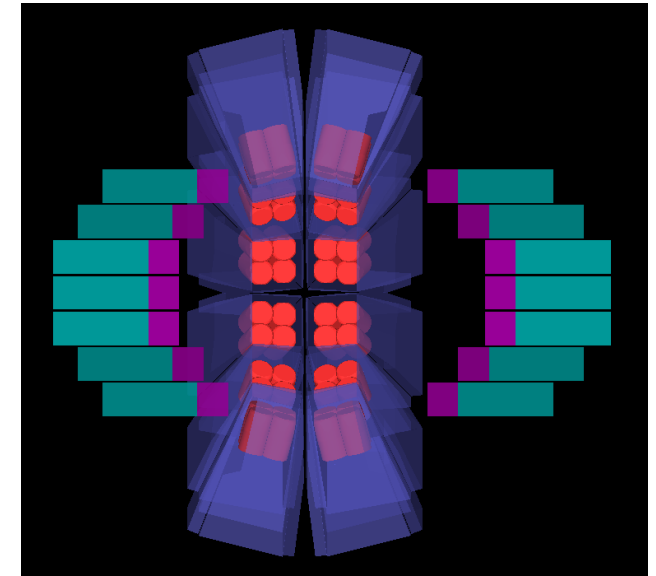
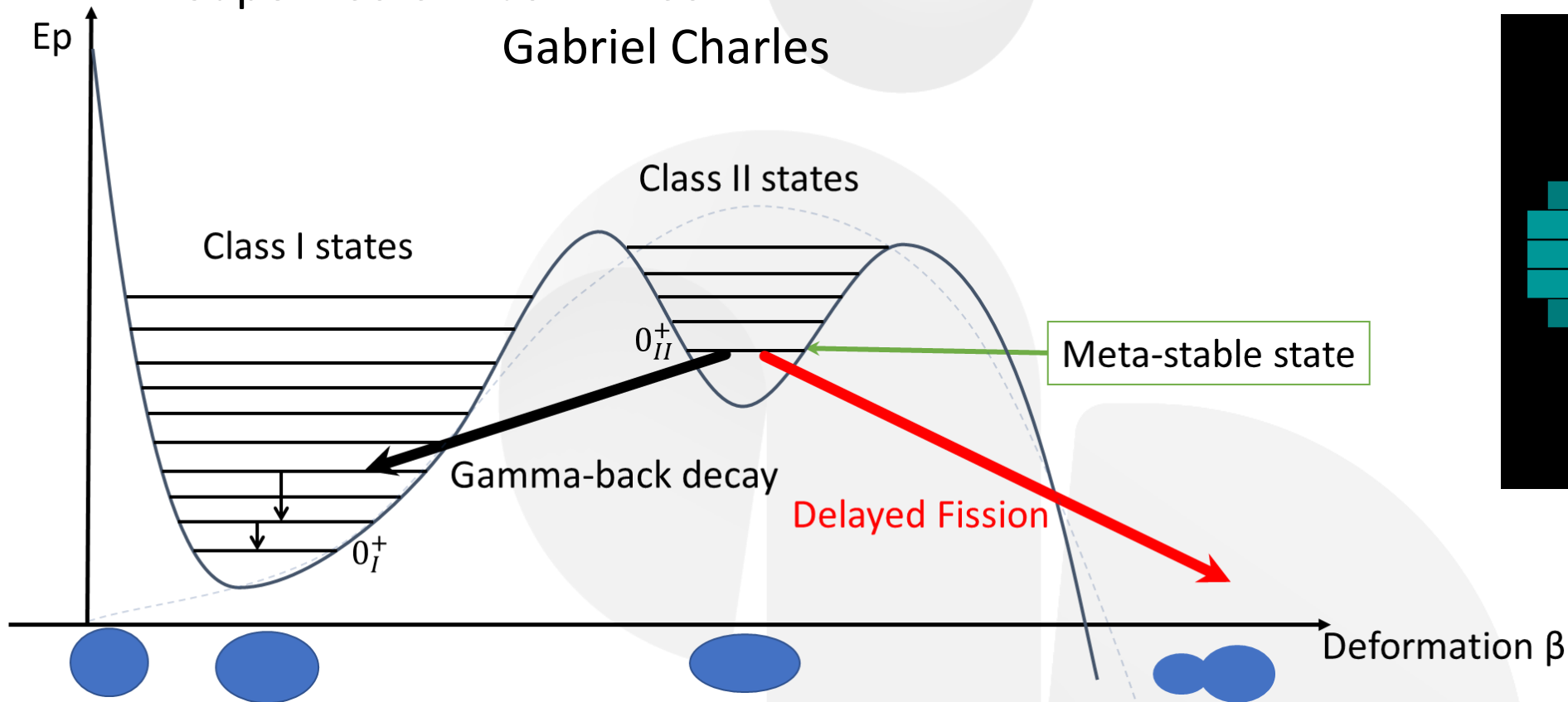


