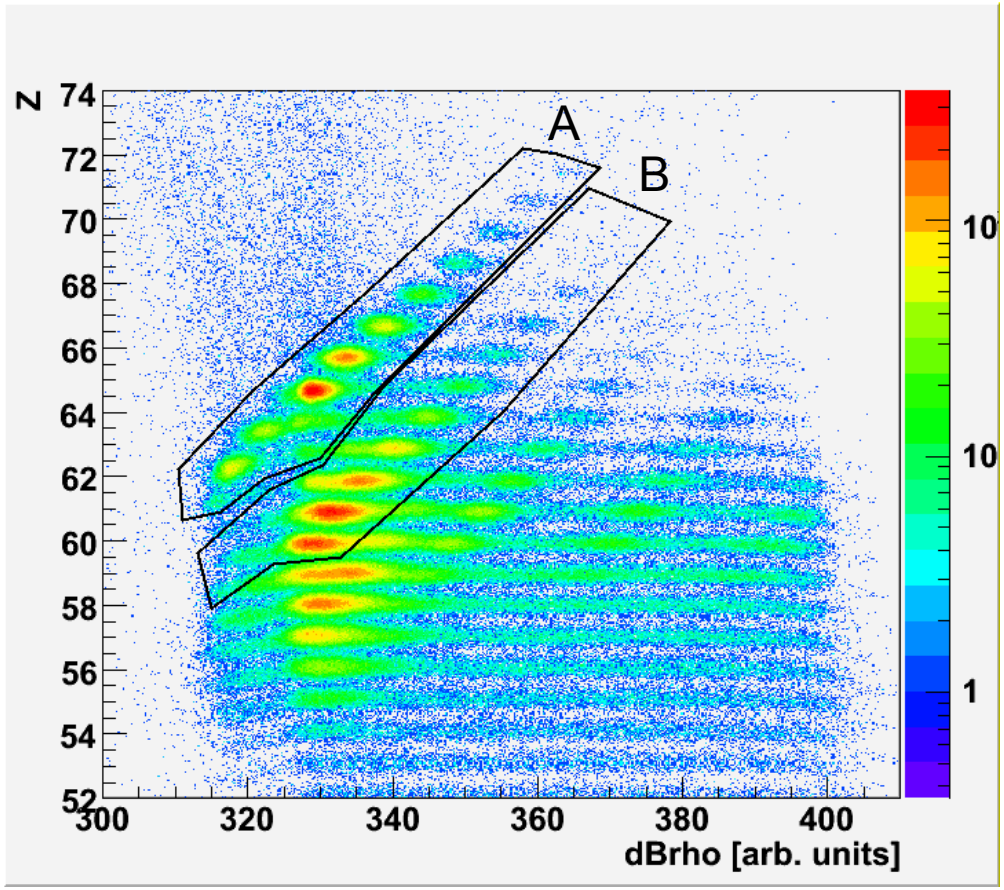
Comparison of MUSIC dE for ^{205}Pb setting

