

# Proton-Emitting Isotopes near the $N=82$ Shell Closure

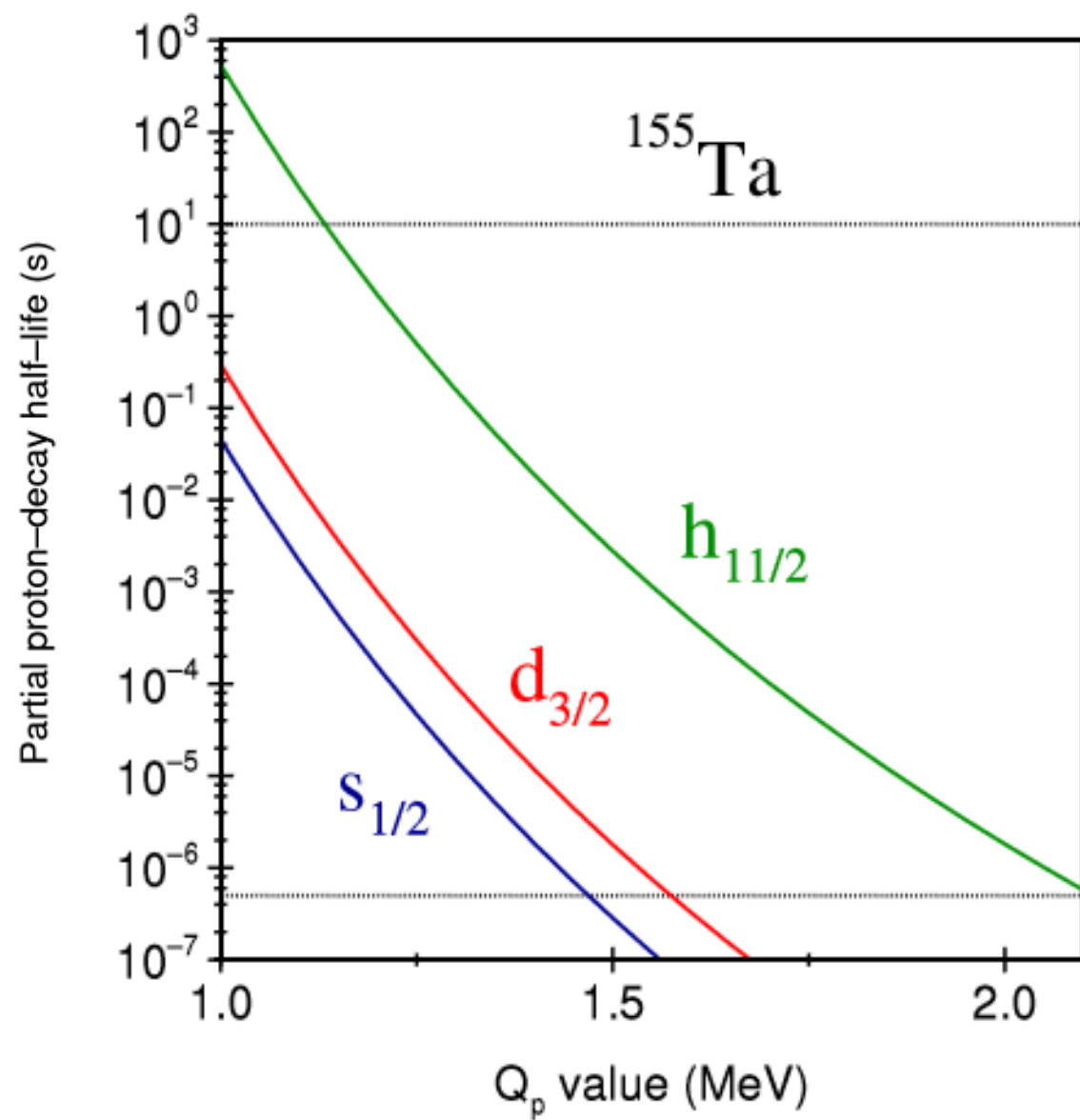
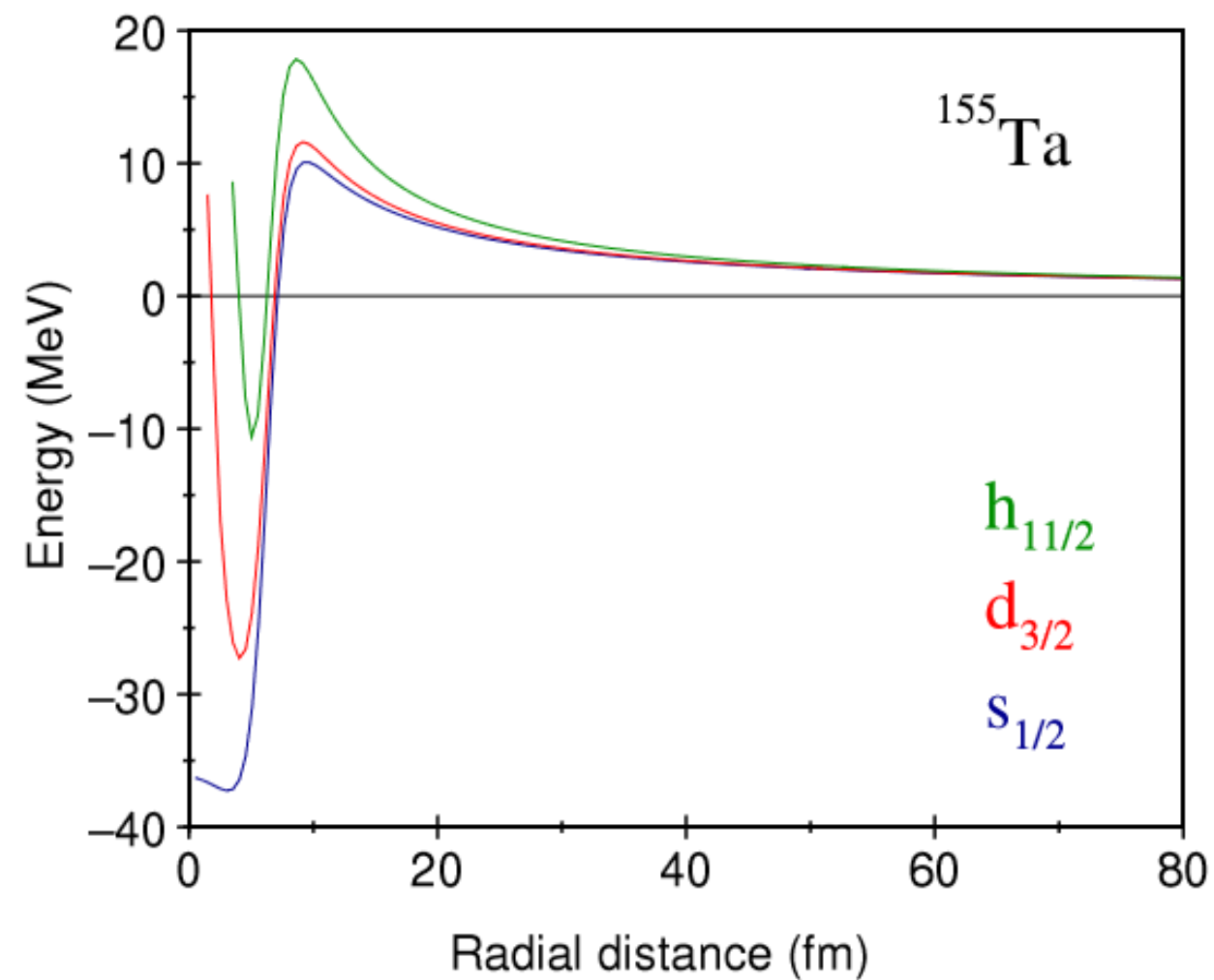
Adam McCarter

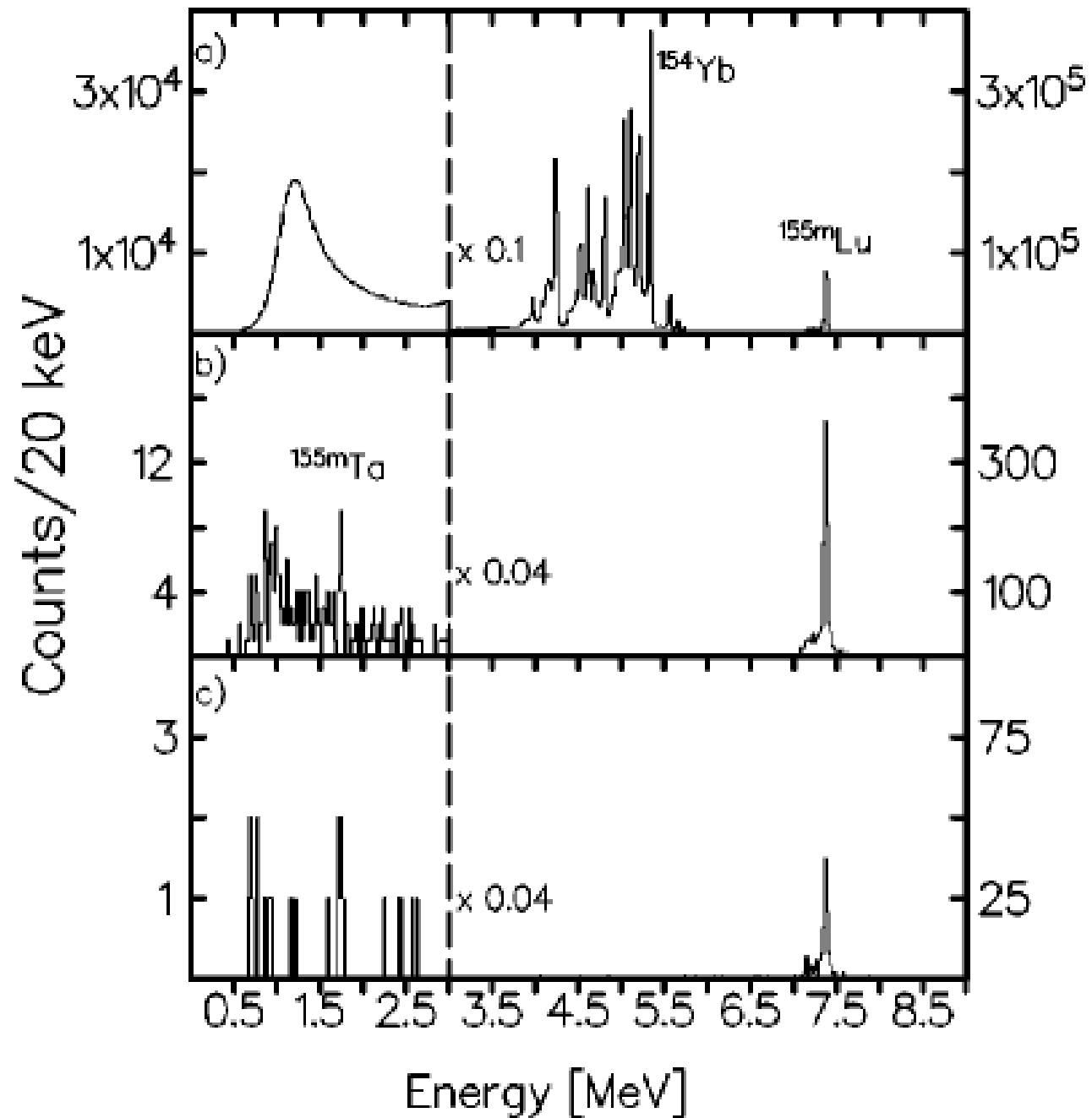
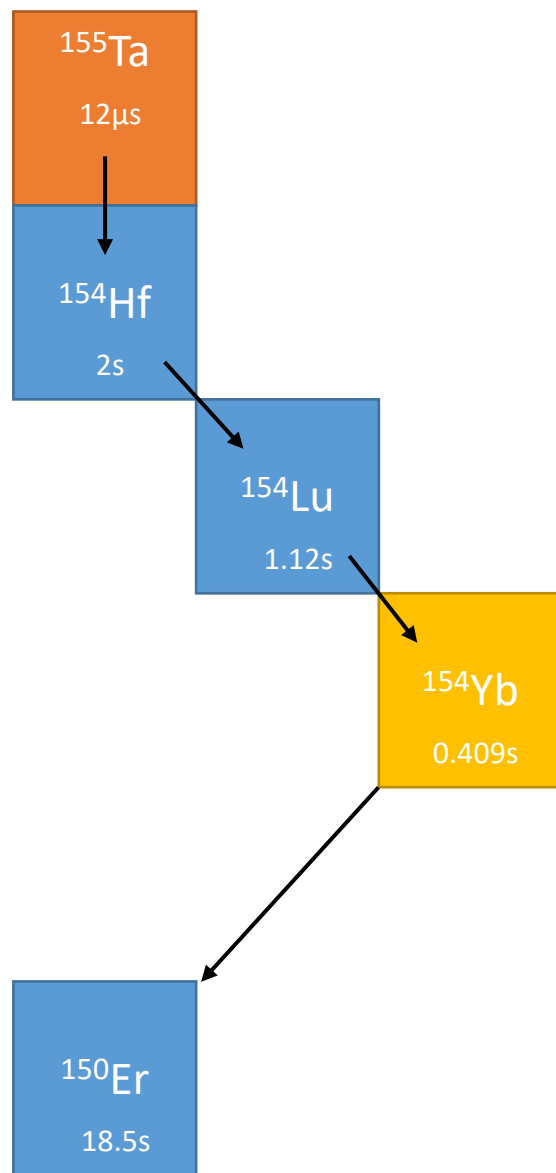