Studies of fission shape isomers in actinides with Nuball2

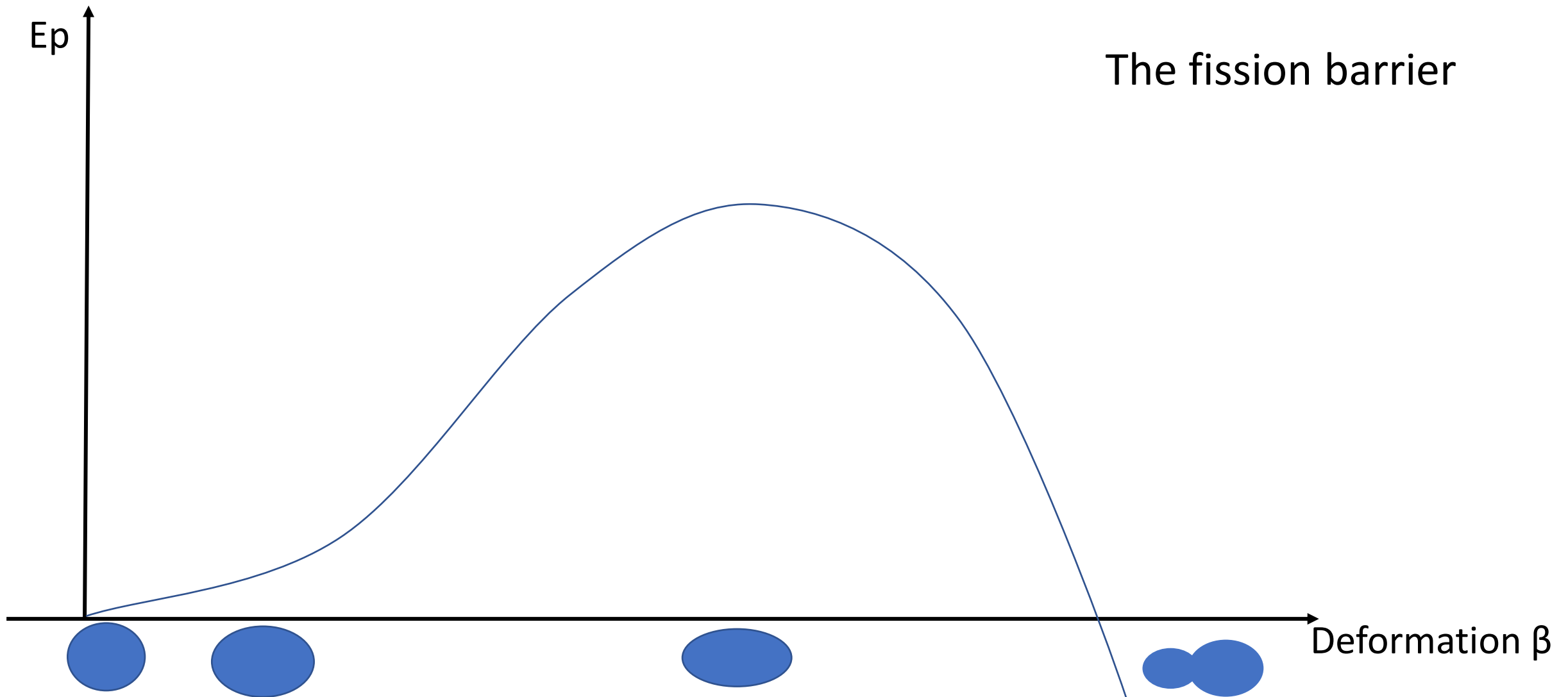
Supervisors : Jon Wilson

 Gabriel Charles



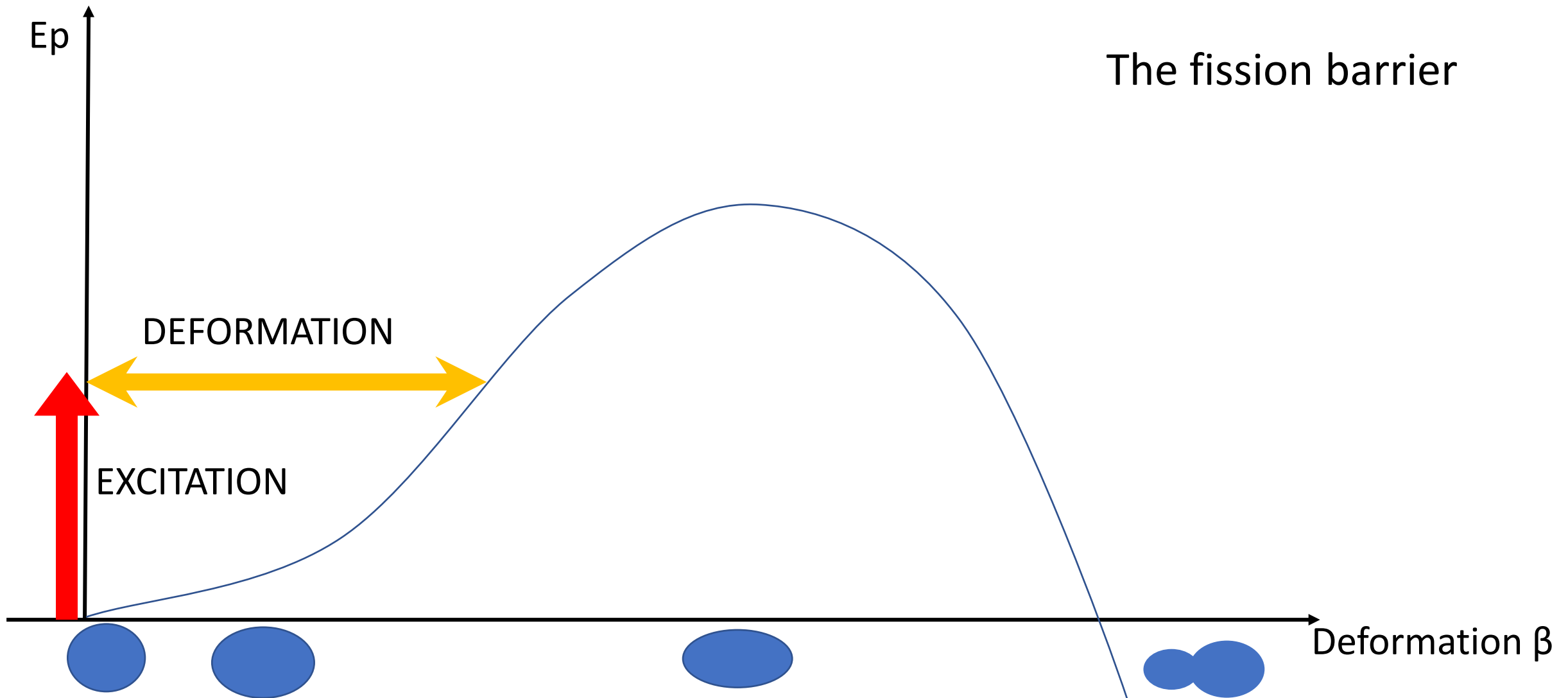


1.0 The basics of fission