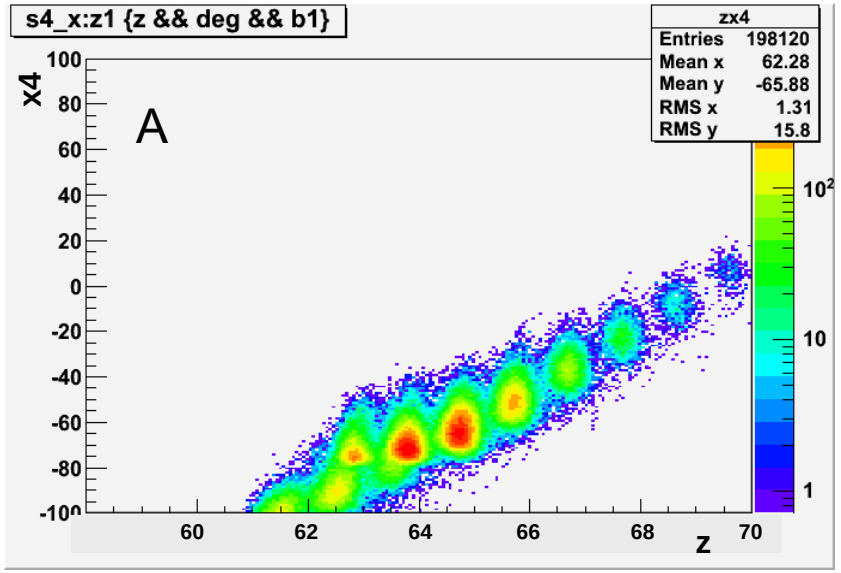


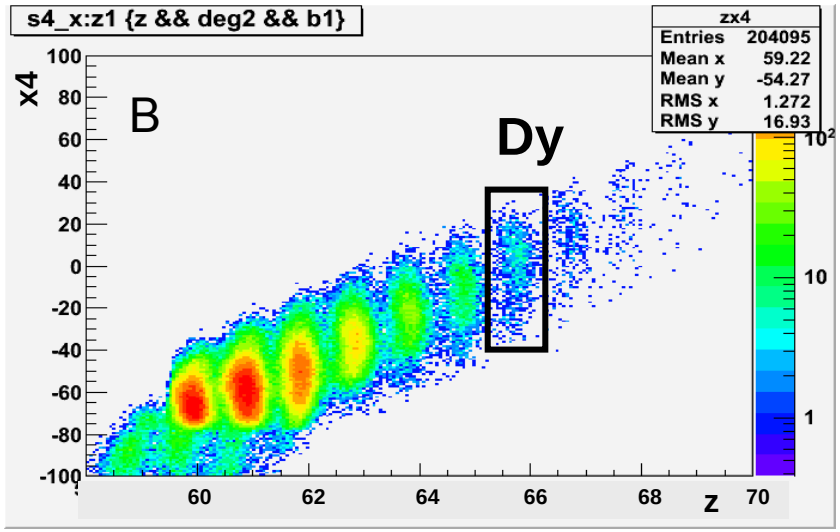


For the heaviest species σ_E decreases by a factor of 0.6

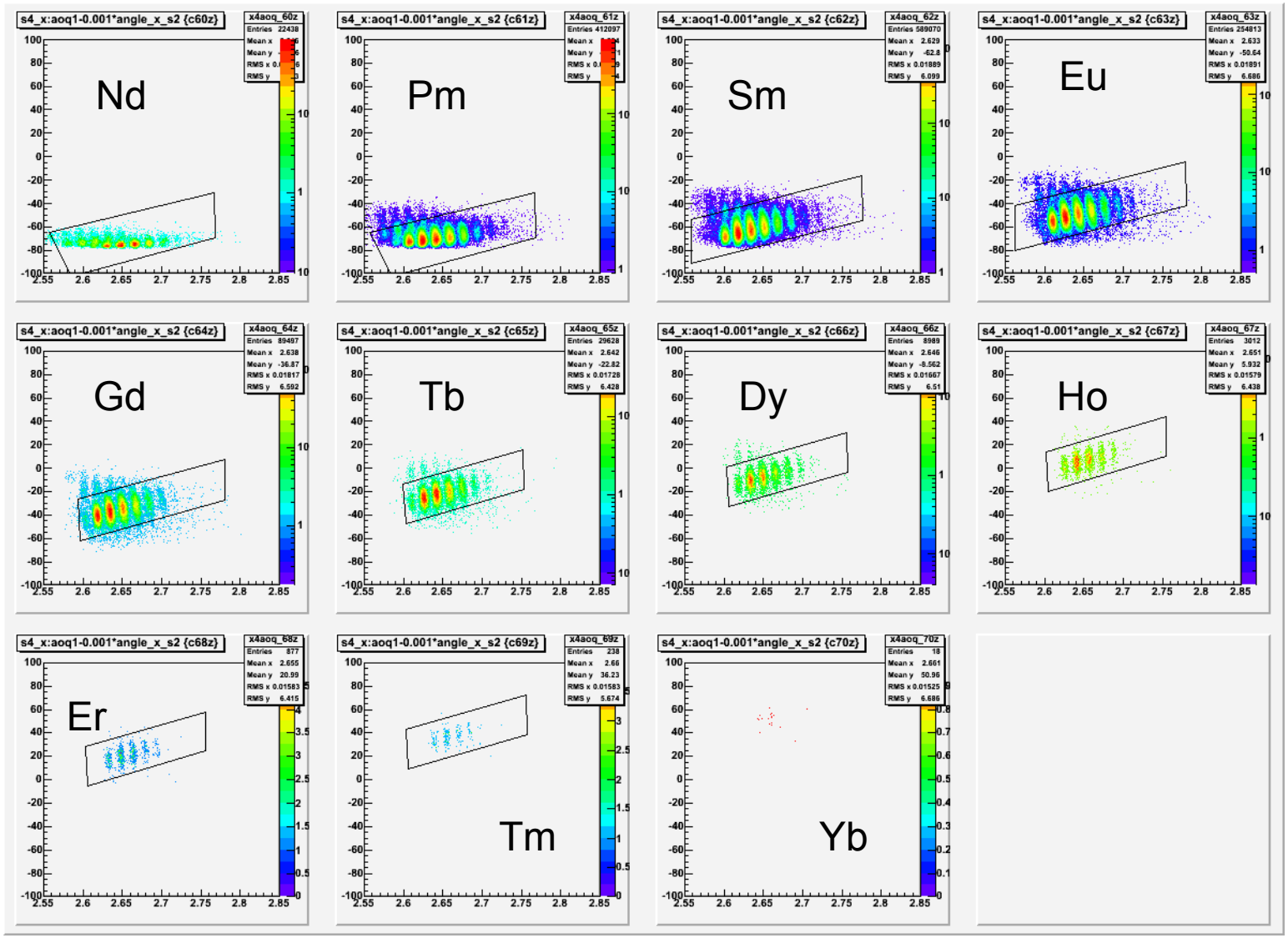
^{172}Dy setting