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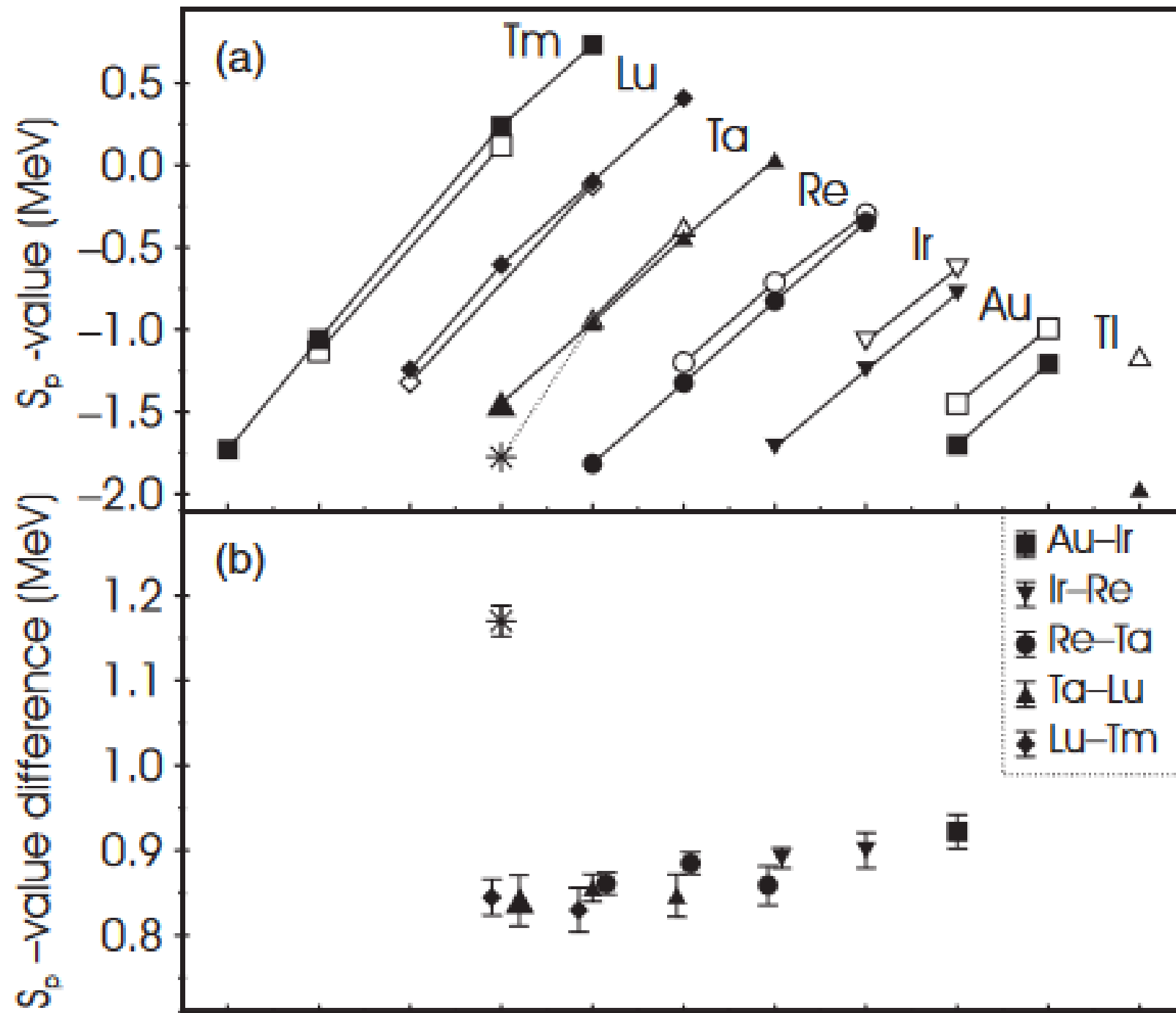




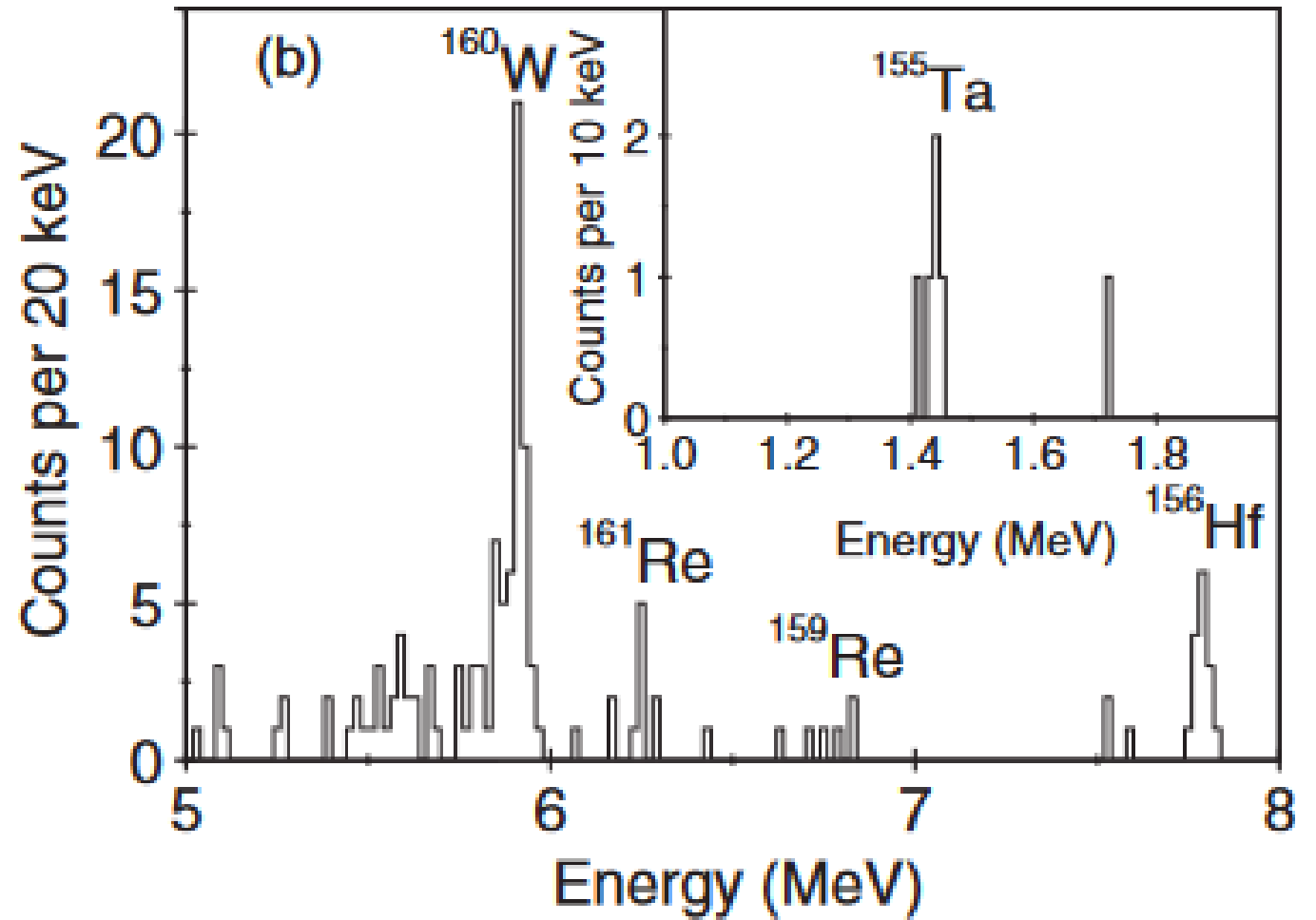
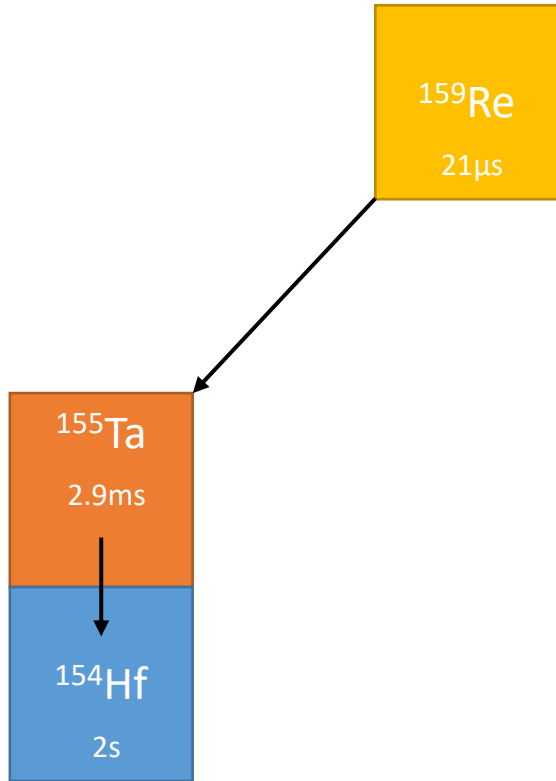