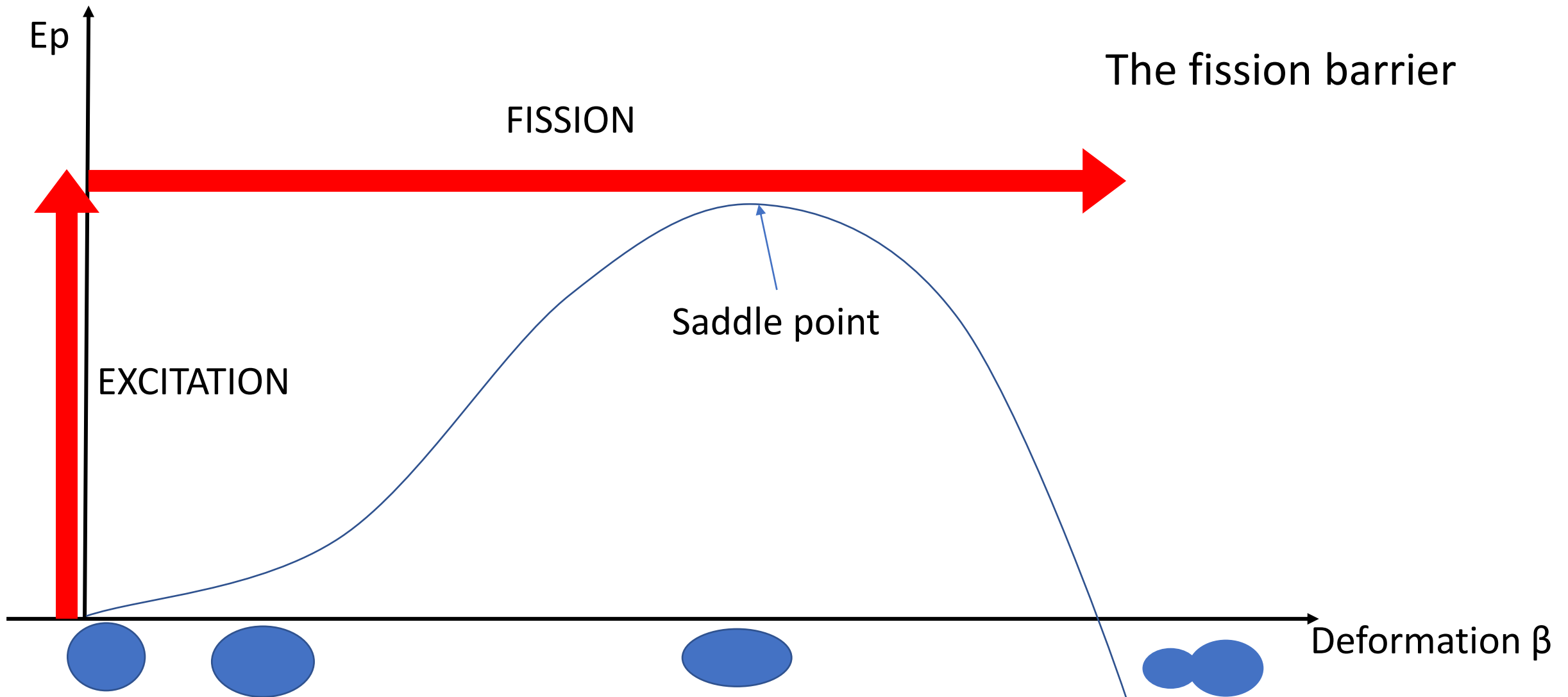


1.0 The basics of fission



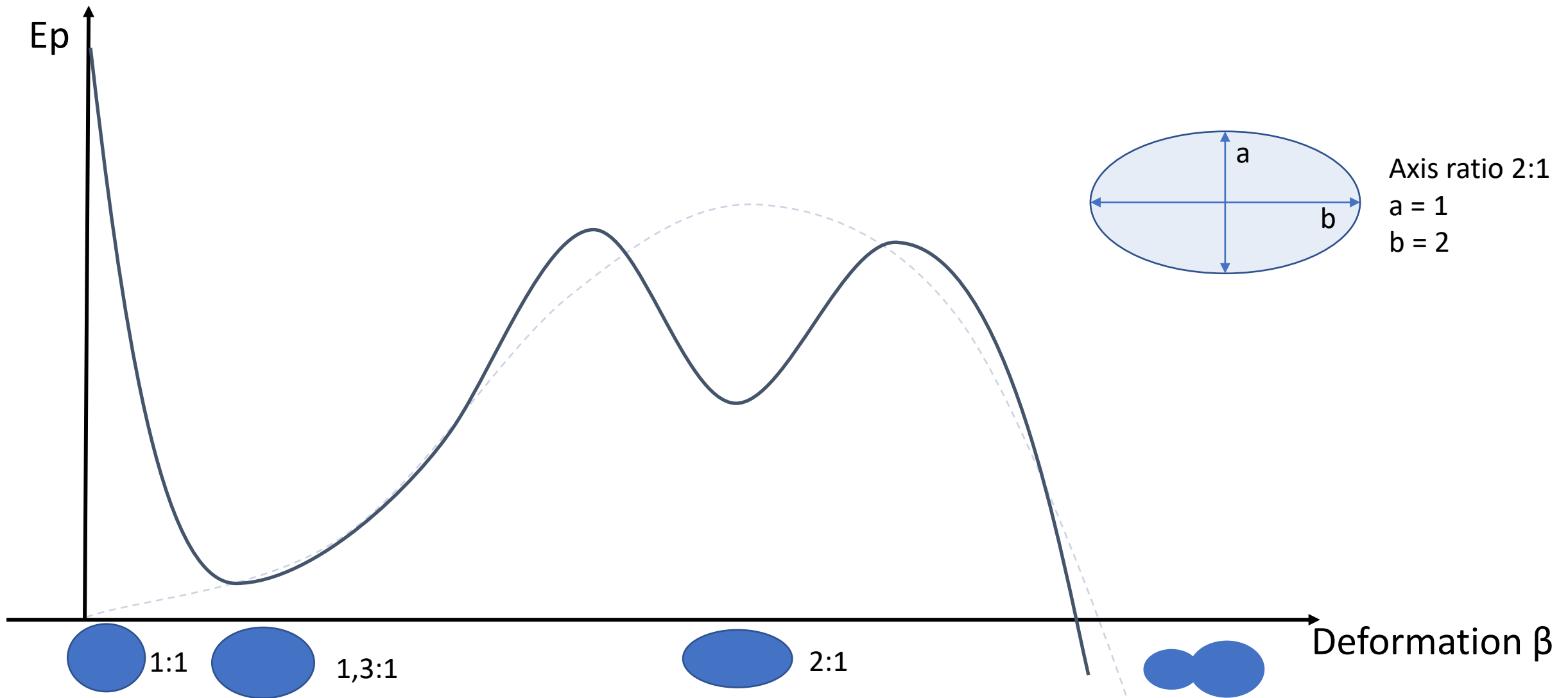


1.0 The basics of fission



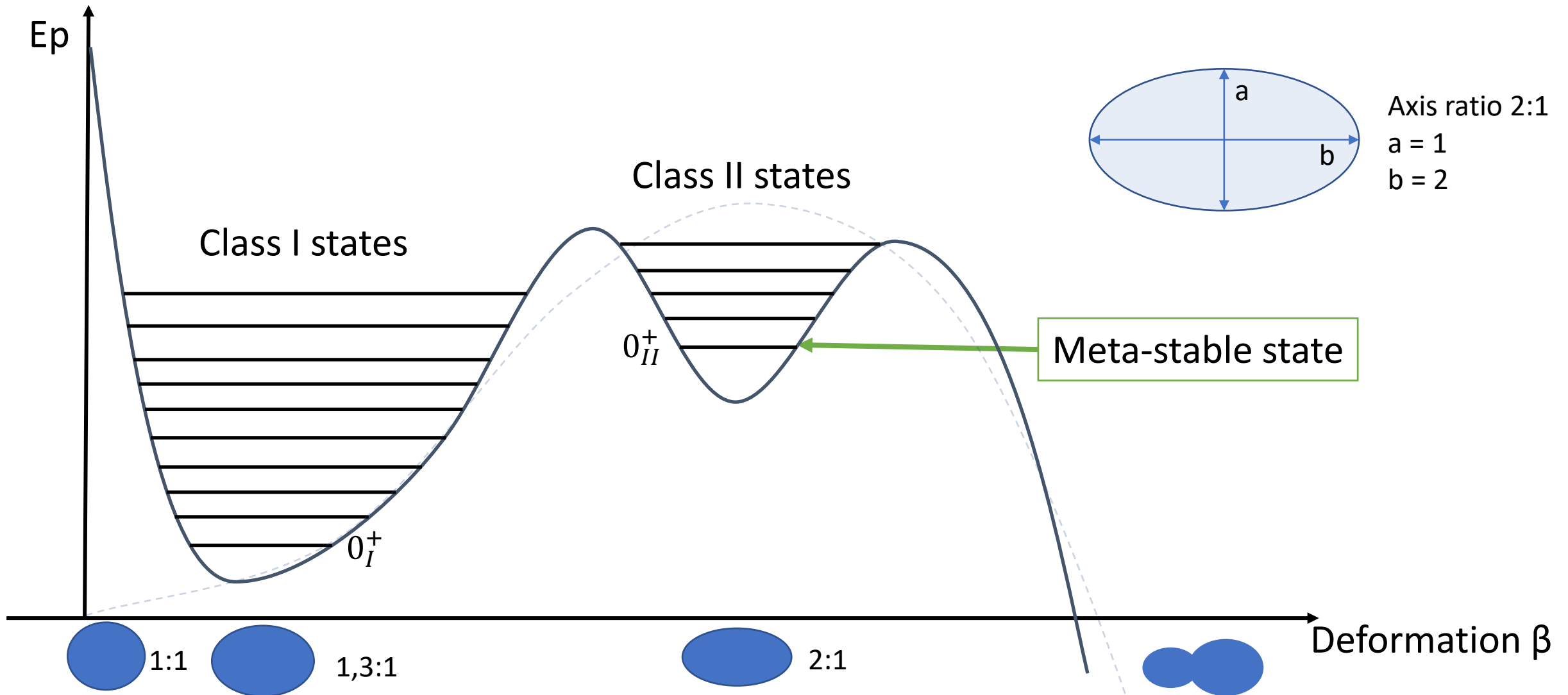


1.1 Fission shape isomers



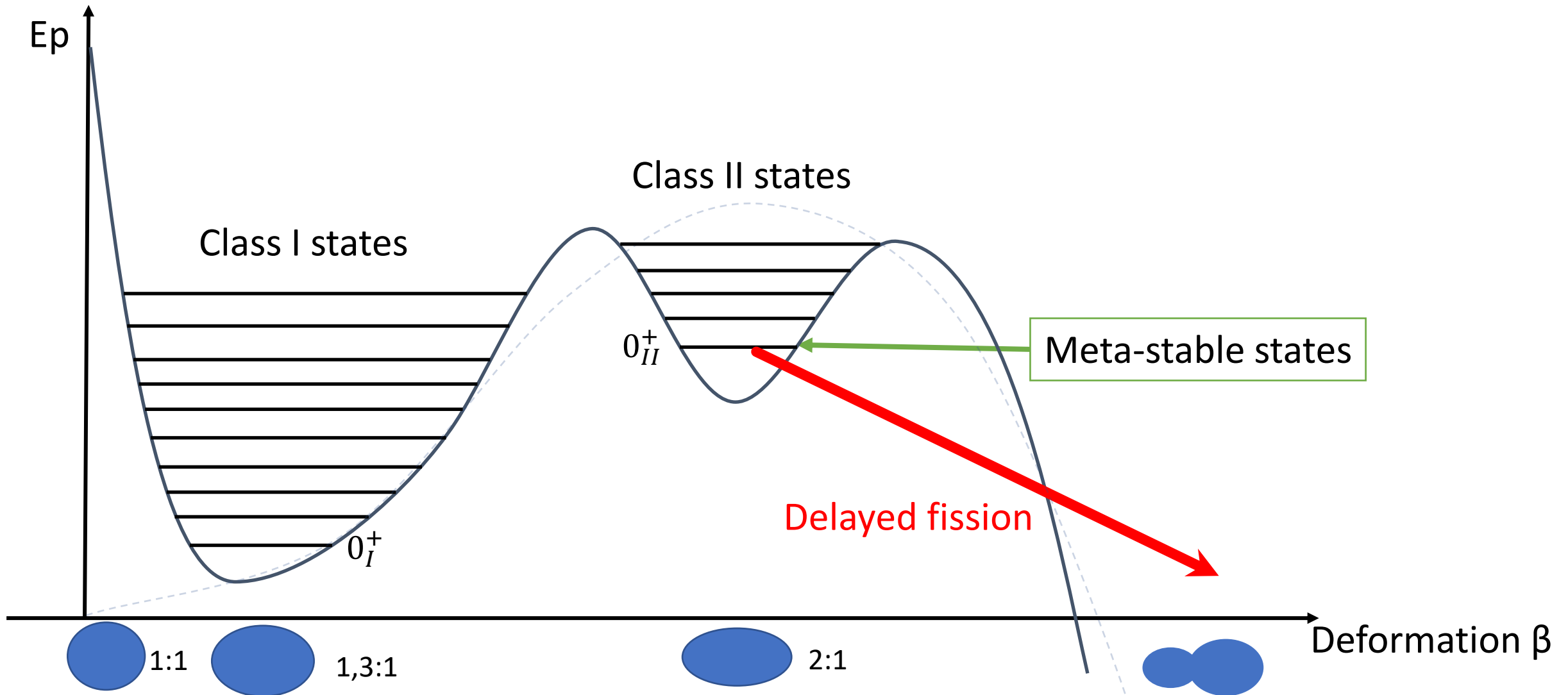