^{172}Dy setting – S392 Oct09

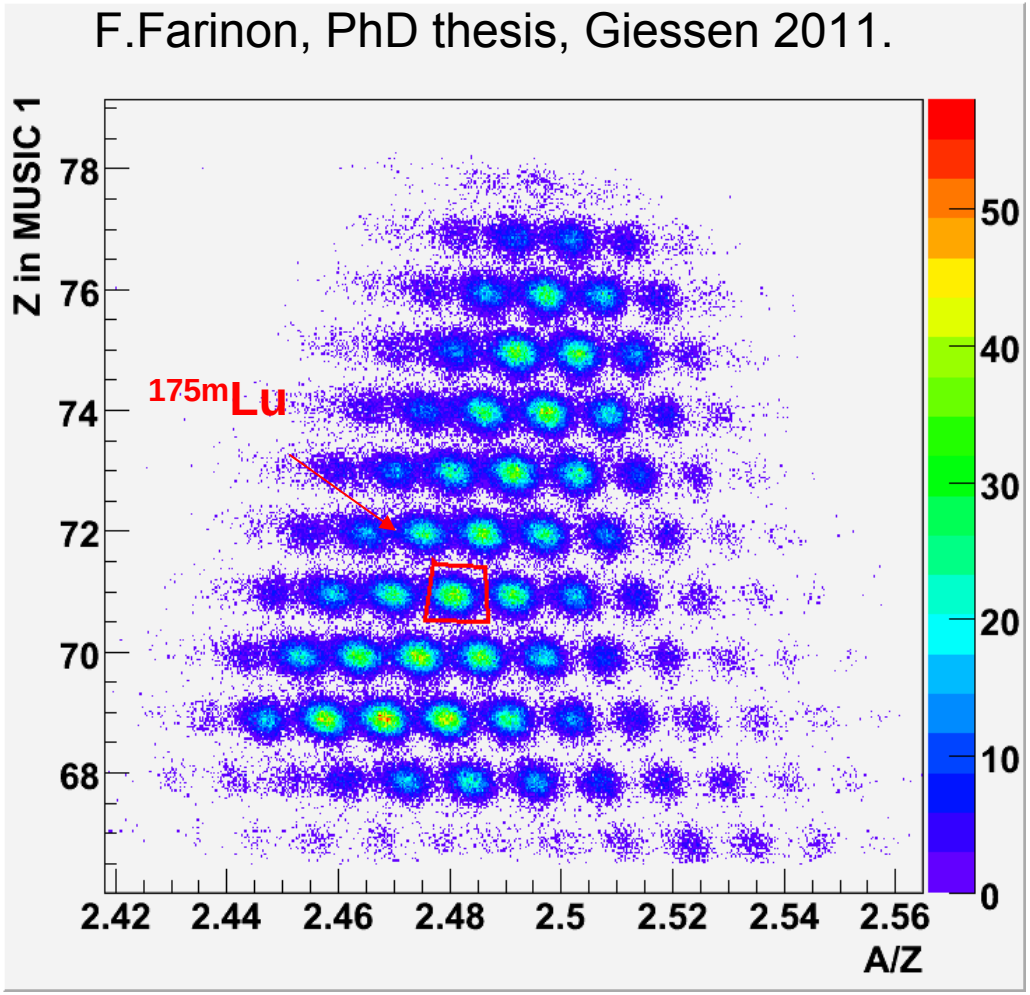


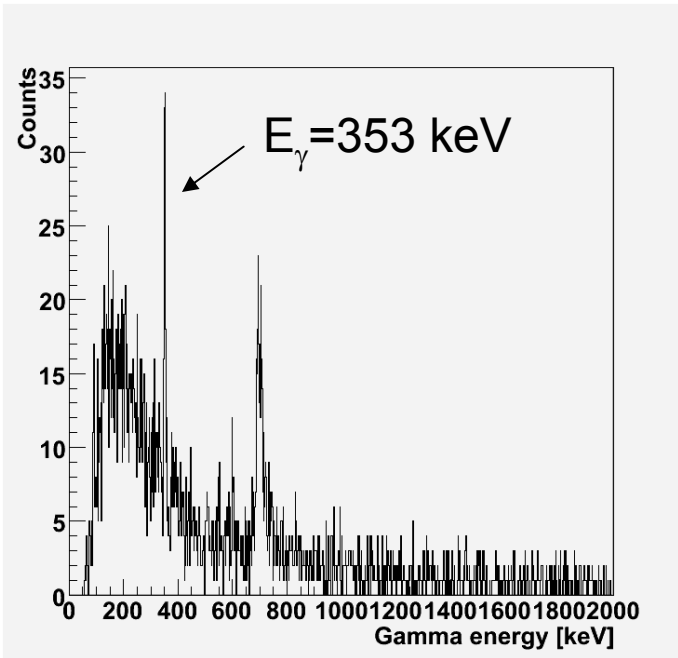
x_4

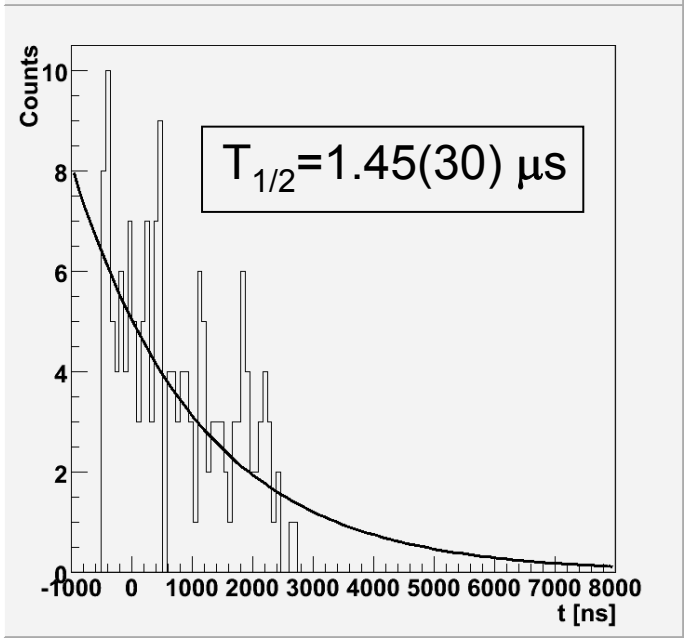
A/q

Isomer tagging technique

F.Farinon, PhD thesis, Giessen 2011.