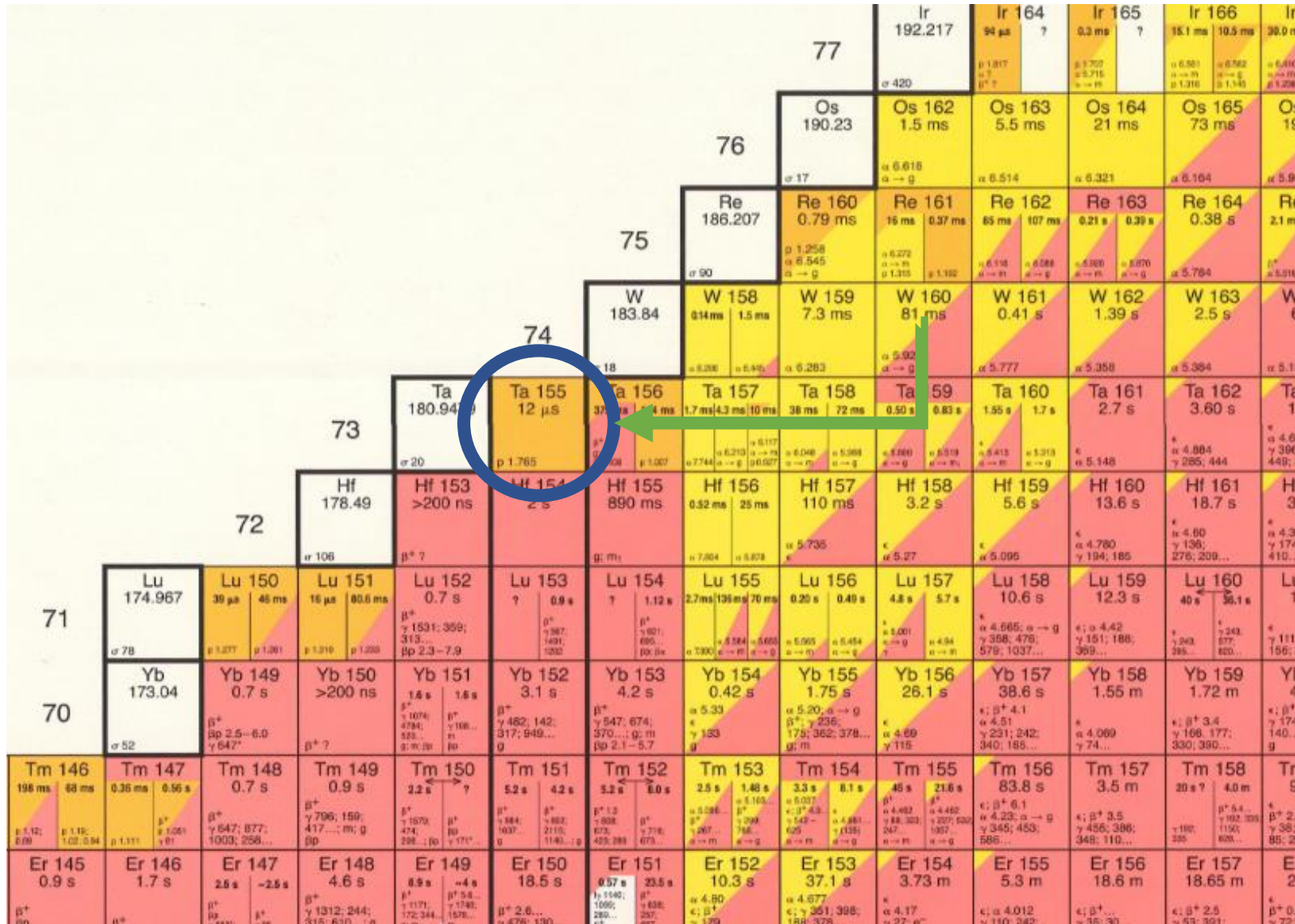






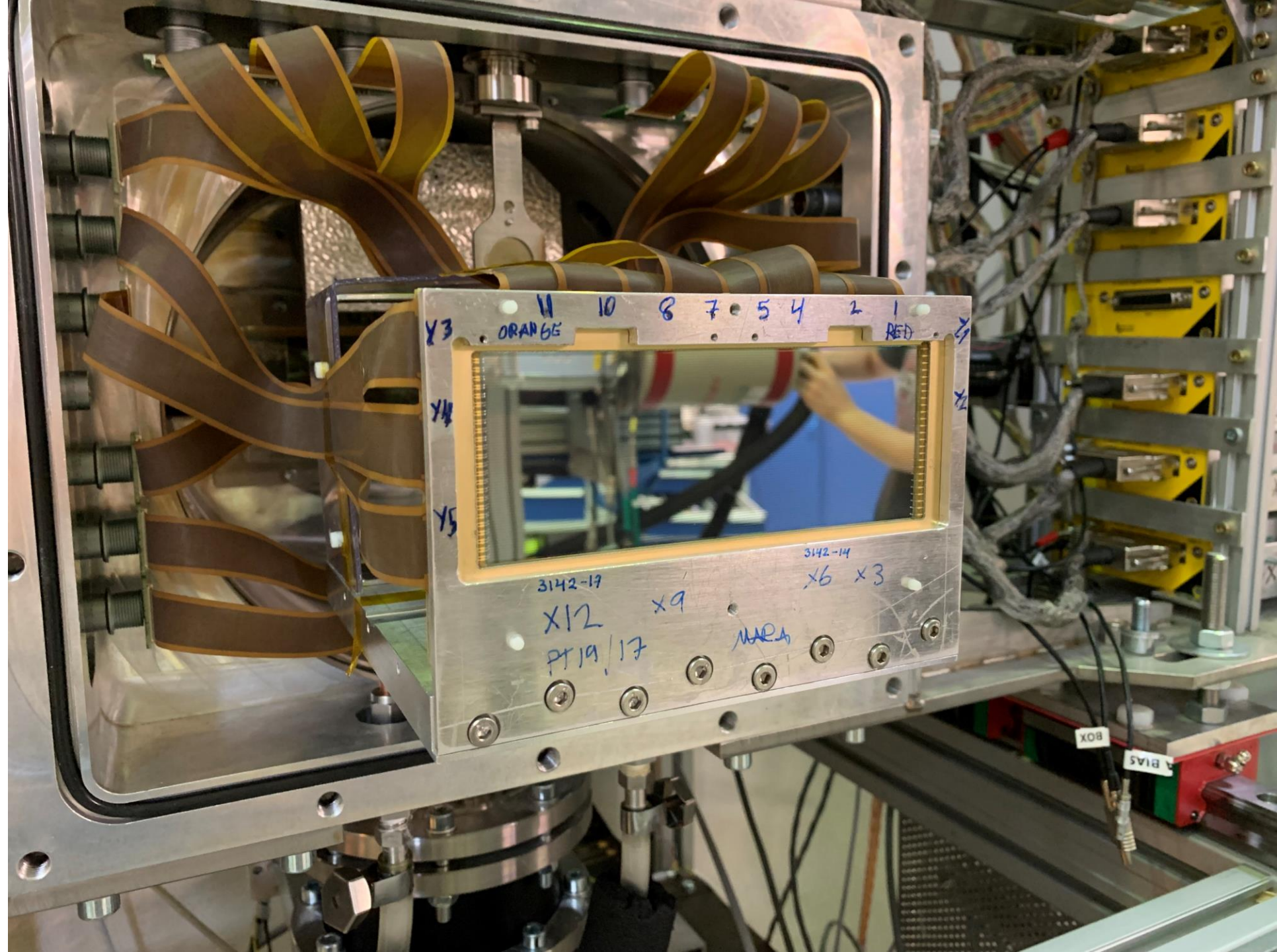
p  
β  
α