1.1 Fission shape isomers



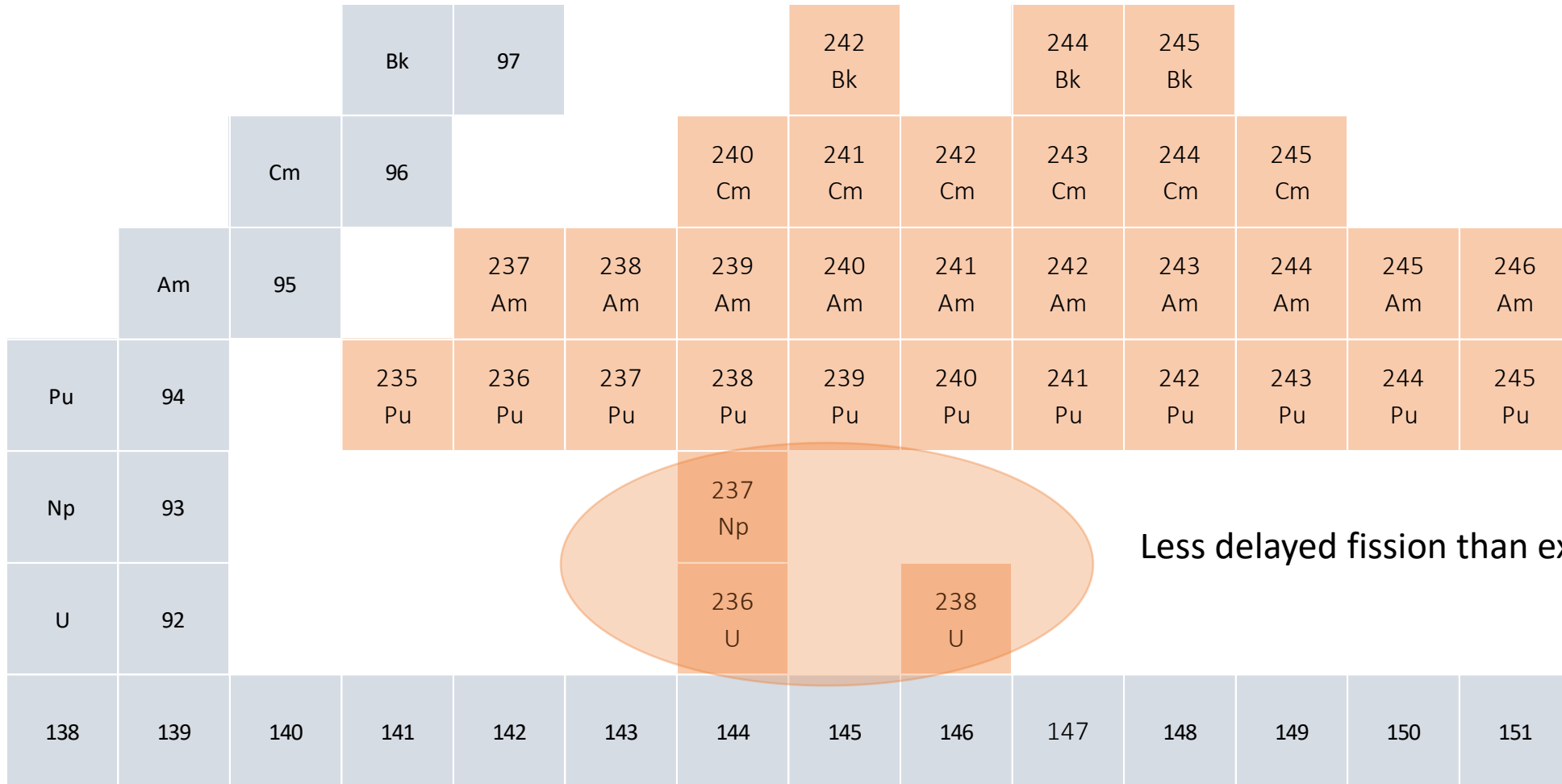


1.1 Fission shape isomers





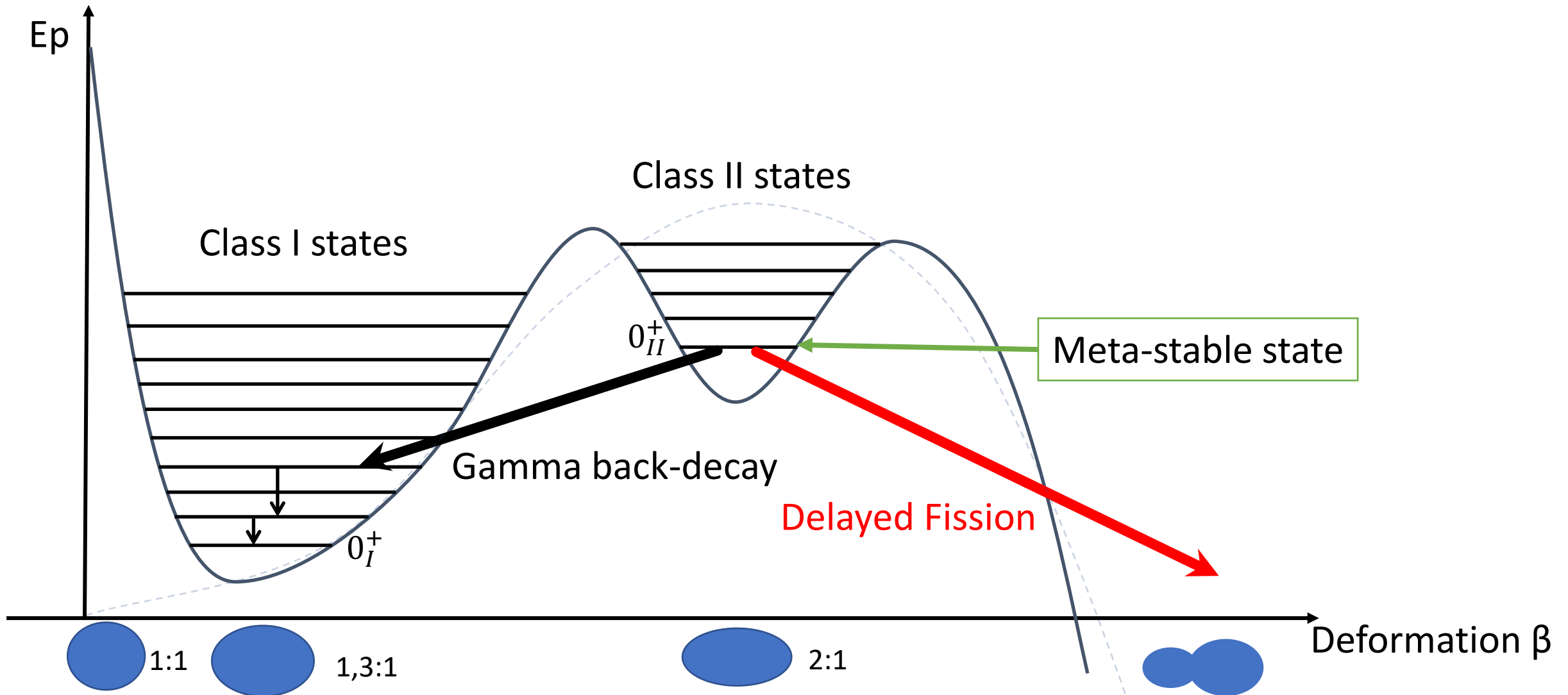
1.1 Fission shape isomers



Less delayed fission than expected !