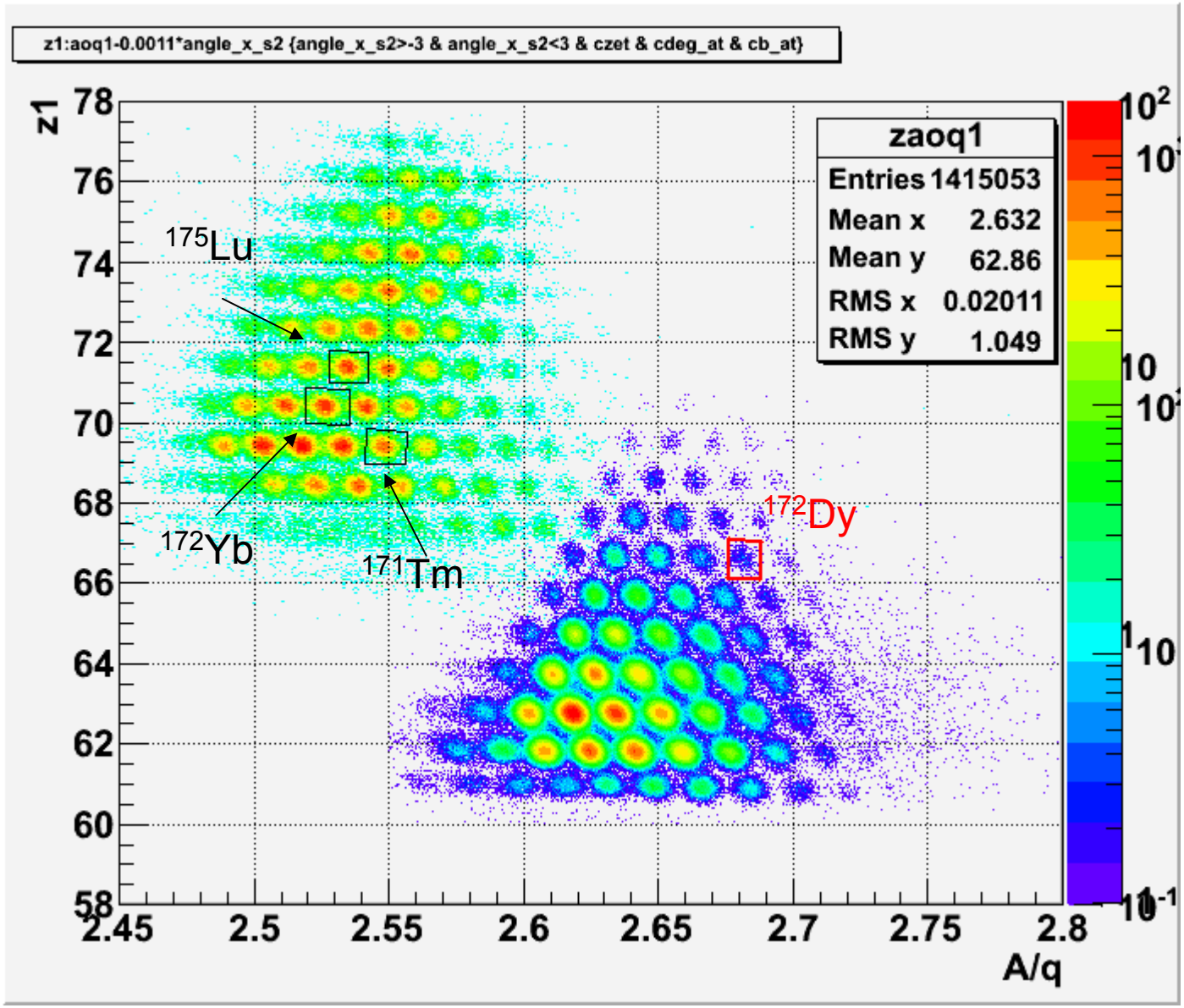




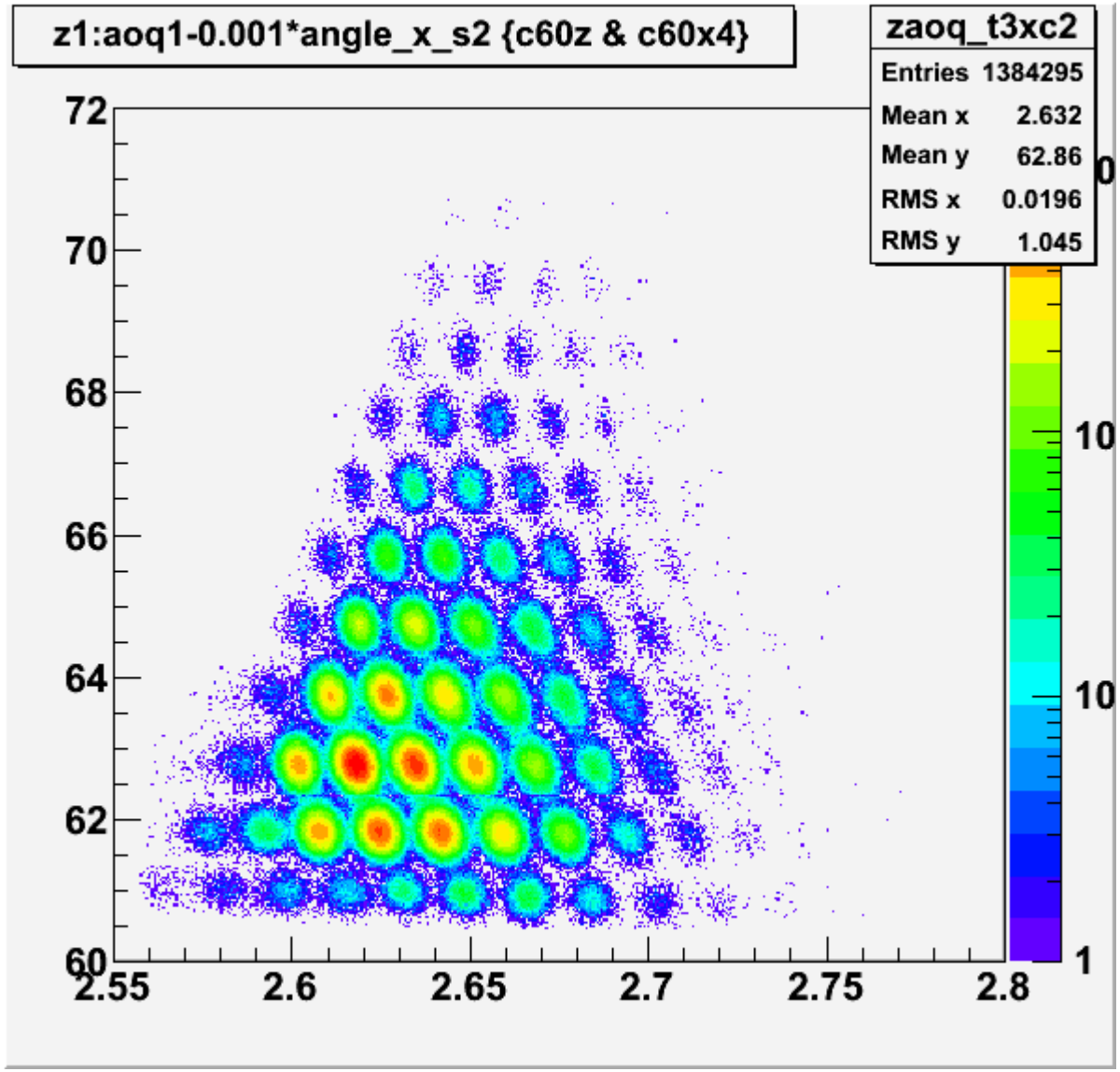
^{175m}Lu: E_γ=353.3 keV ($5/2^- \rightarrow 7/2^+$), $T_{1/2}$=1.49(7) μs

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

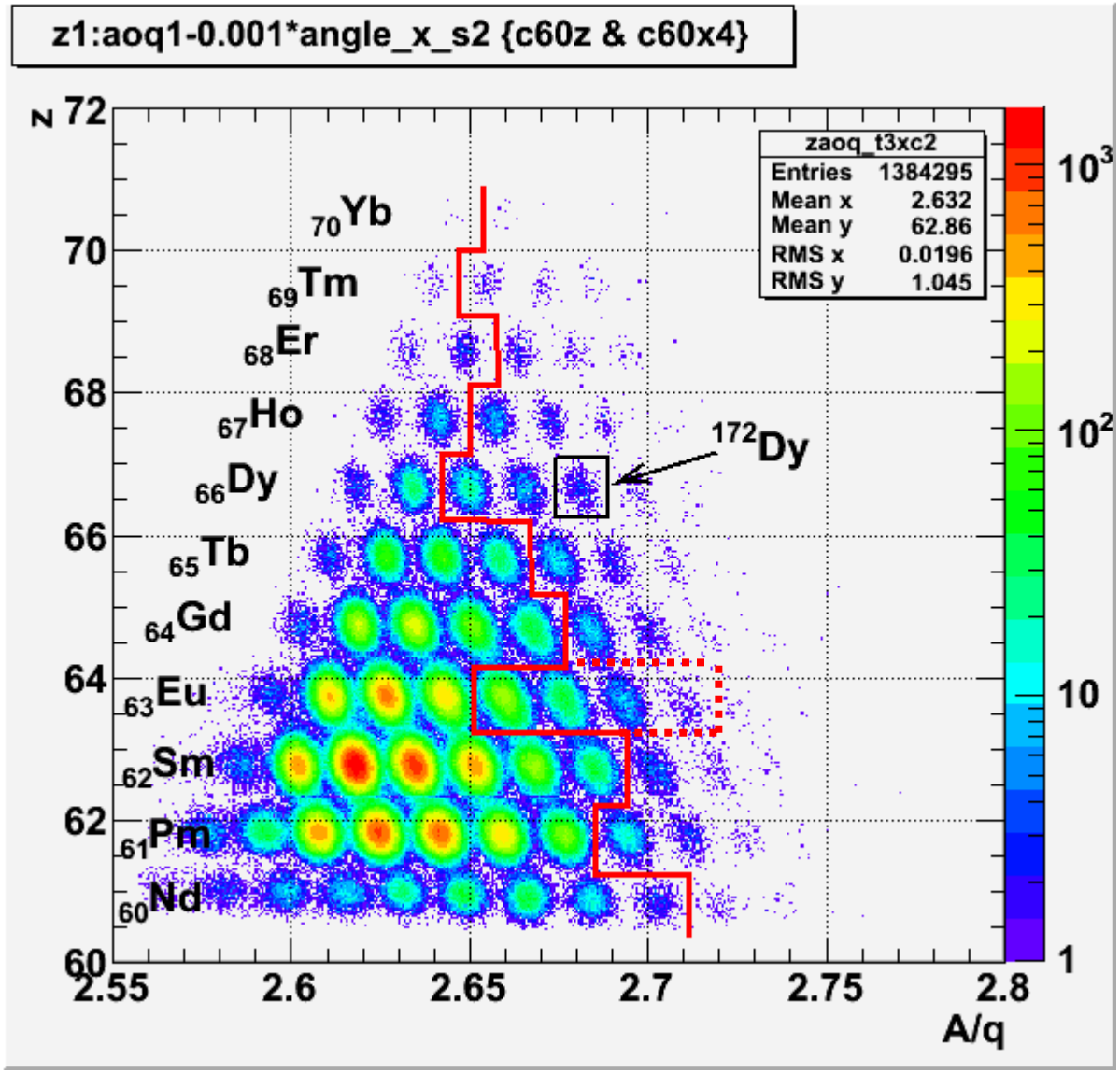
^{180}Hf + ^{172}Dy setting – S392 Oct09