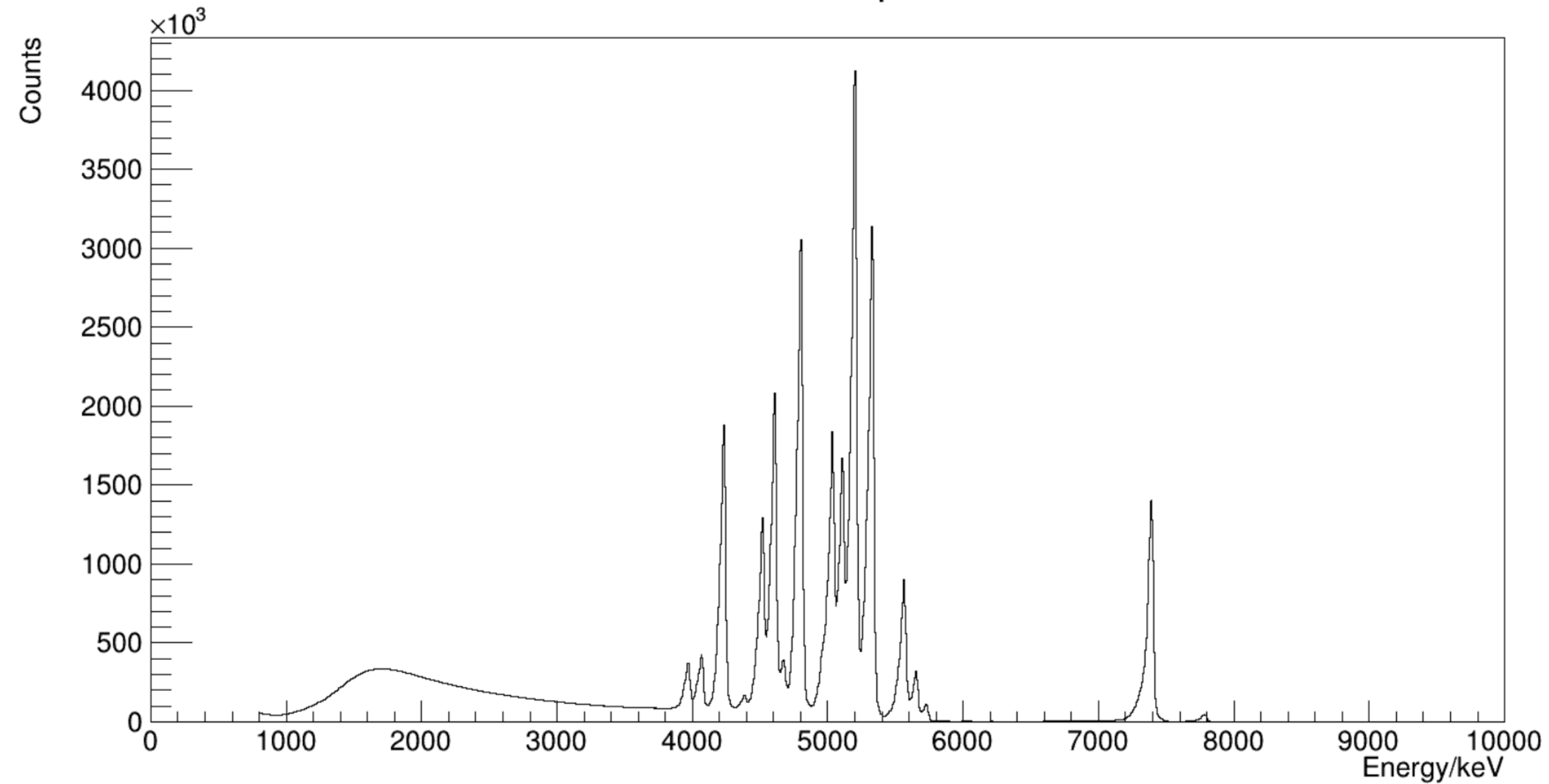


# DSSD

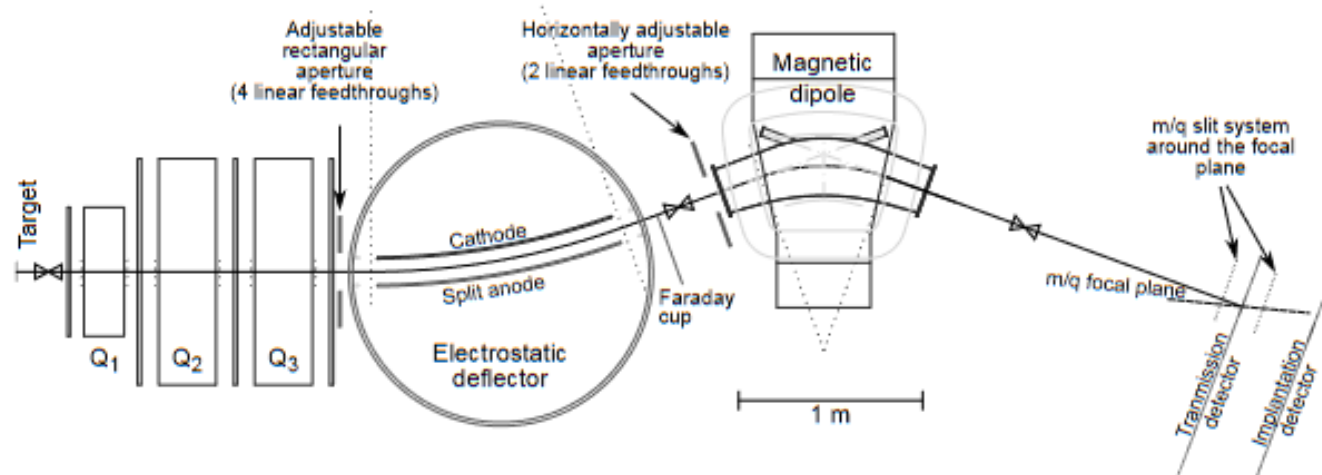
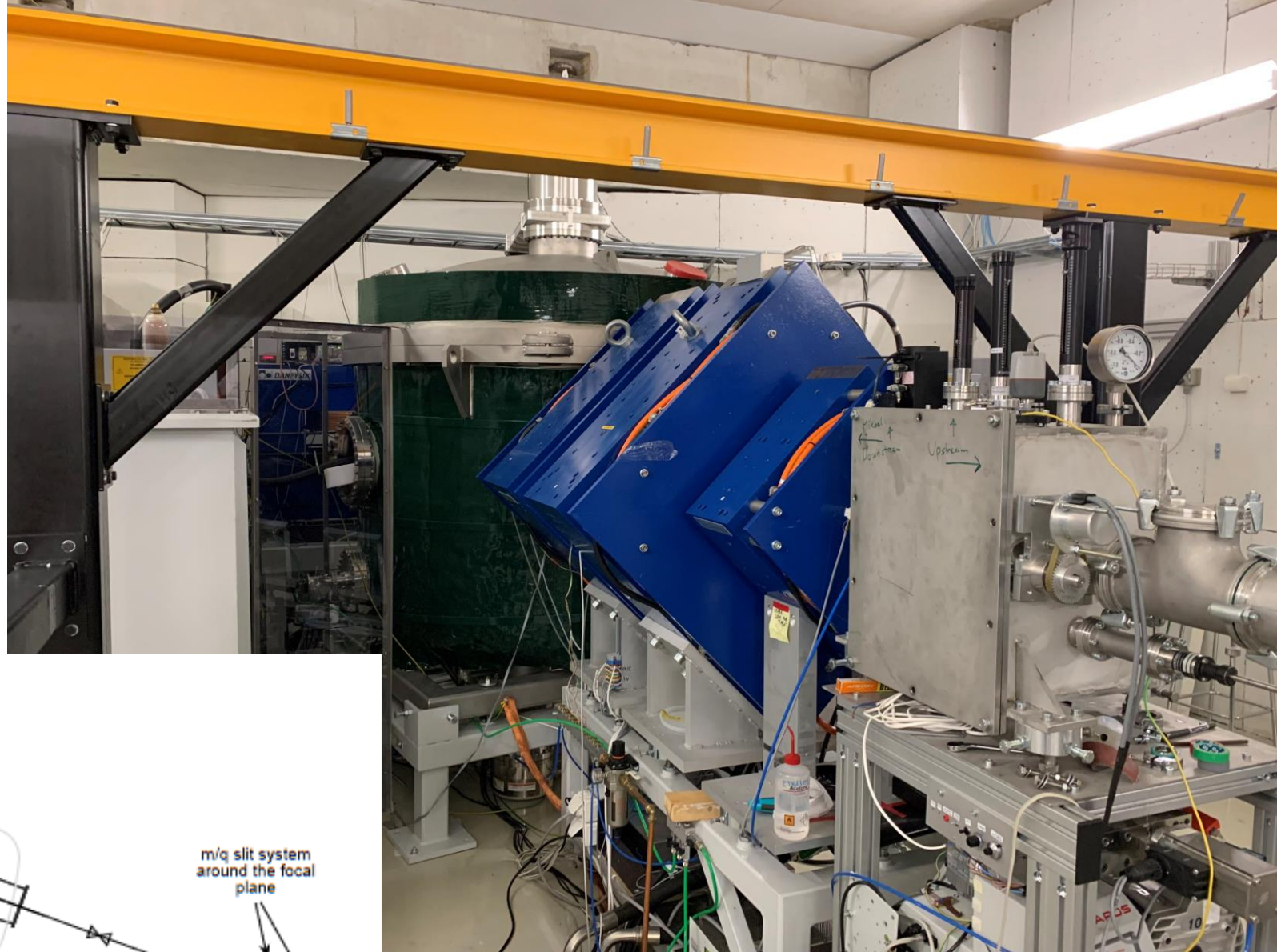