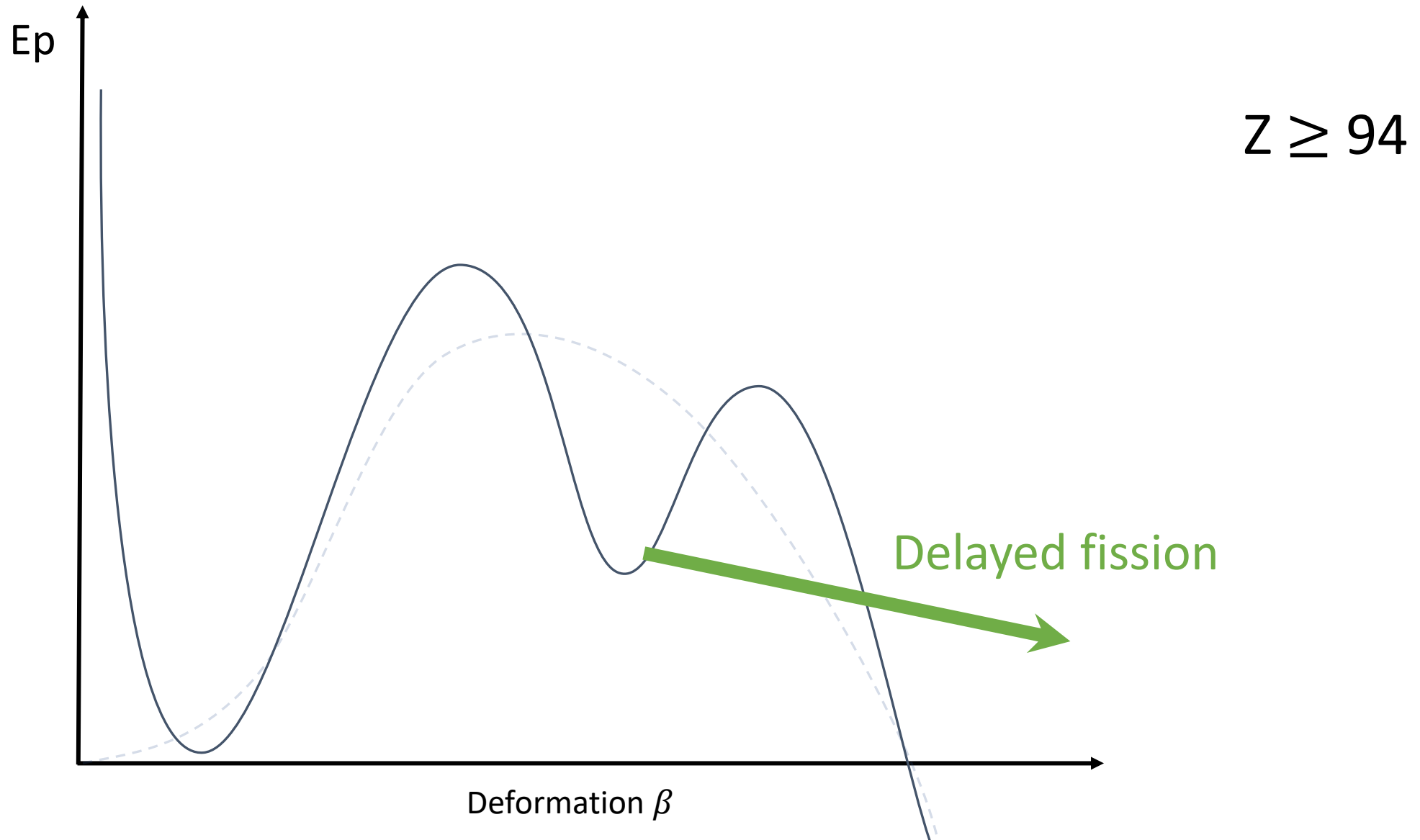


1.1 Fission shape isomers



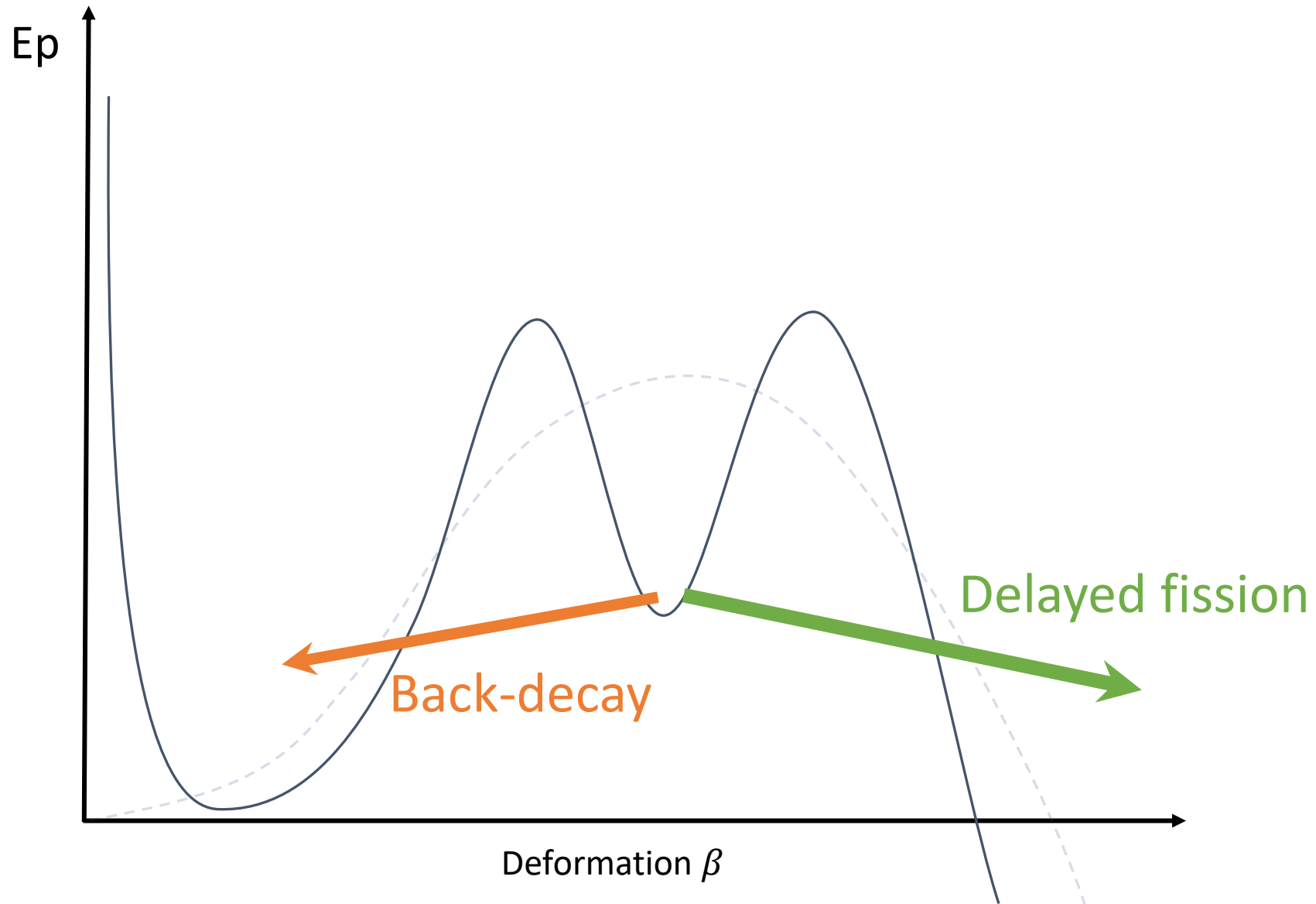


1.1 Fission shape isomers



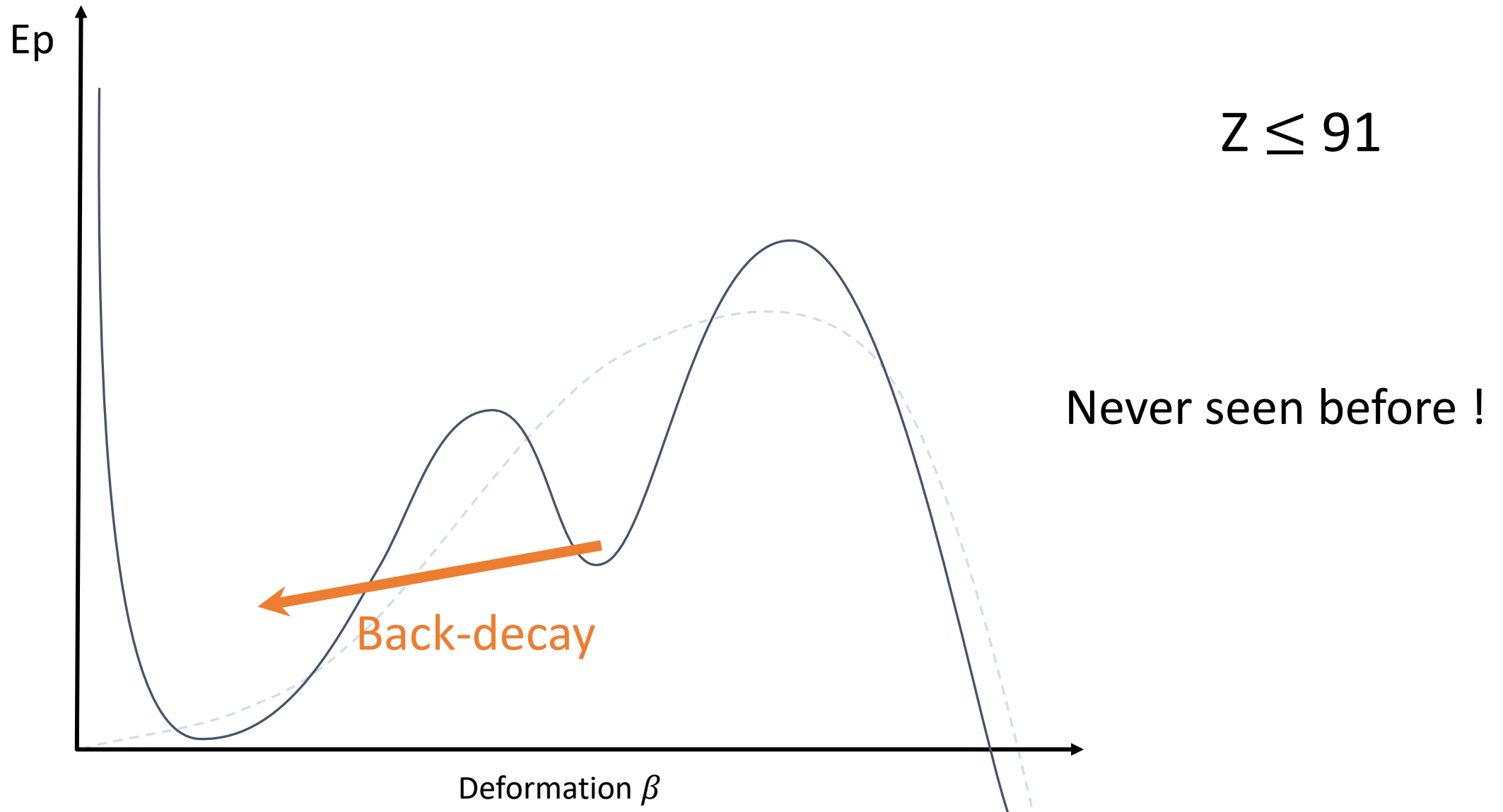


1.1 Fission shape isomers





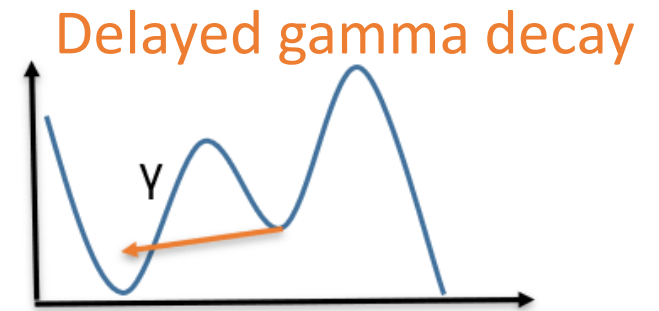
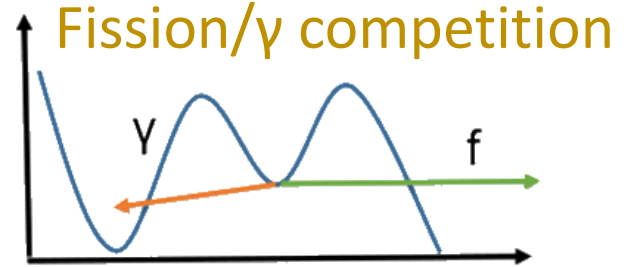
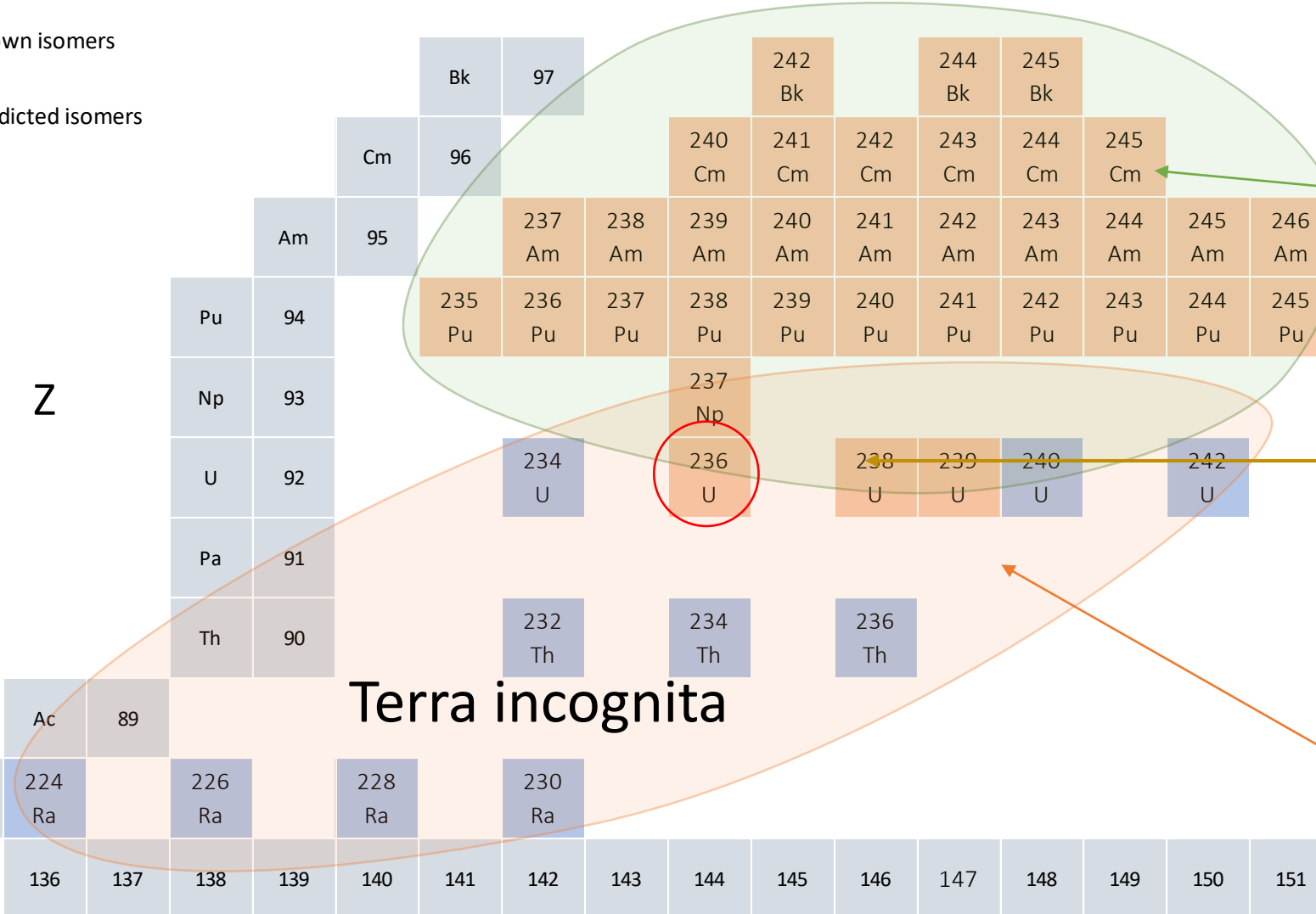
1.1 Fission shape isomers