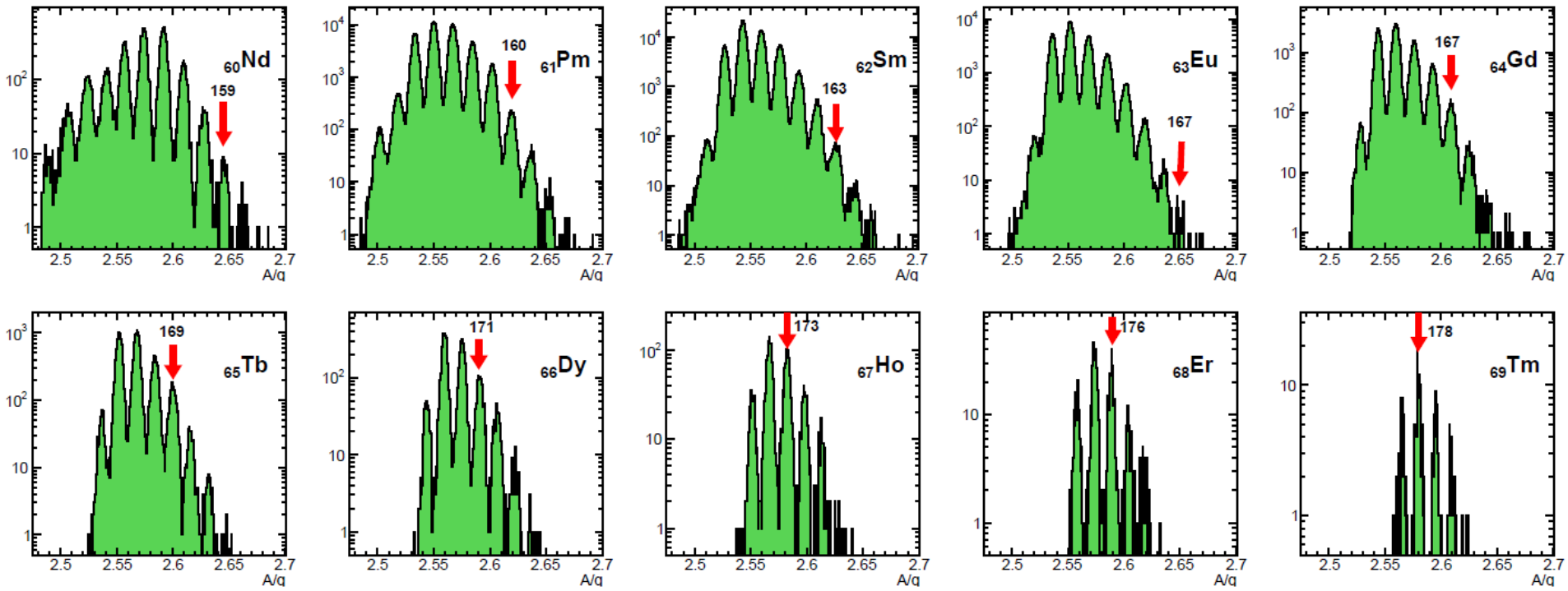
^{172}Dy setting – S392 Oct09



^{172}Dy setting – S392 Oct09

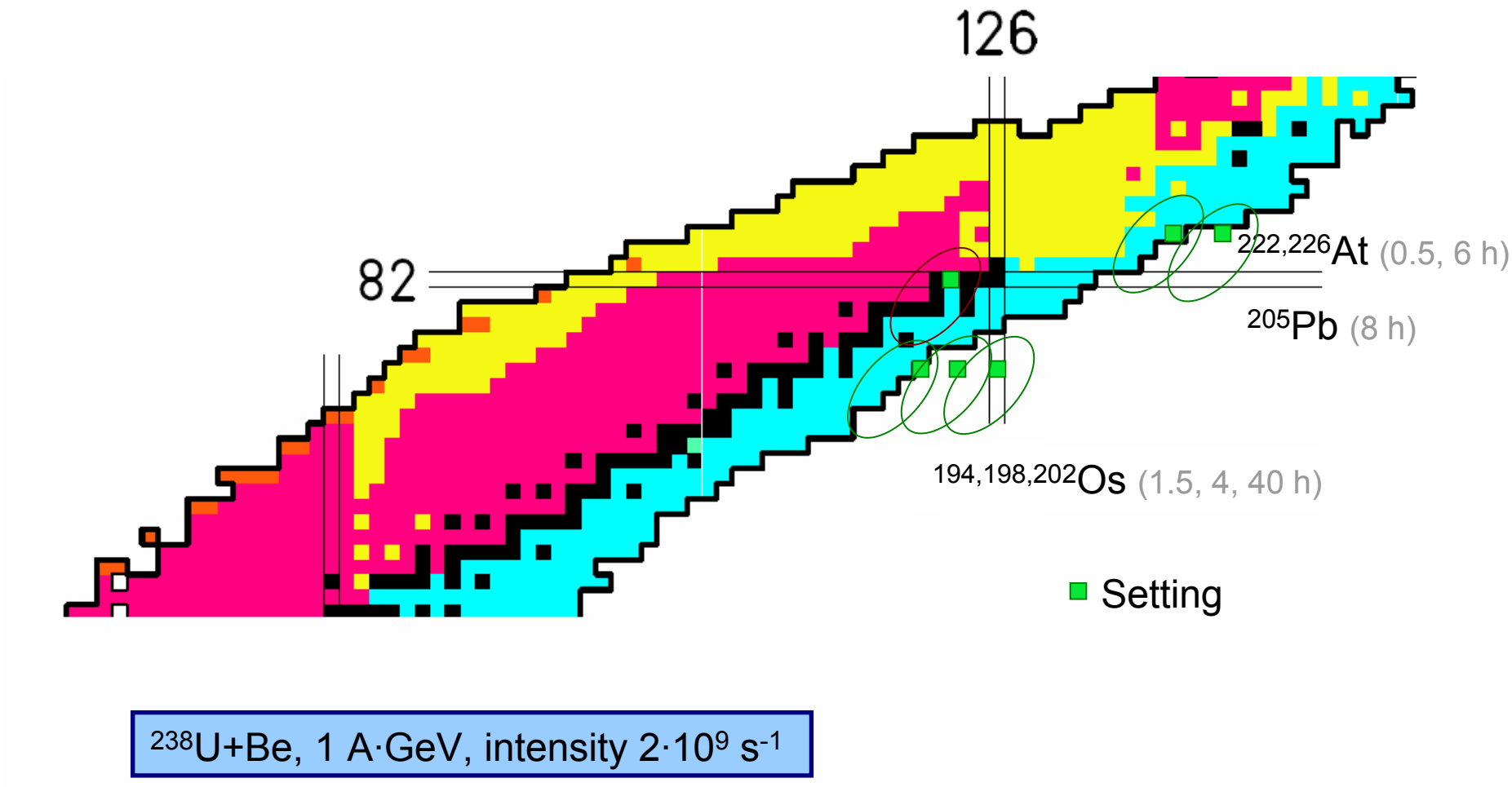