# Raw DSSD Spectrum

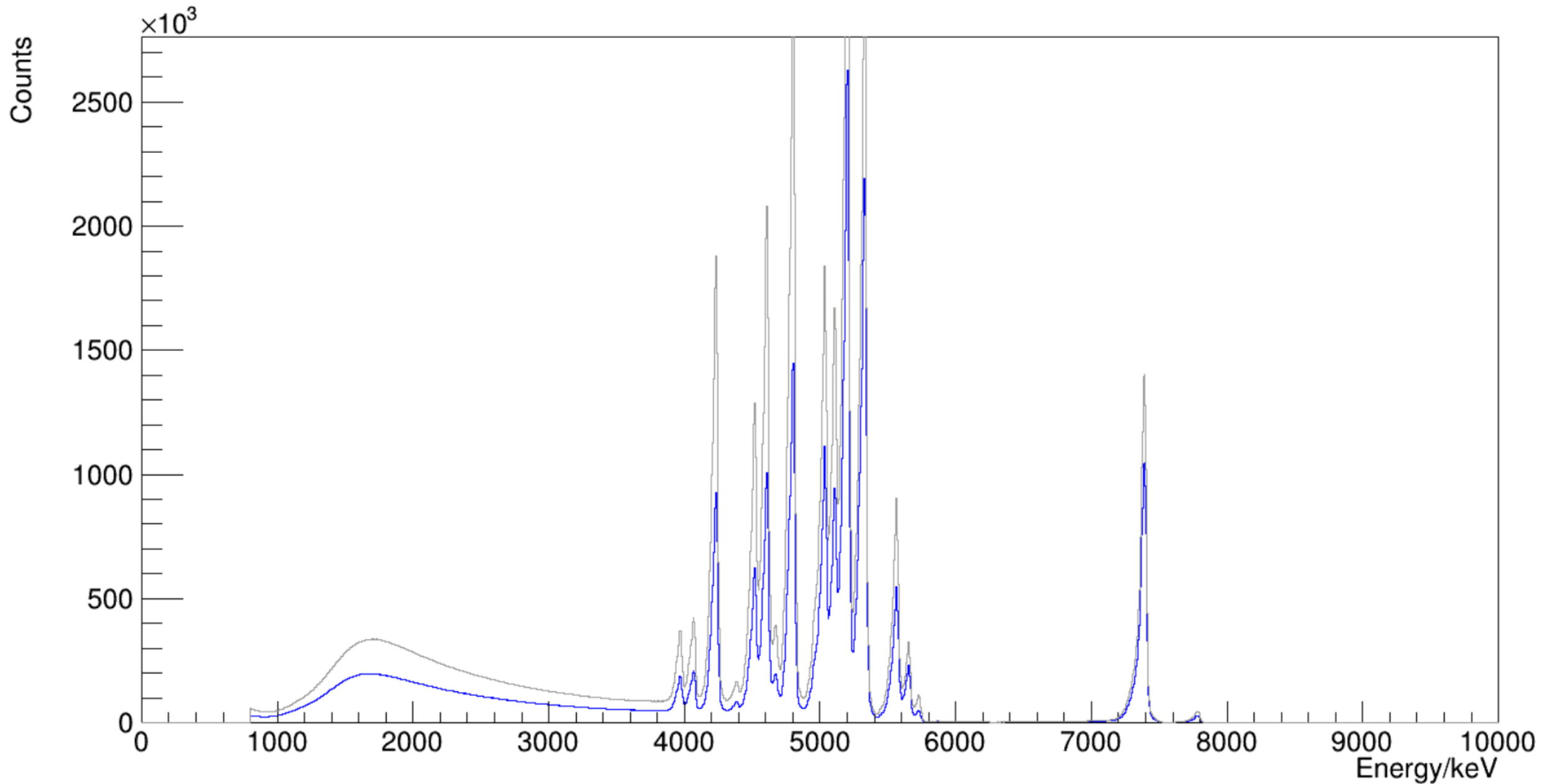


# MARA

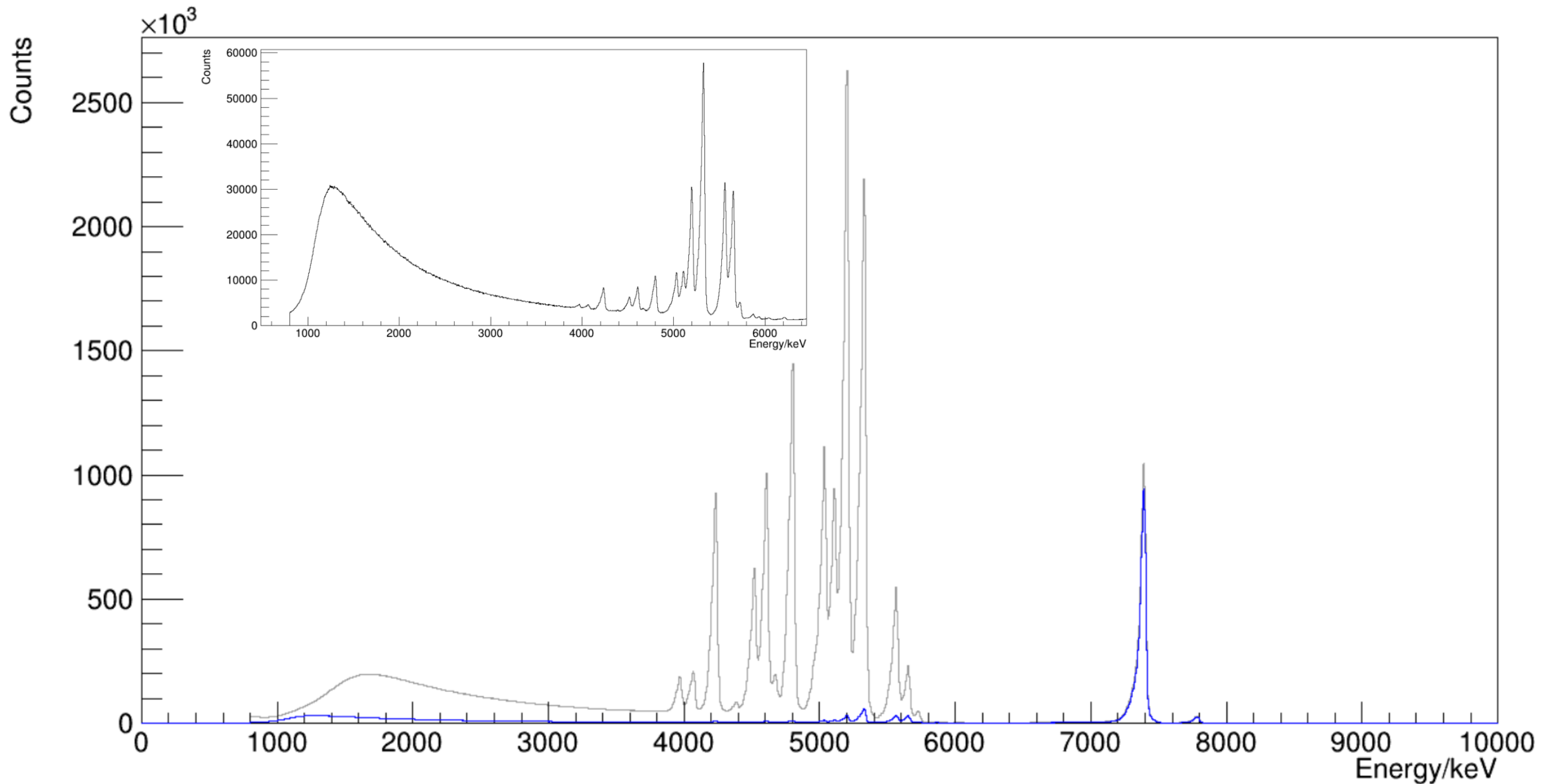




Comparison of Raw DSSD Spectrum (Grey) and Mass Gated DSSD Spectrum (Blue)

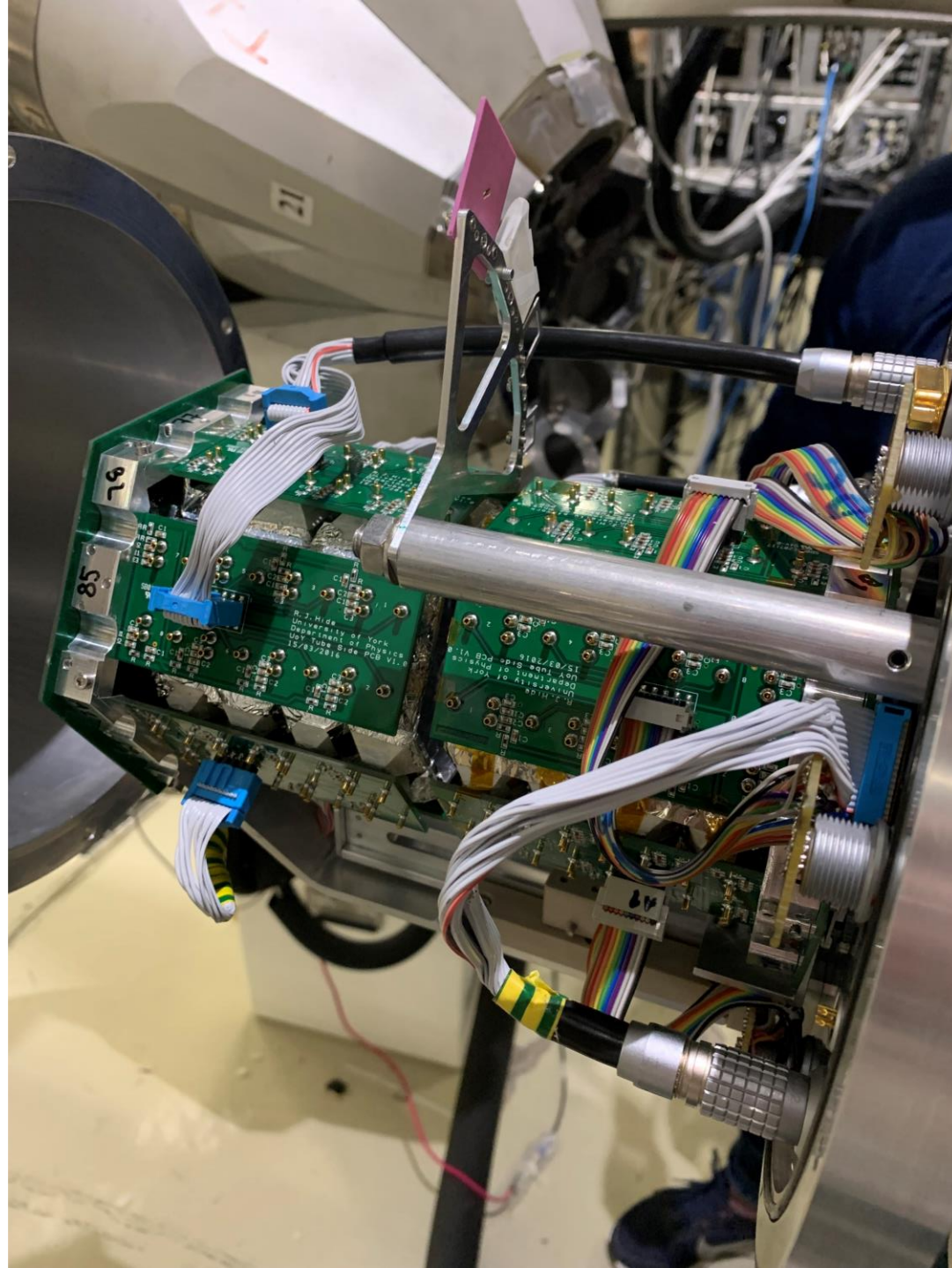


Comparison of Mass Gated DSSD Spectrum (Grey) and Mass + Time Gated DSSD Spectrum (blue)