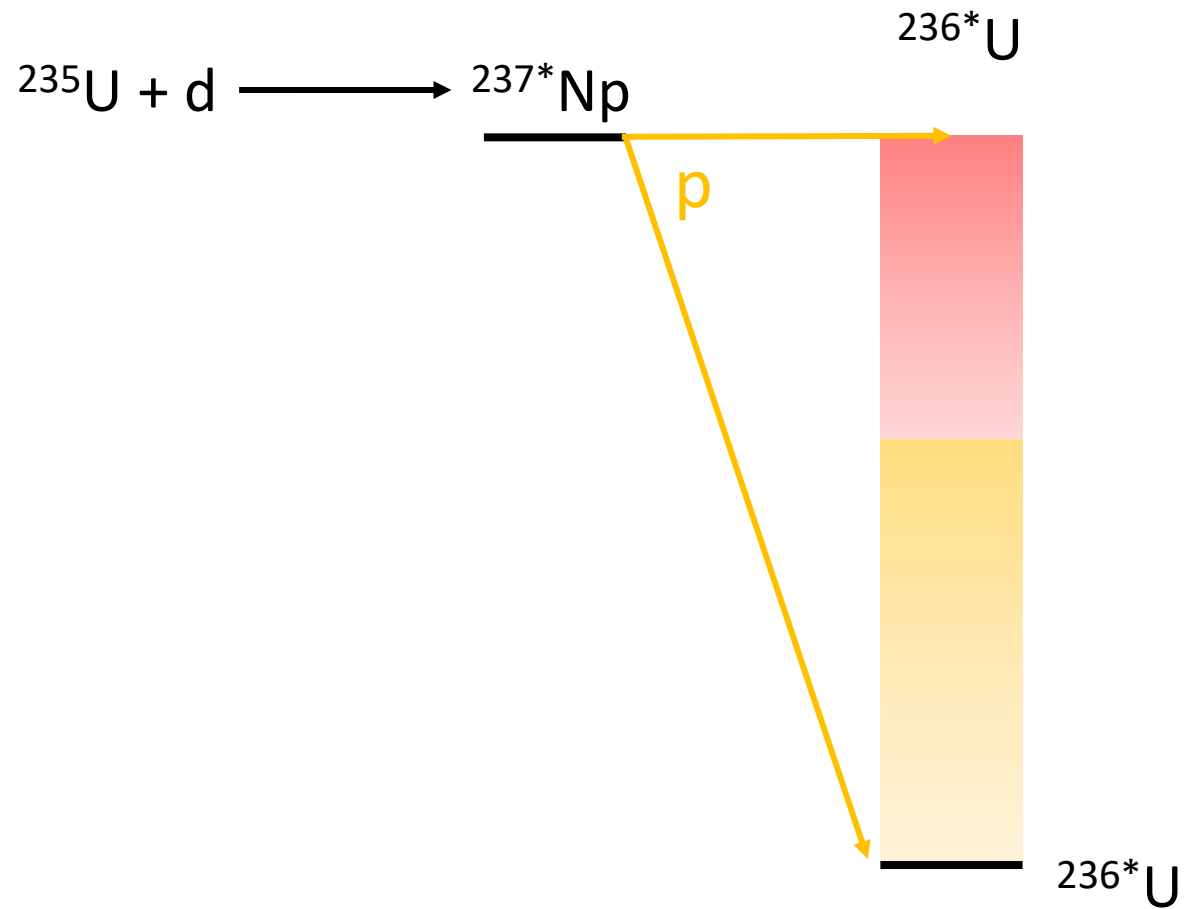
1.1 Fission shape isomers

Known isomers
Predicted isomers



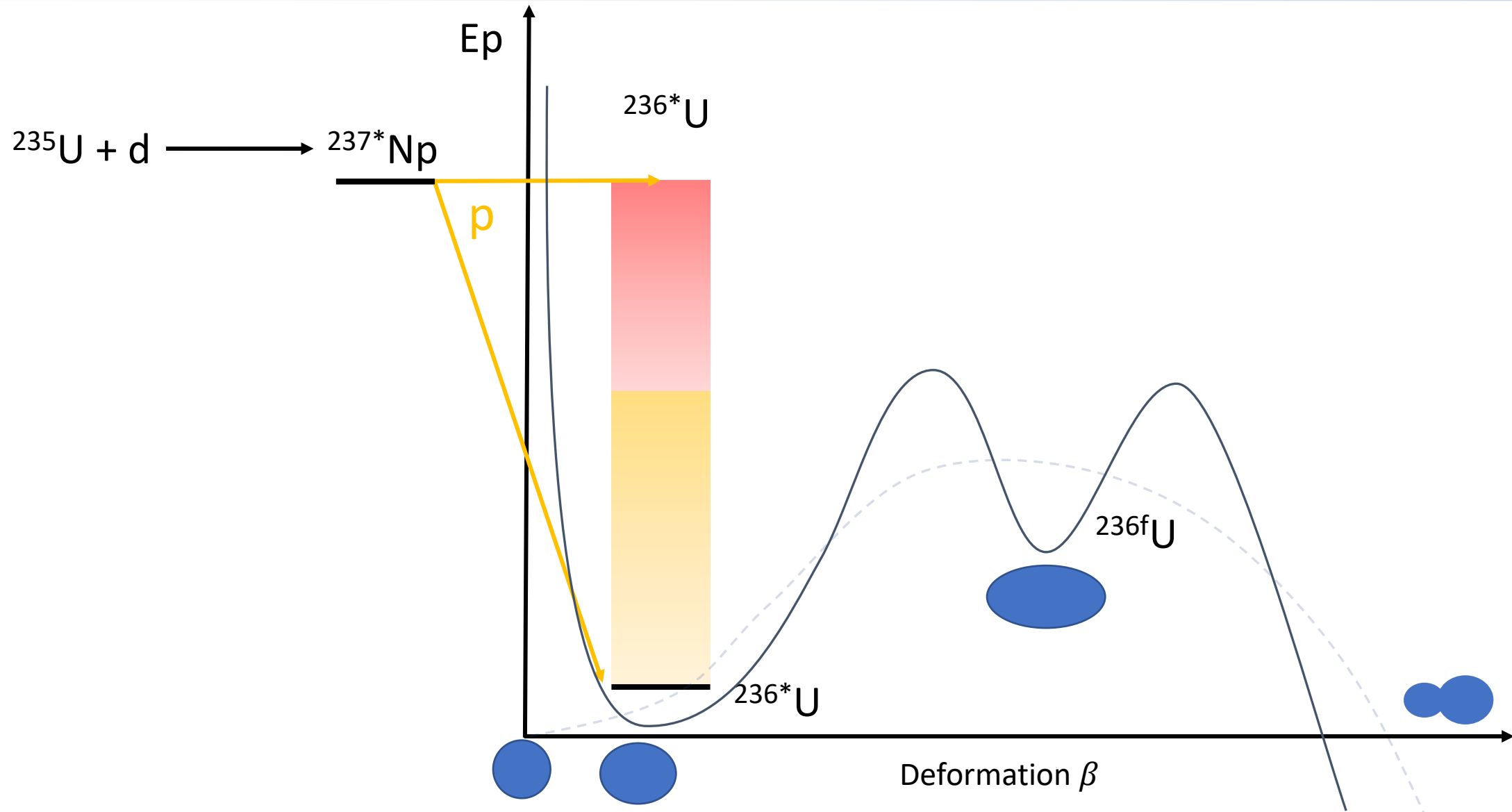


1.2 In search of γ back-decay



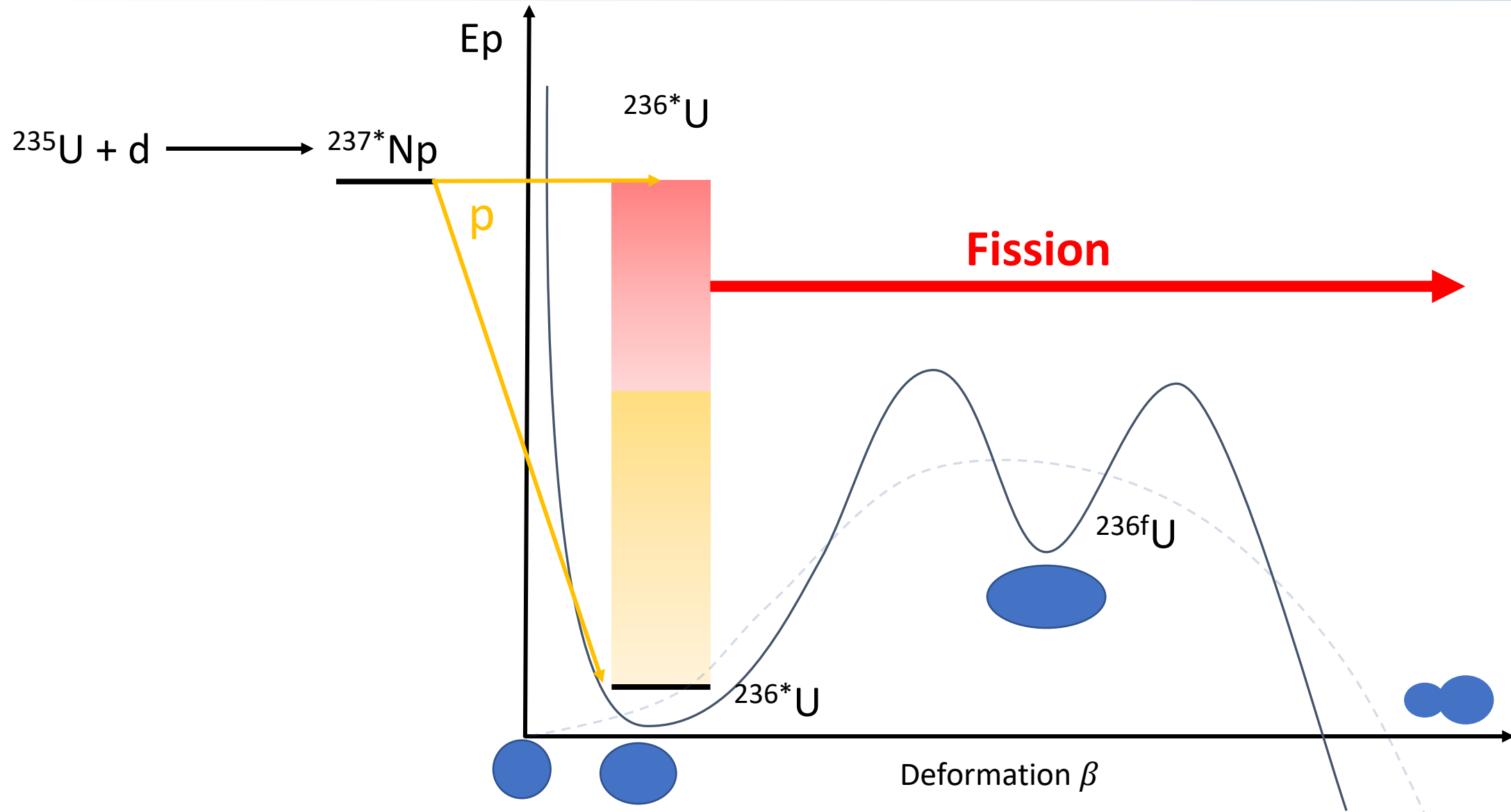


1.2 In search of γ back-decay



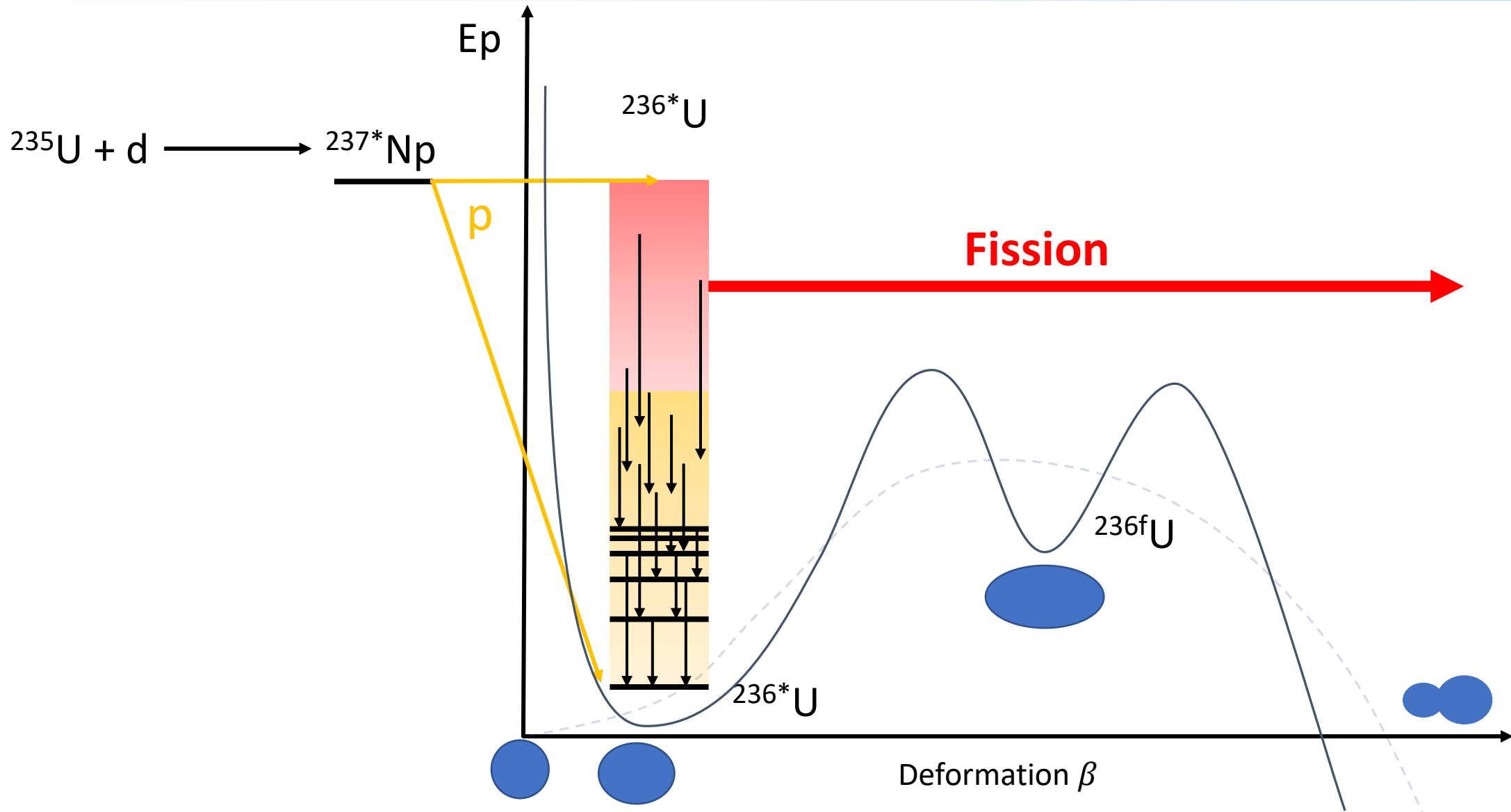


1.2 In search of γ back-decay