^{172}Dy setting – S392 Oct09



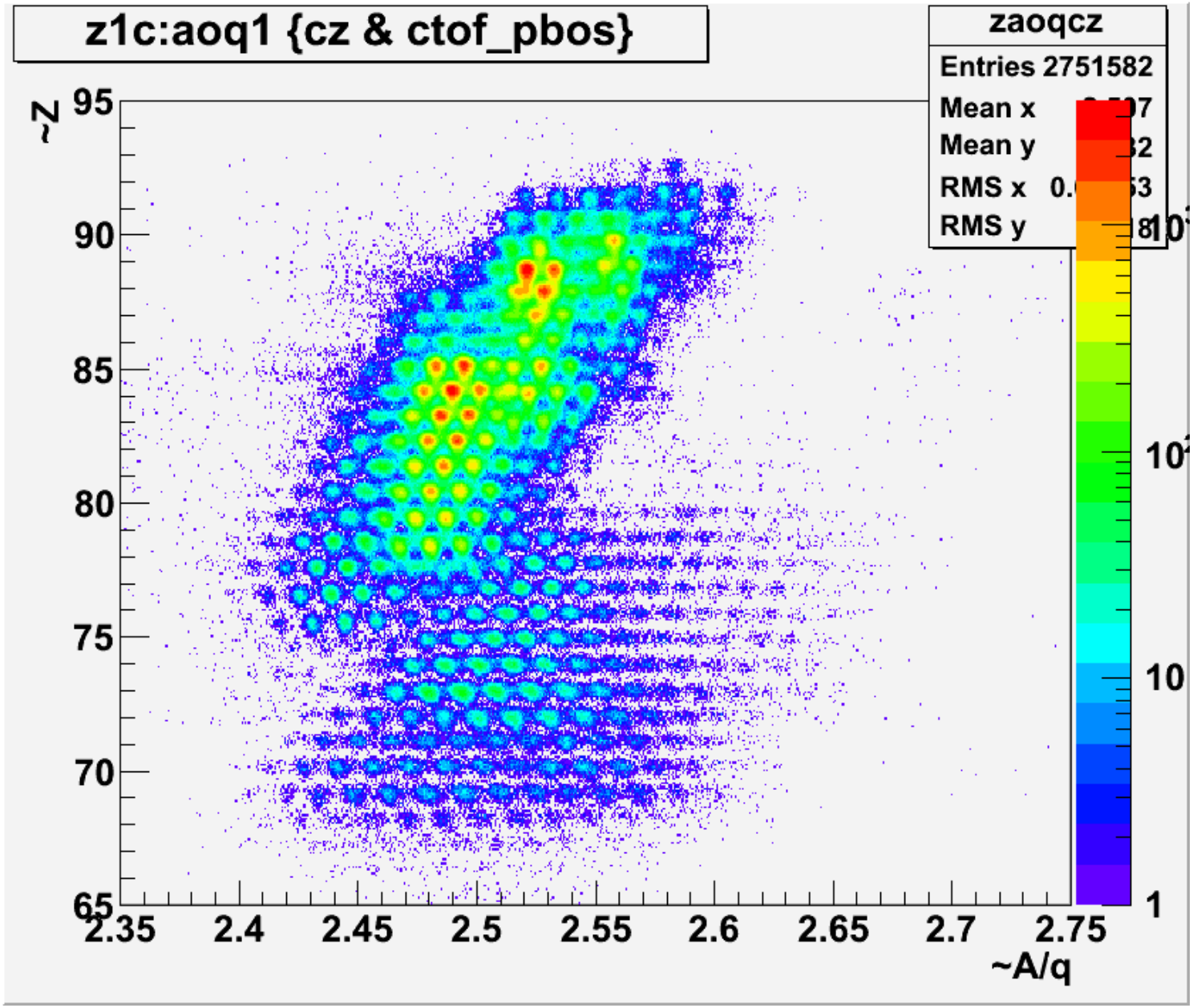
36 hitherto unobserved isotopes

FRS000 Oct10 - FRS settings

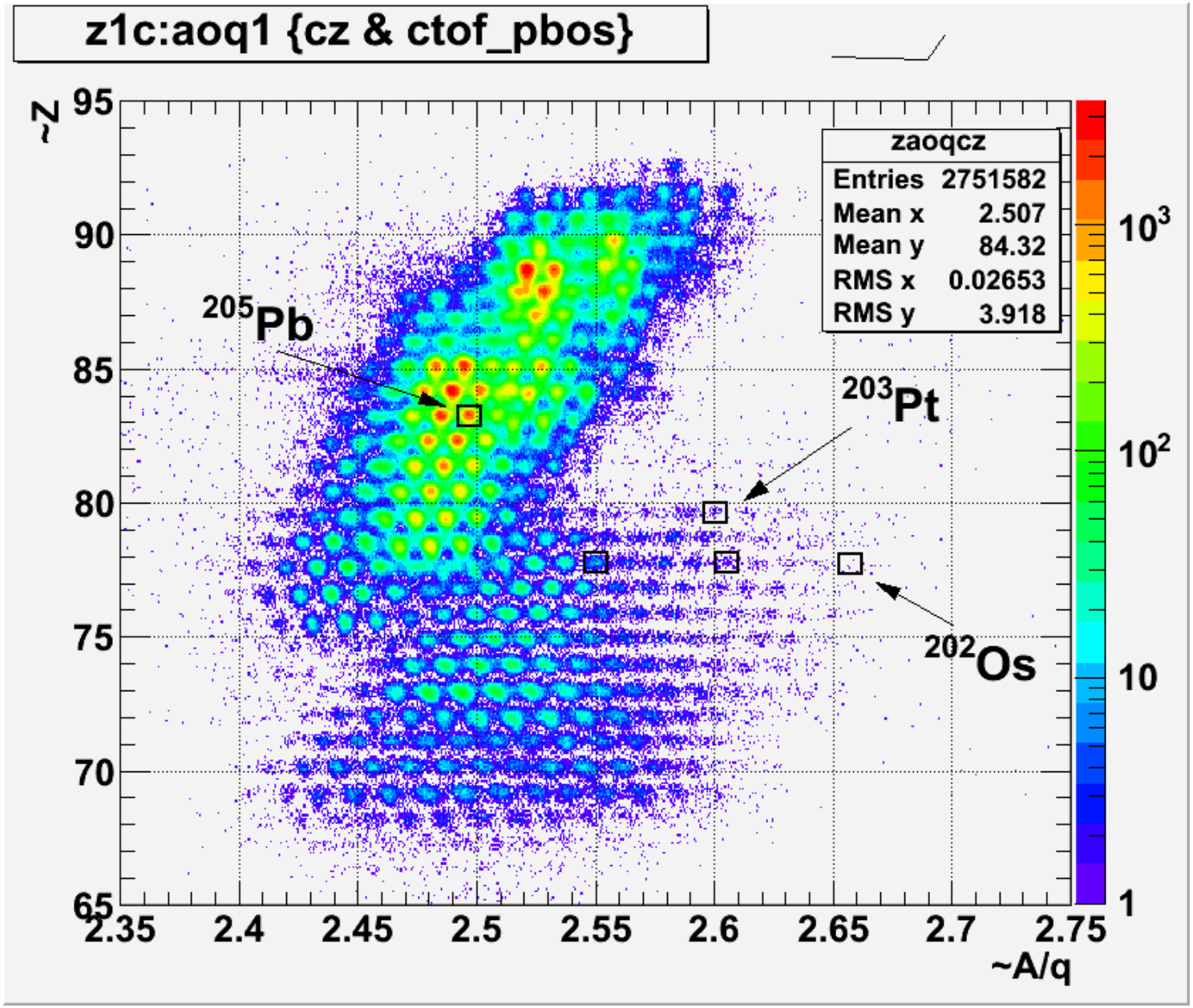