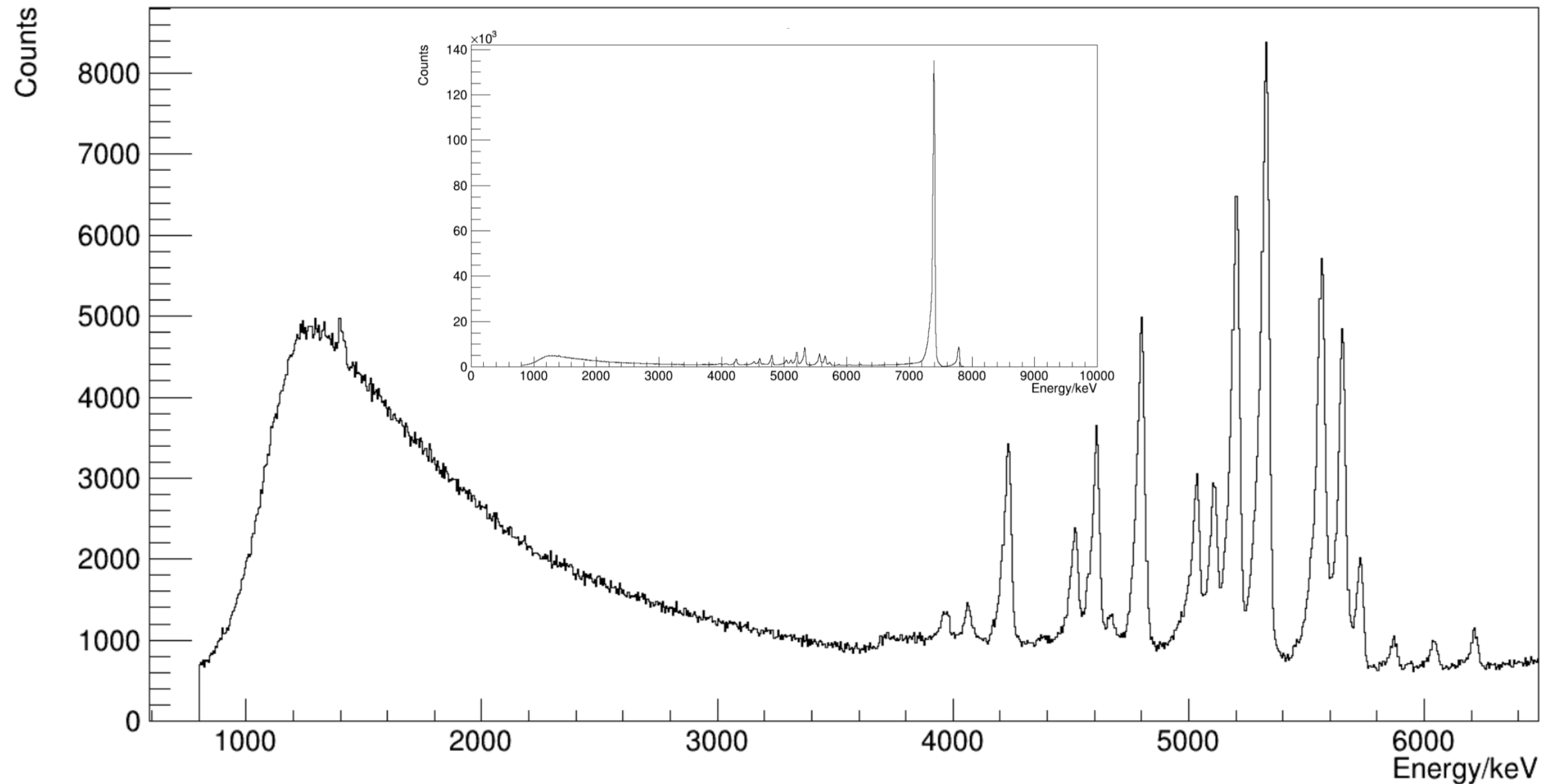




# JYTube

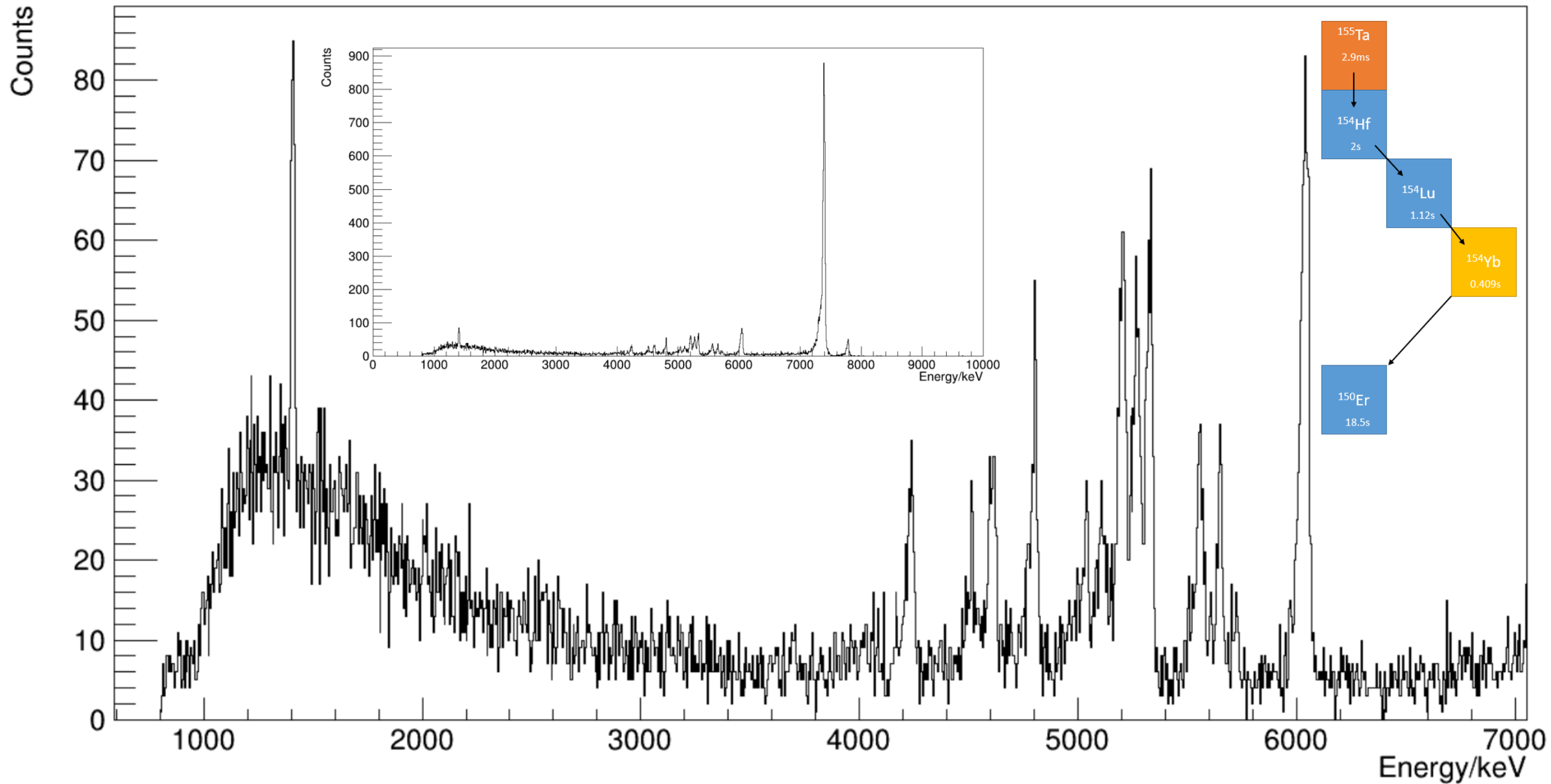


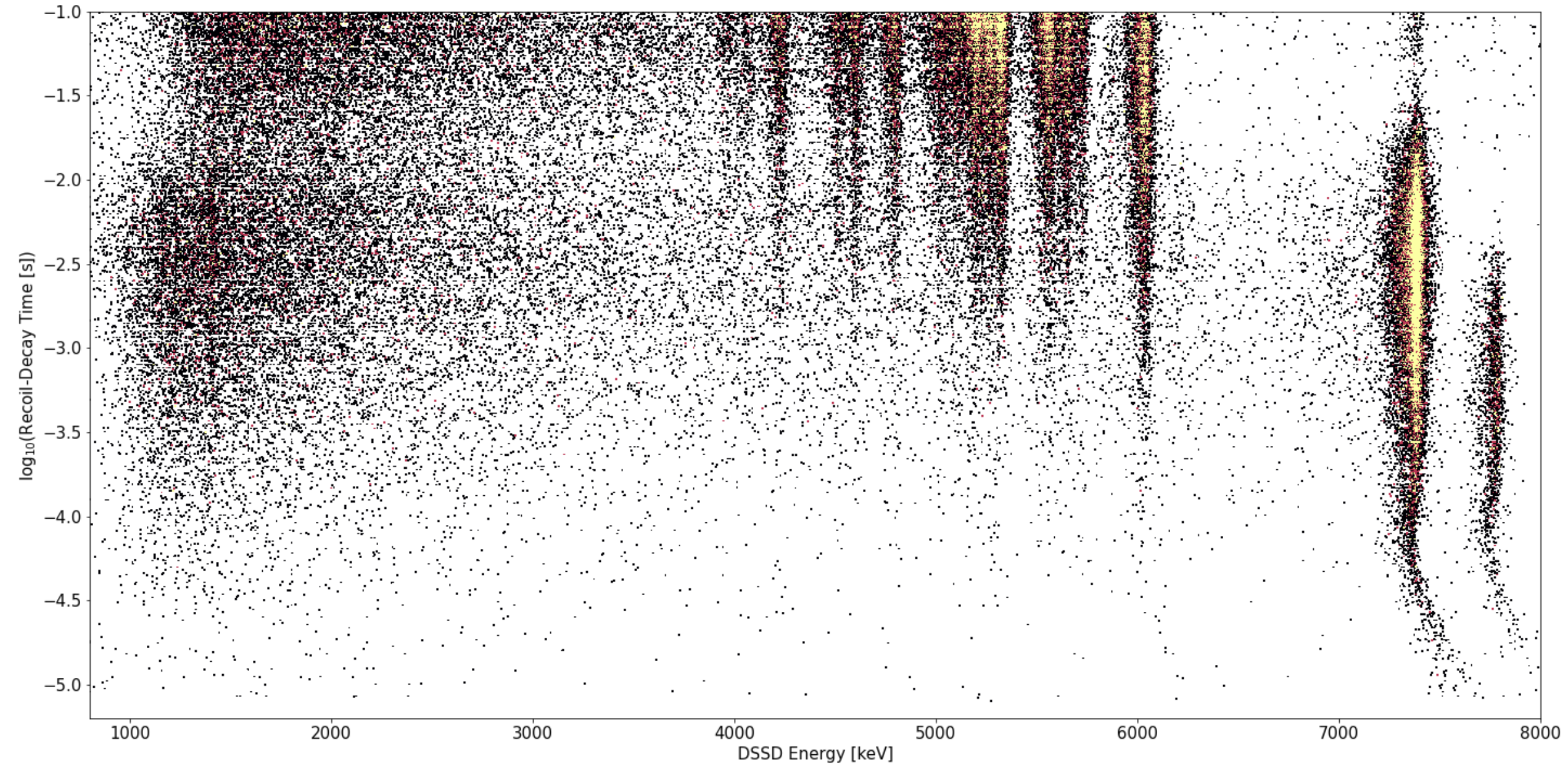
# Tube Fold < 2, Recoil-Decay time < 15ms, Mass = 155