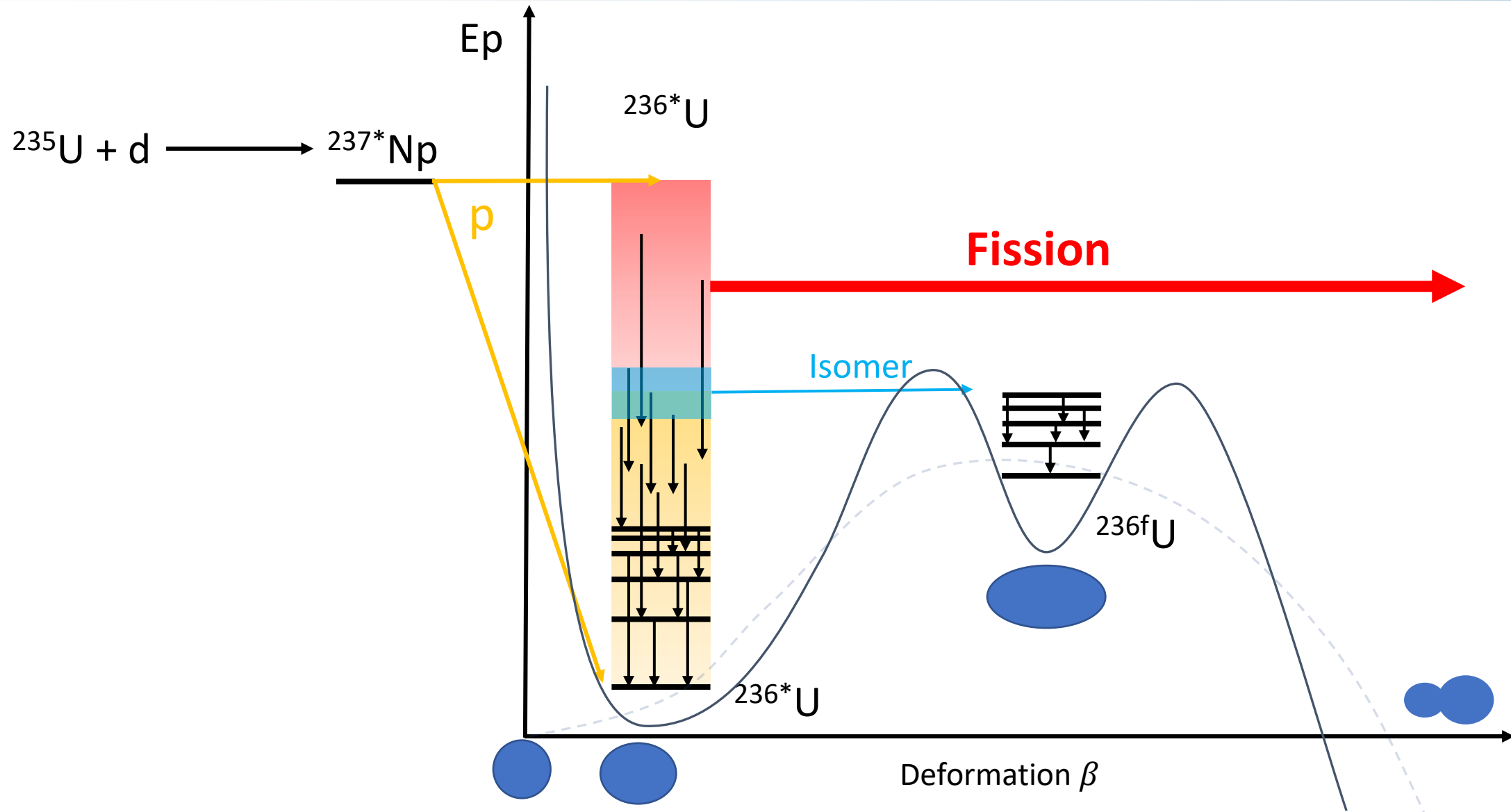


1.2 In search of γ back-decay



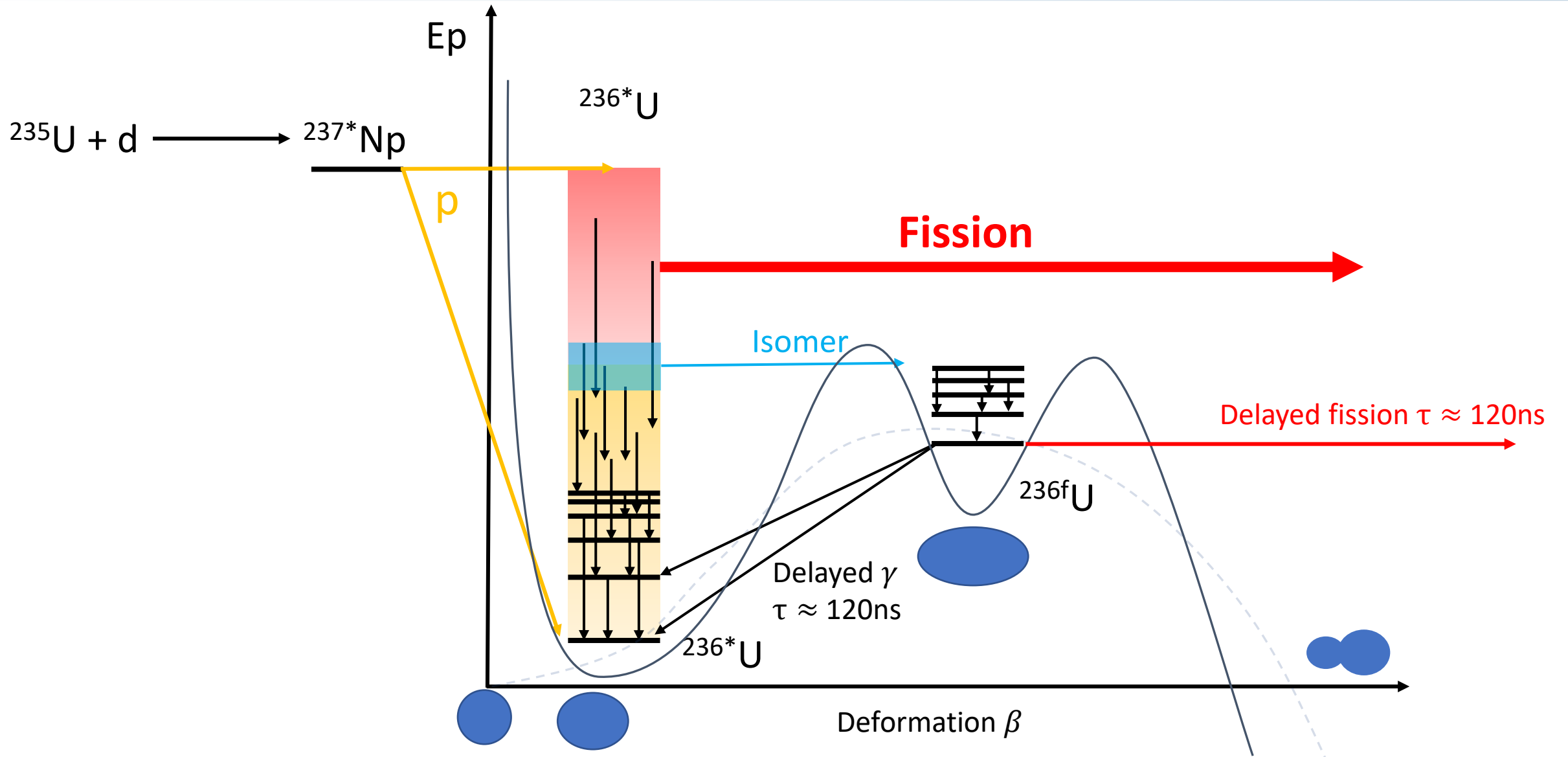


1.2 In search of γ back-decay



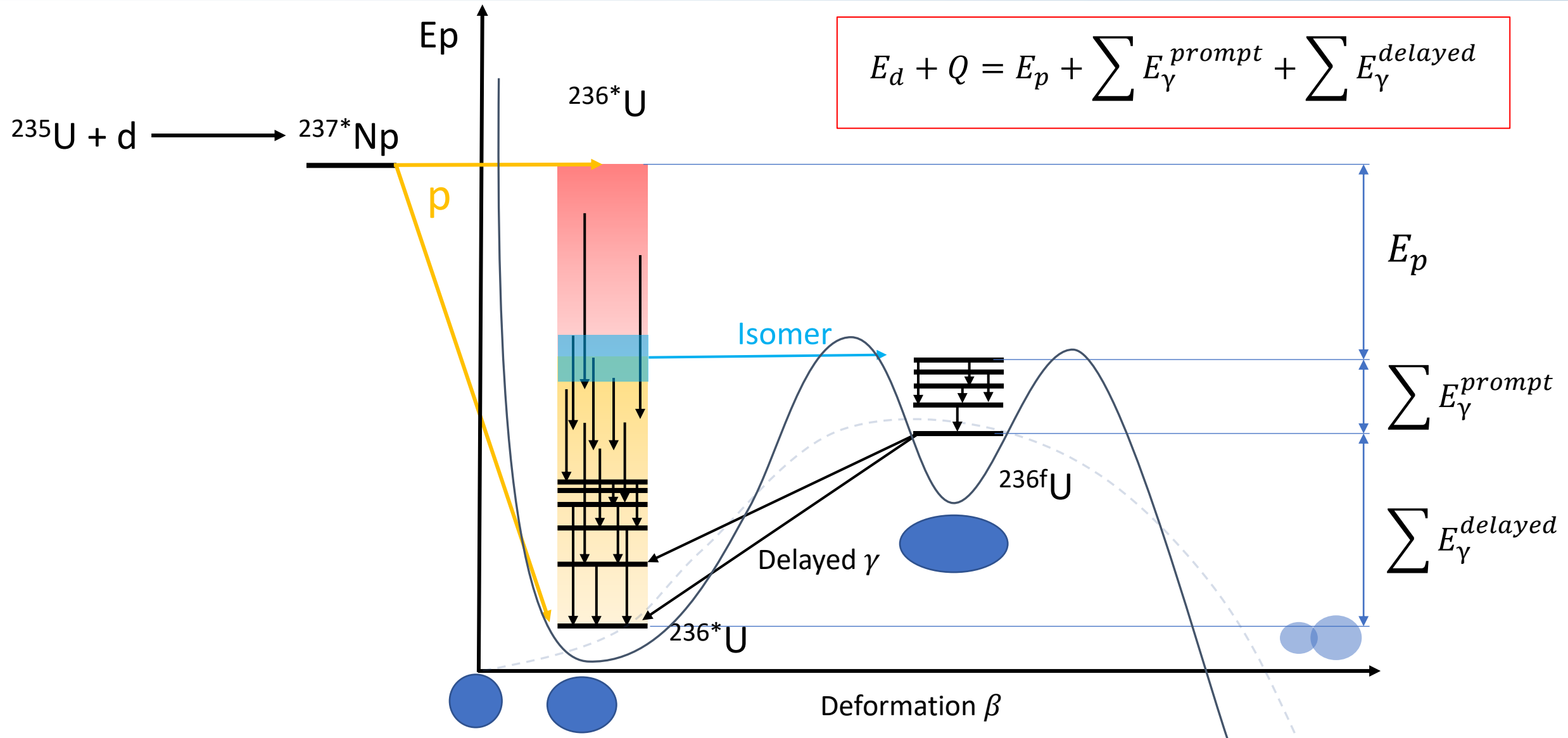


1.2 In search of γ back-decay



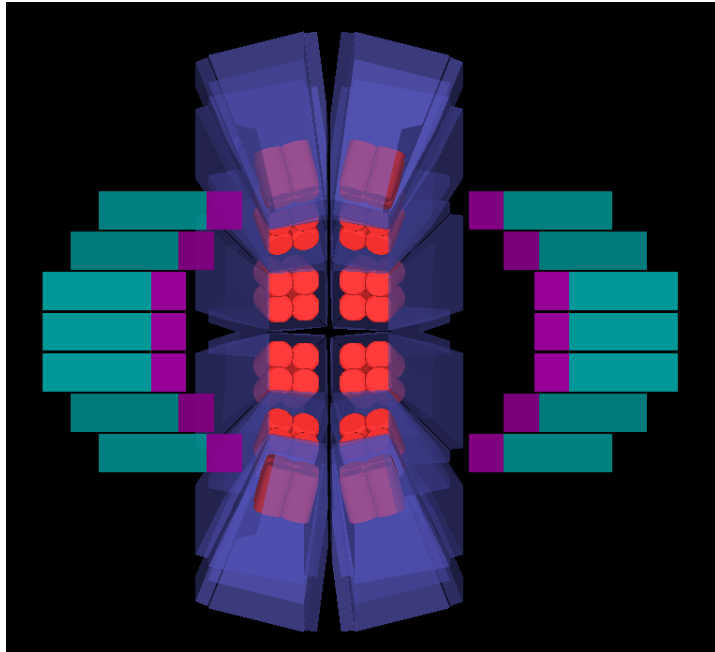


1.2 In search of γ back-decay