^{238}U+Be, 1 A·GeV, intensity 2·10^{9} s^{-1}

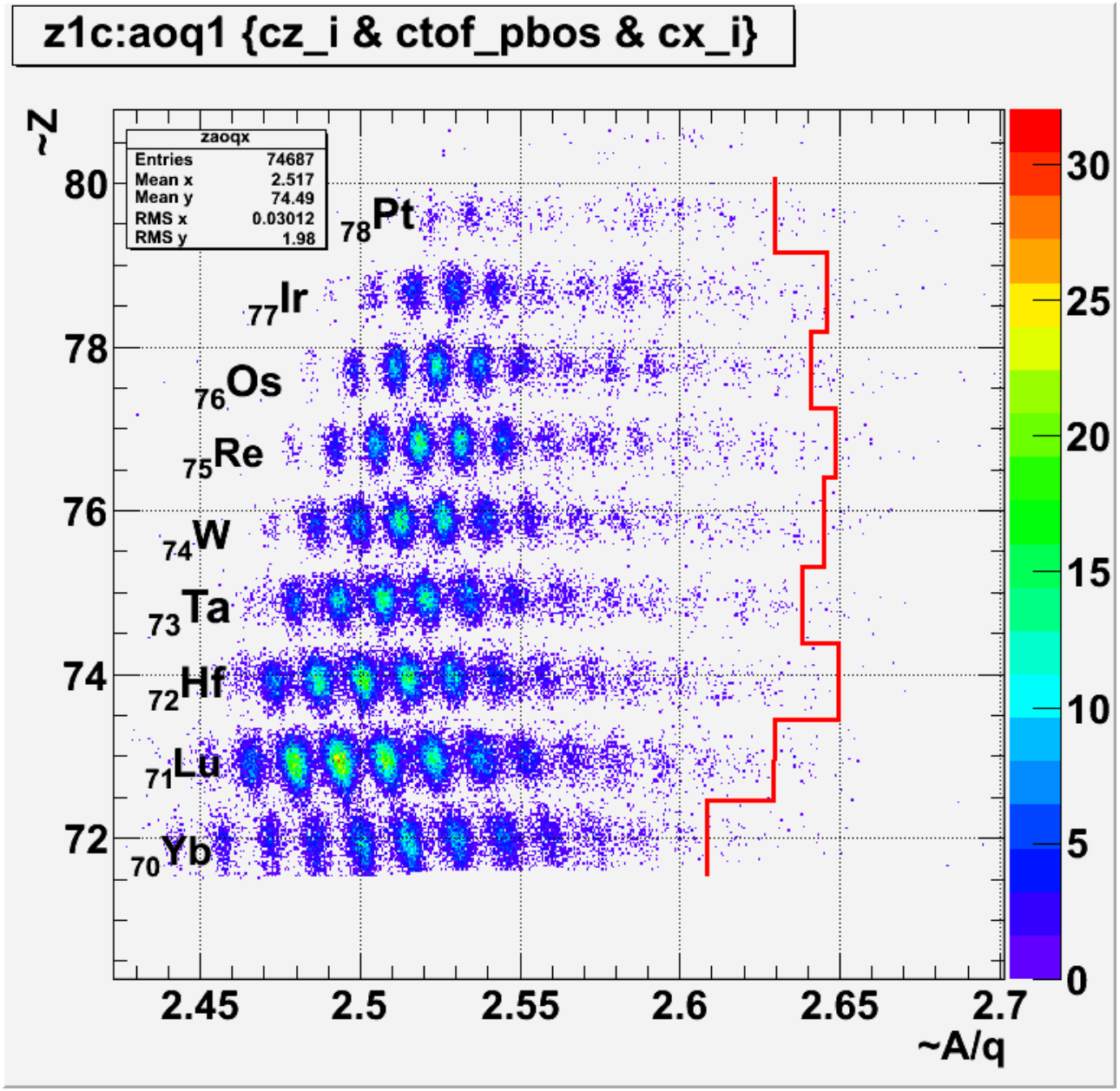
^{205}Pb + ^{194,198,202}Os settings – FRS000 Oct10