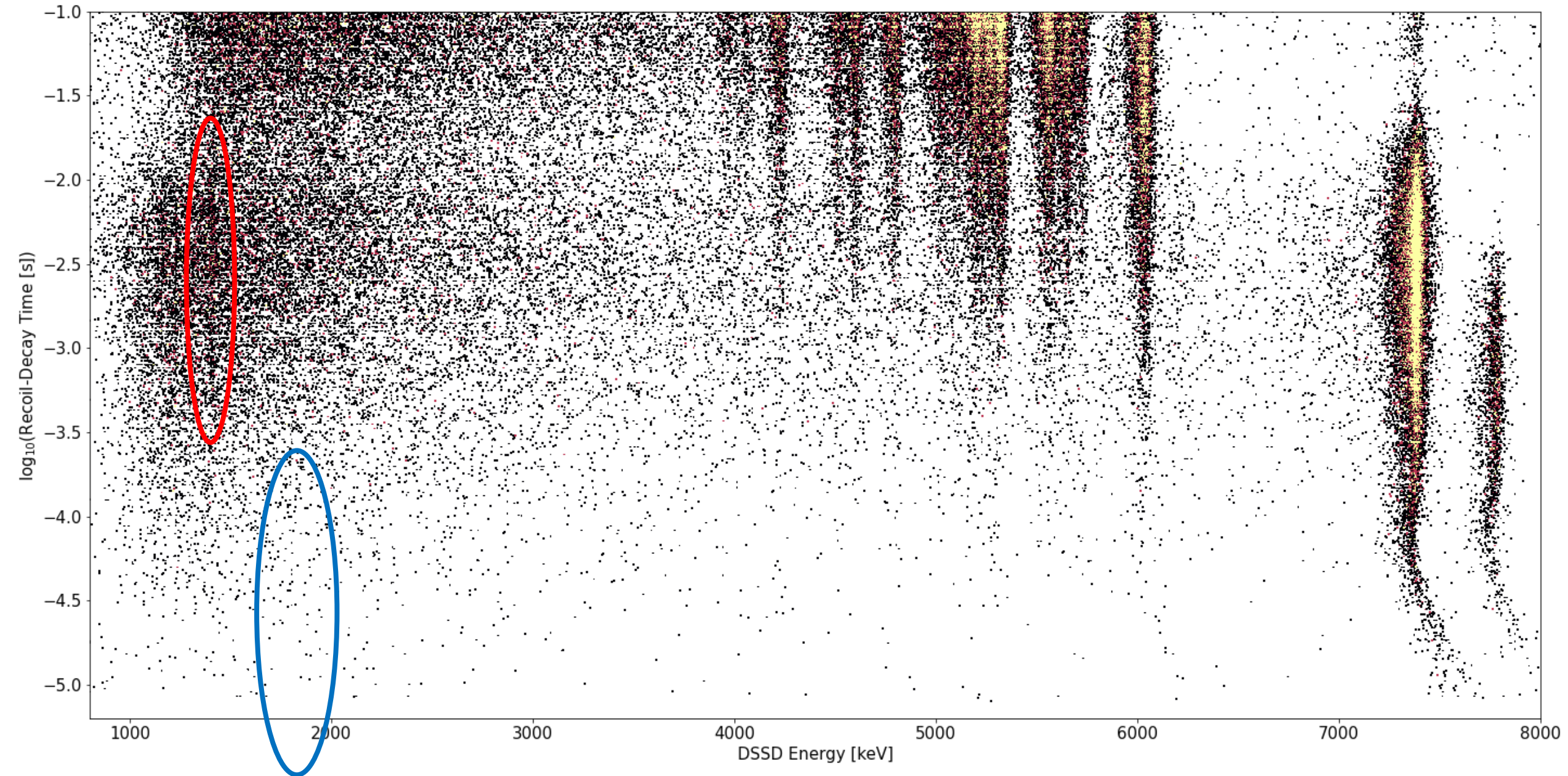


# Tube Fold < 2, Recoil-Decay time < 15ms, Mass = 155, Followed by $^{154}\text{Yb}$ Alpha







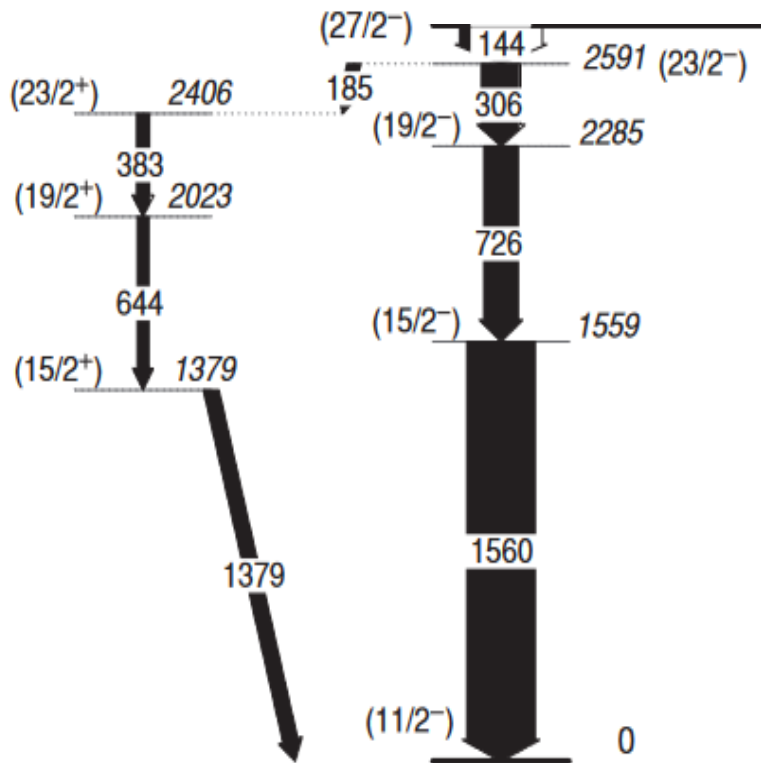




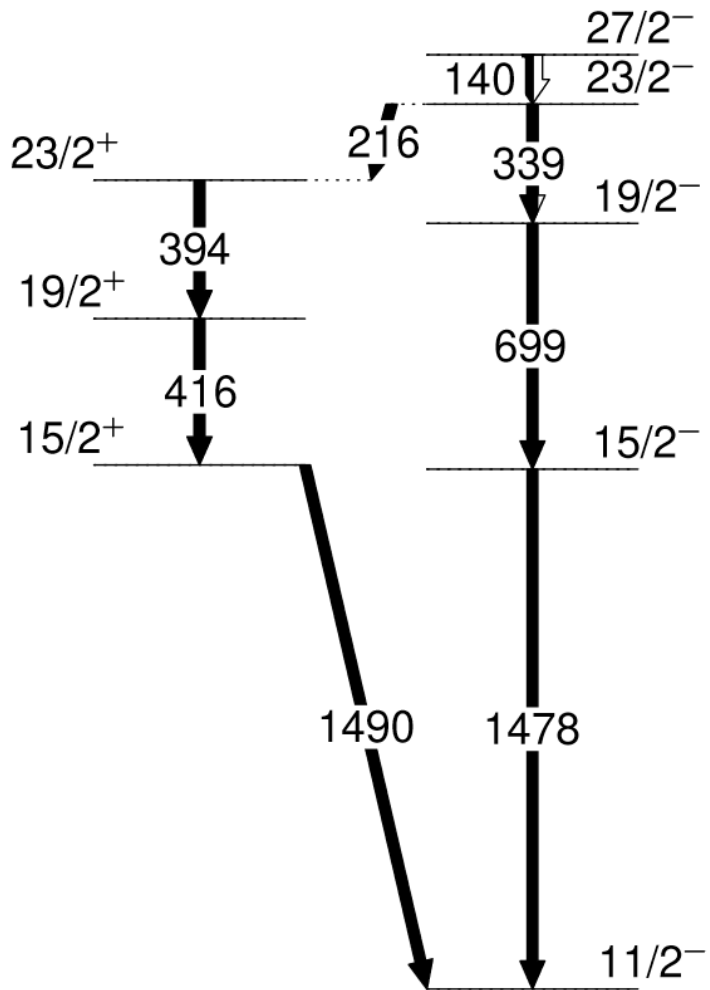
# Focal Plane Germanium Array



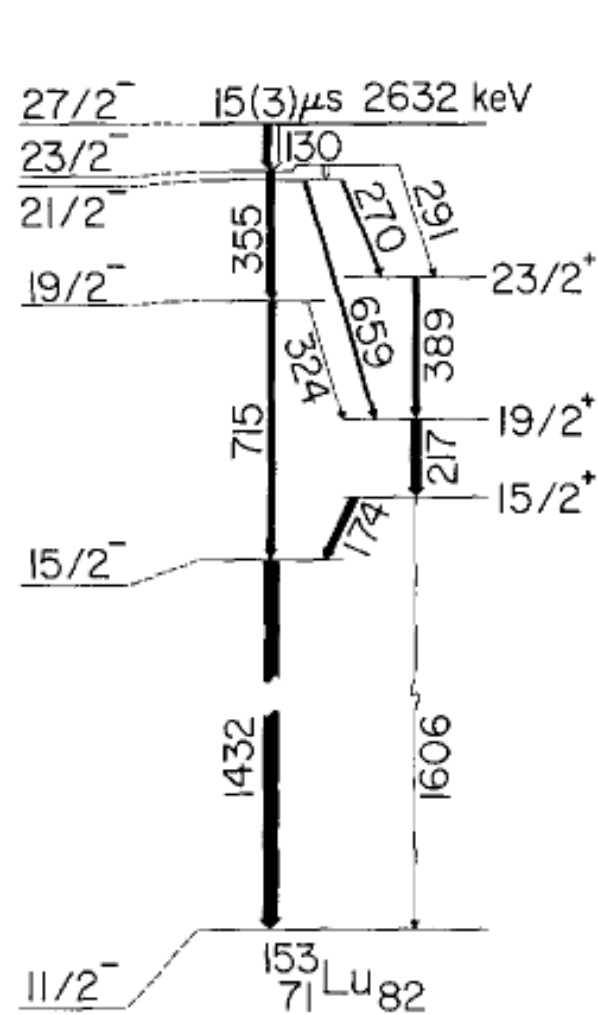
$^{149}\text{Ho}$



$^{151}\text{Tm}$

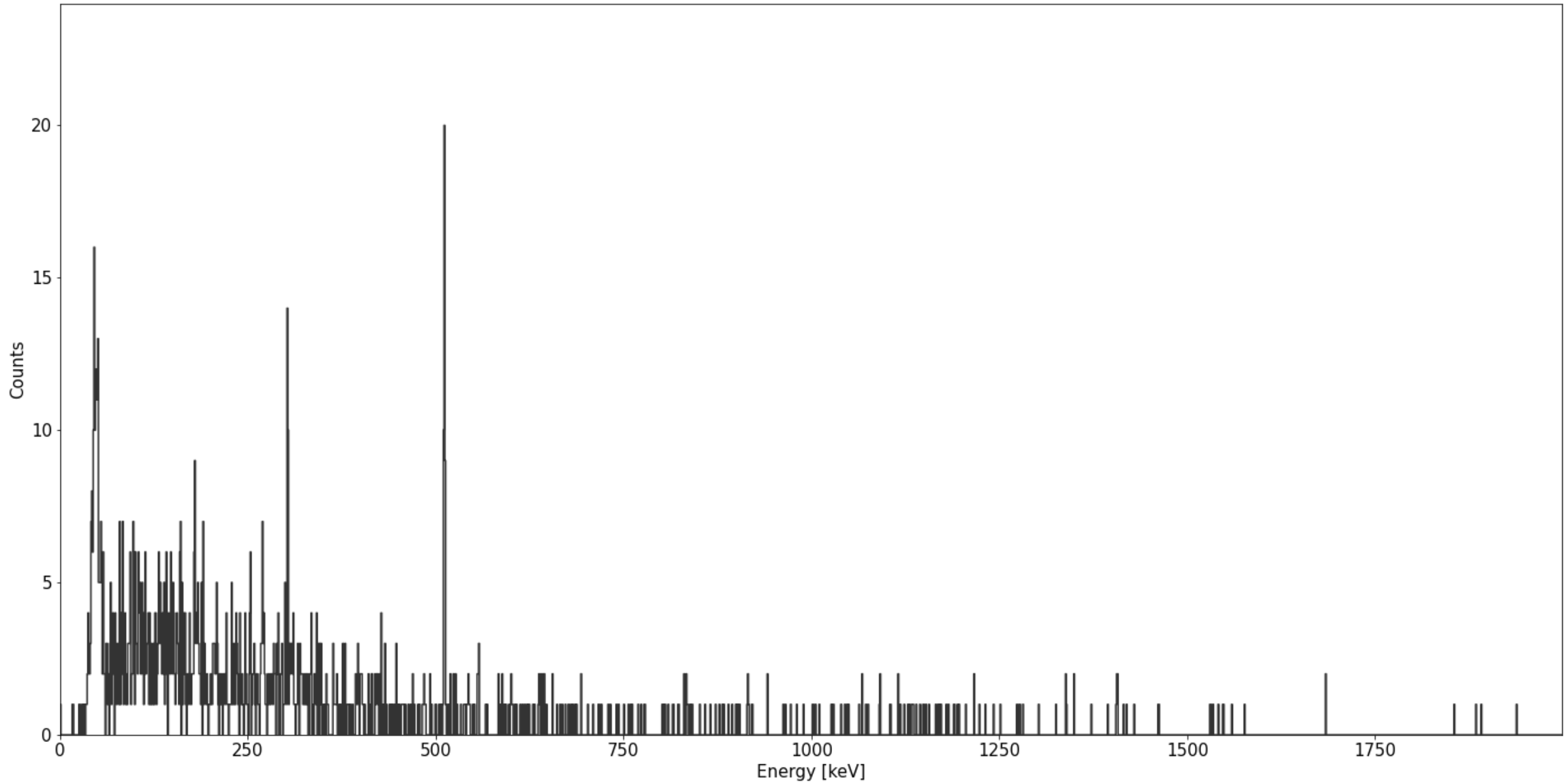


$^{153}\text{Lu}$



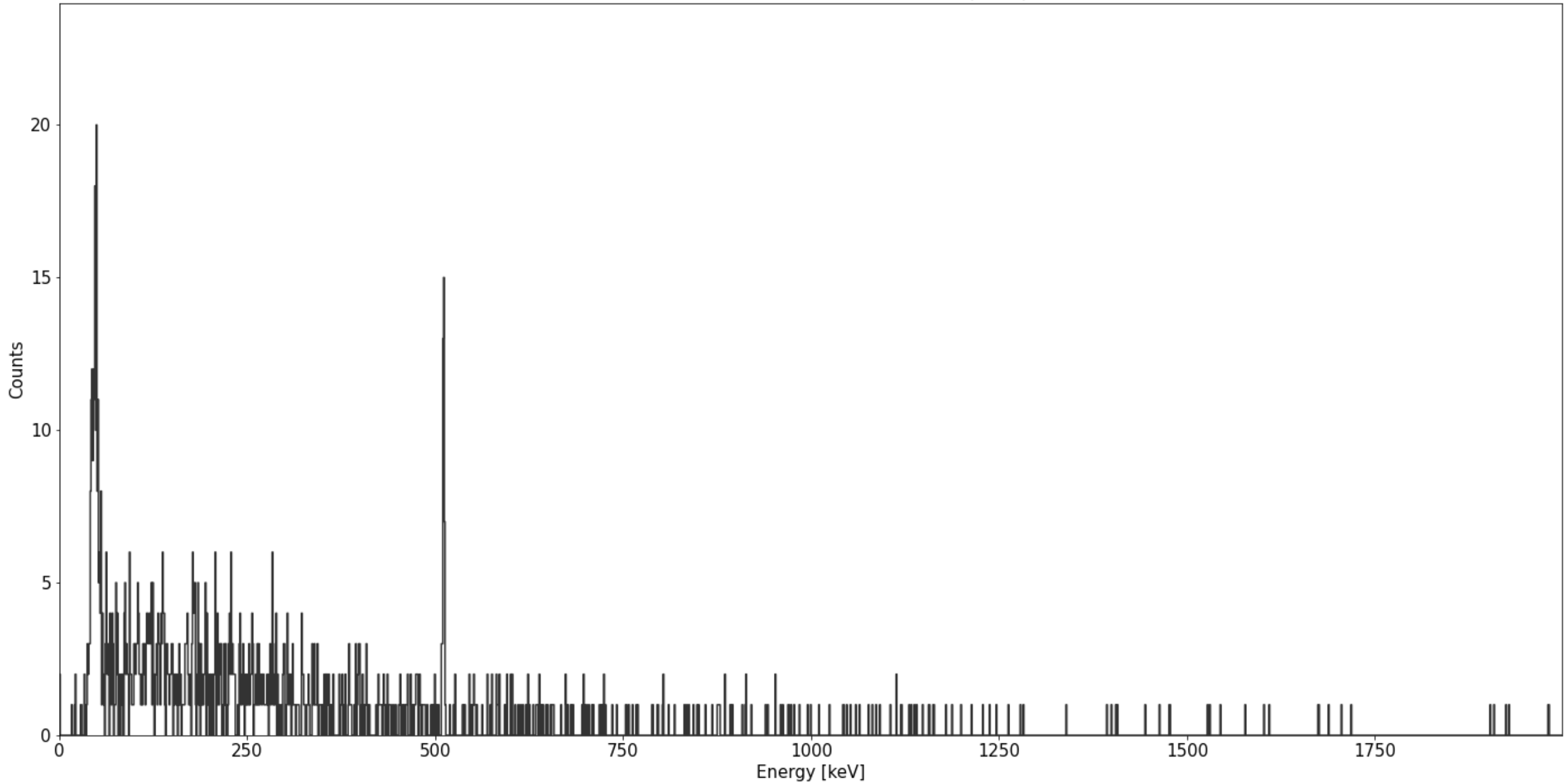
N=82 Isomers

Gammas in Coincidence with  $^{155}\text{Ta}$  Protons

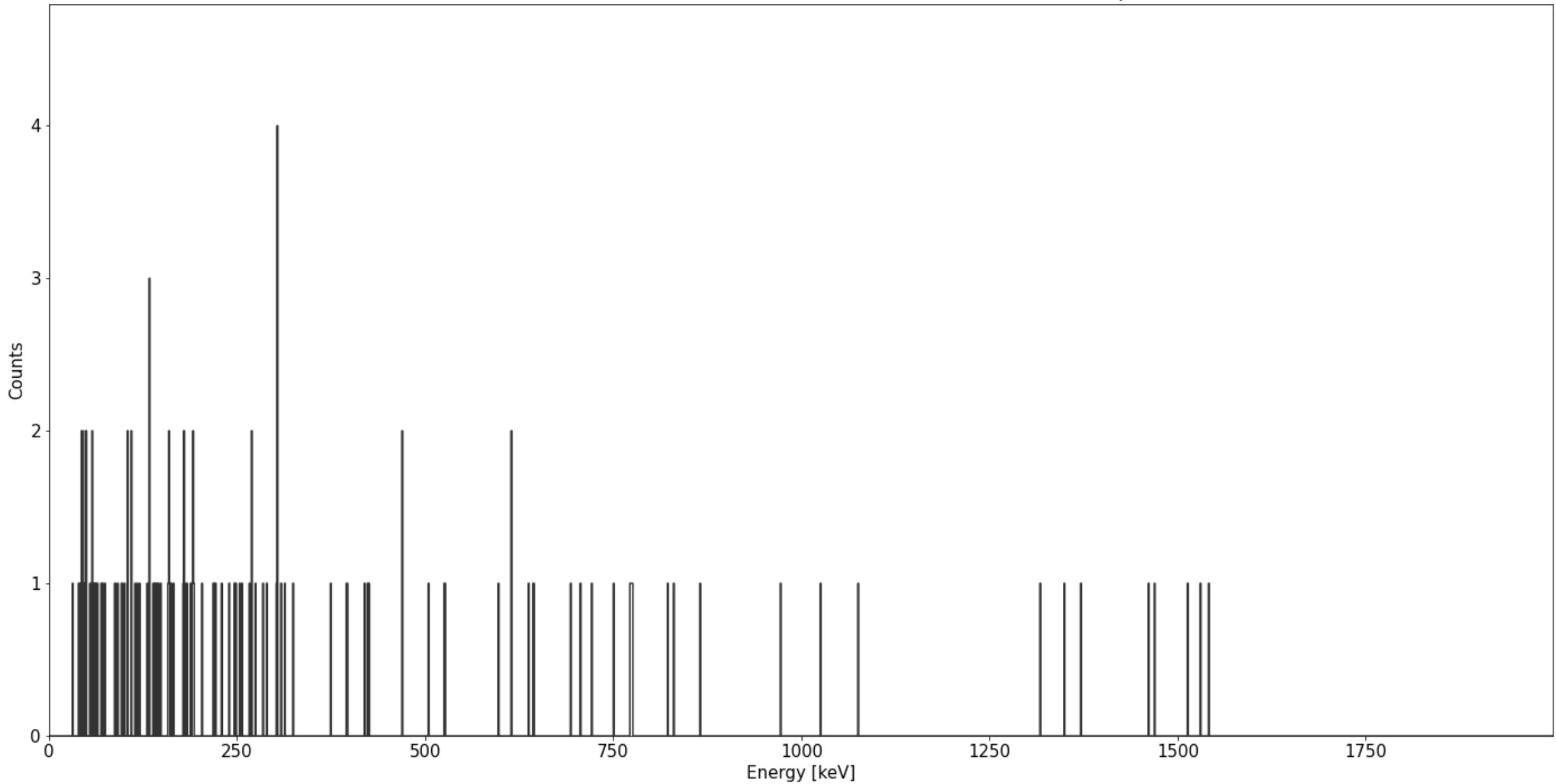




Gammas in Coincidence with  $^{155m}\text{Lu}$  Escape Alphas



Gammas in Coincidence with  $^{155}\text{Ta}$  Protons Correlated with  $^{154}\text{Yb}$  Alphas



# Conclusion

- Direct production of proton-emitting state in  $^{155}\text{Ta}$ .
- Consistent with production following  $^{159}\text{Re}$  alpha decays.
- No obvious sign of short-lived proton reported by Uusitalo et al.
- Evidence of  $\mu\text{s}$  isomer.



# Thanks!

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