^{205}Pb + ^{194,198,202}Os settings – FRS000 Oct10

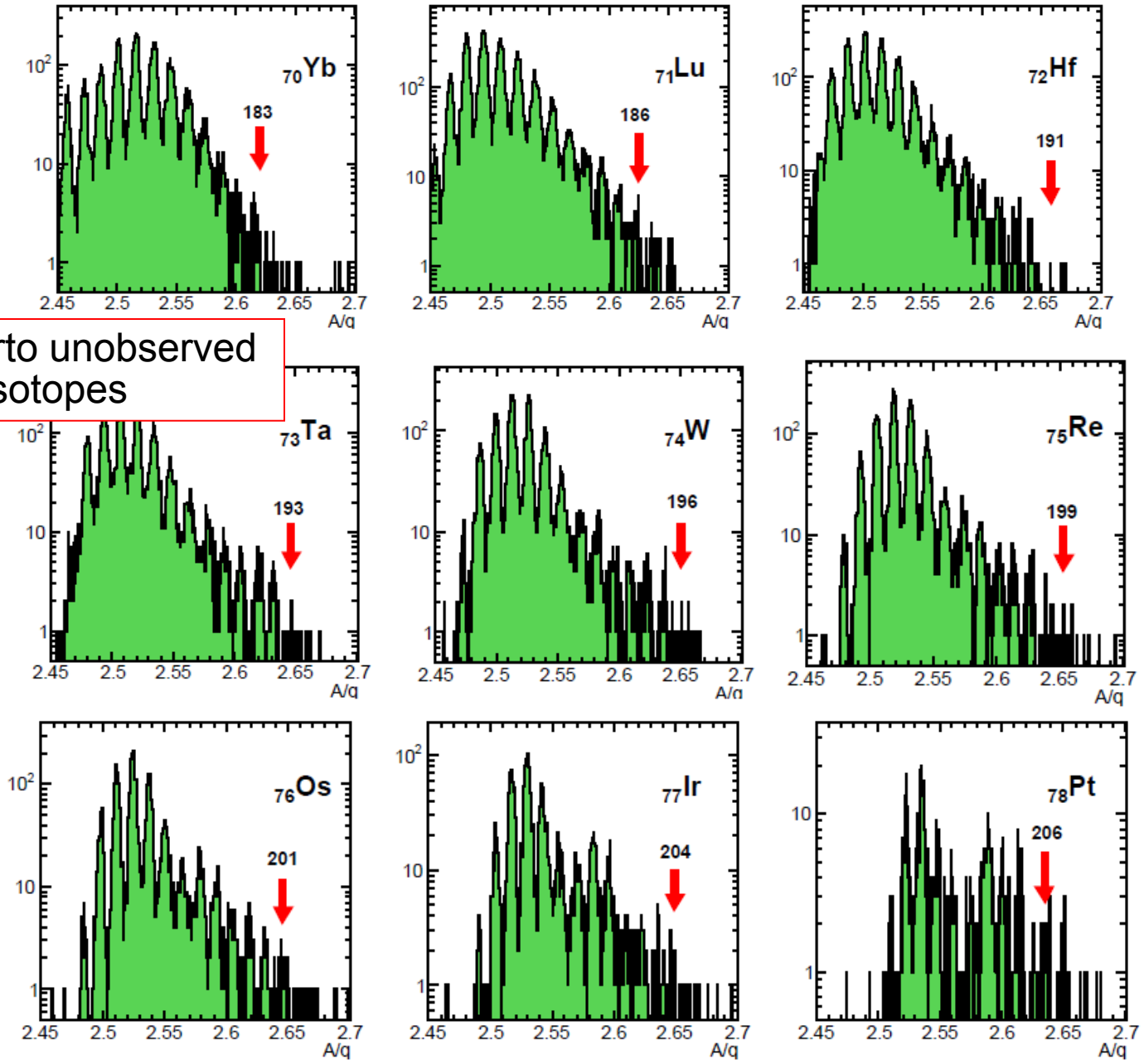


^{194,198,202}Os settings – FRS000 Oct10

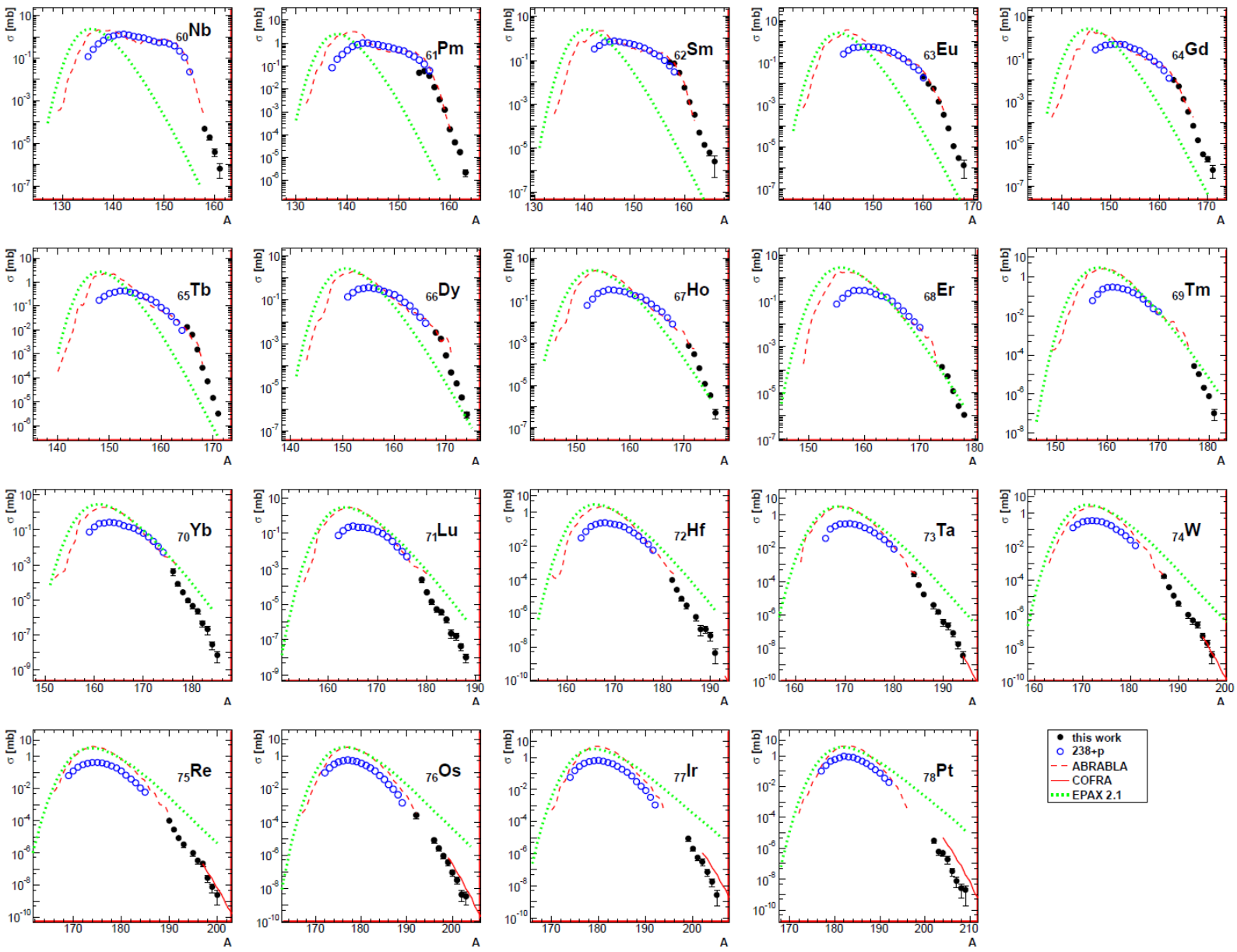


^{194,198,202}Os settings – FRS000 Oct10

21 hitherto unobserved isotopes



Production cross-sections



Summary

- FRS a powerful tool for new isotope production
- 57 New isotopes observed in Nd-Pt regions

Fragmentation of ^{238}U: possible to aproach Os, Ir, Pt region (^{208}Pb, ^{209}Bi better?)

S392 Collaborators

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Thank you