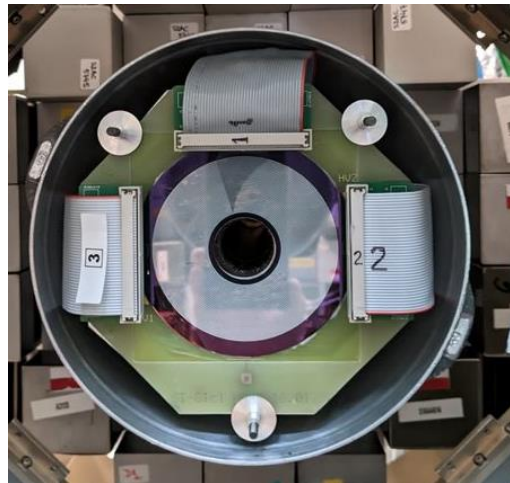




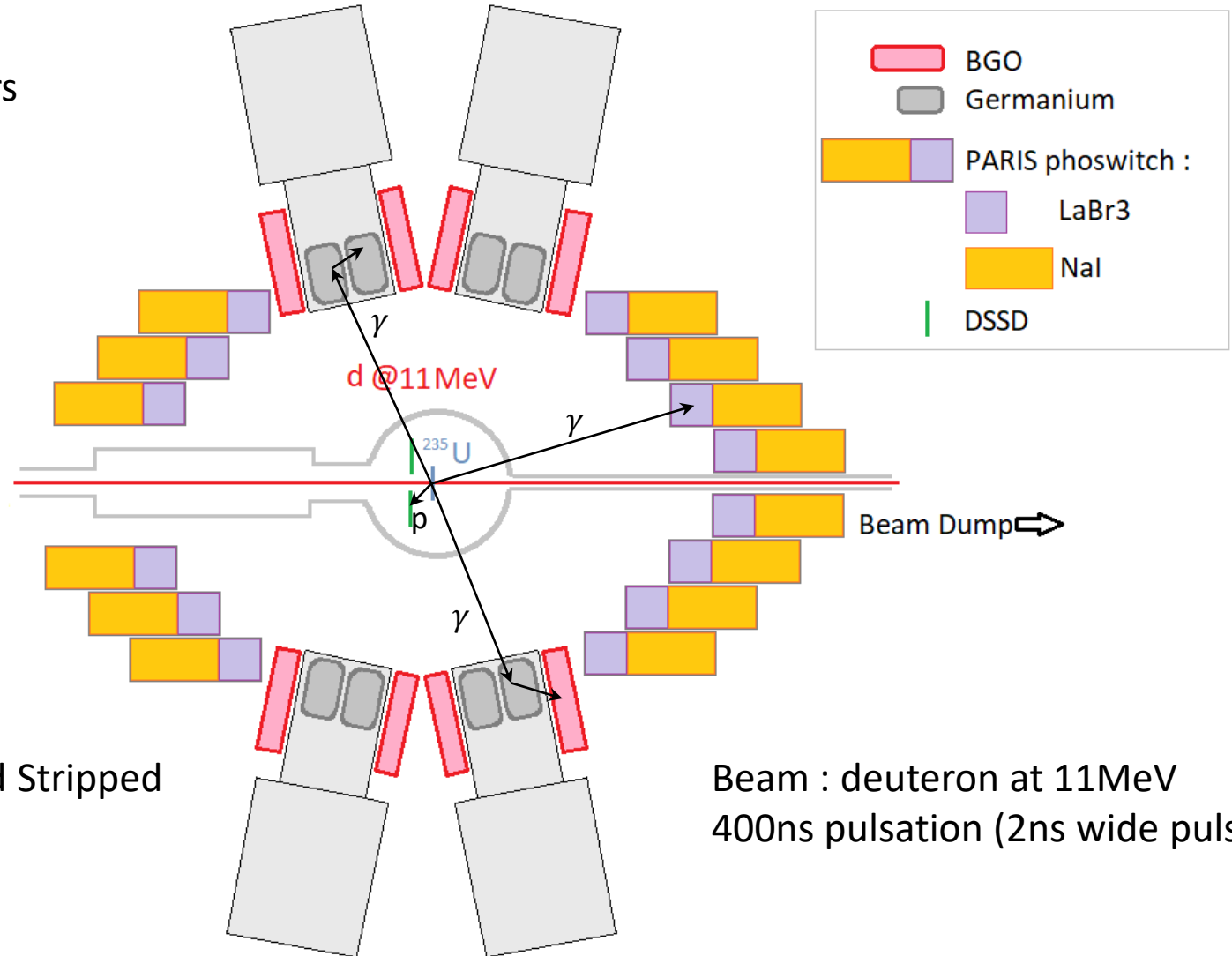
1.3 Experimental setup



24 Clovers
64 PARIS



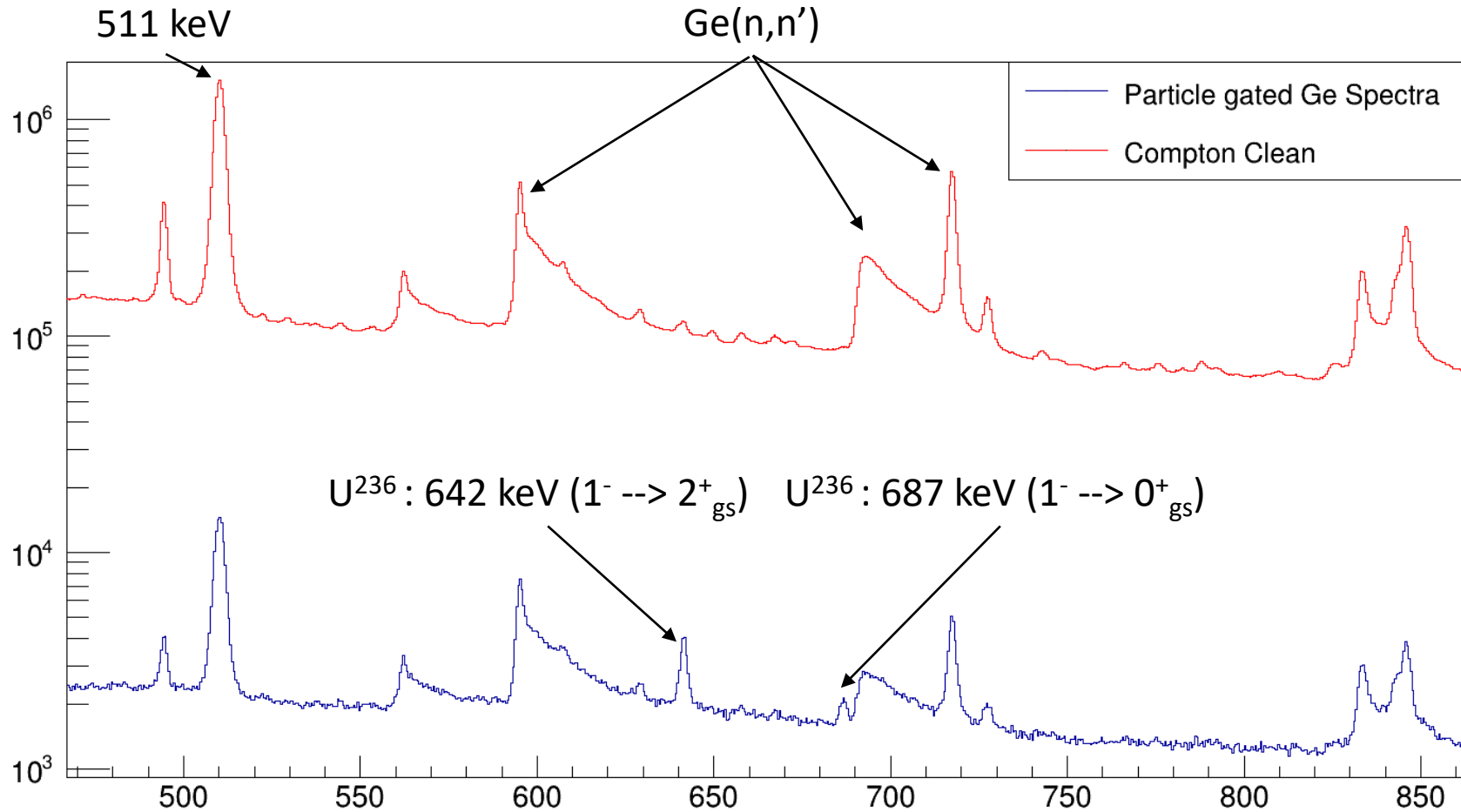
DSSD : Double-sided Stripped Silicon Detector





2.1 Germanium spectra

Condition : at least one clean Germanium (after add-back and compton suppression)



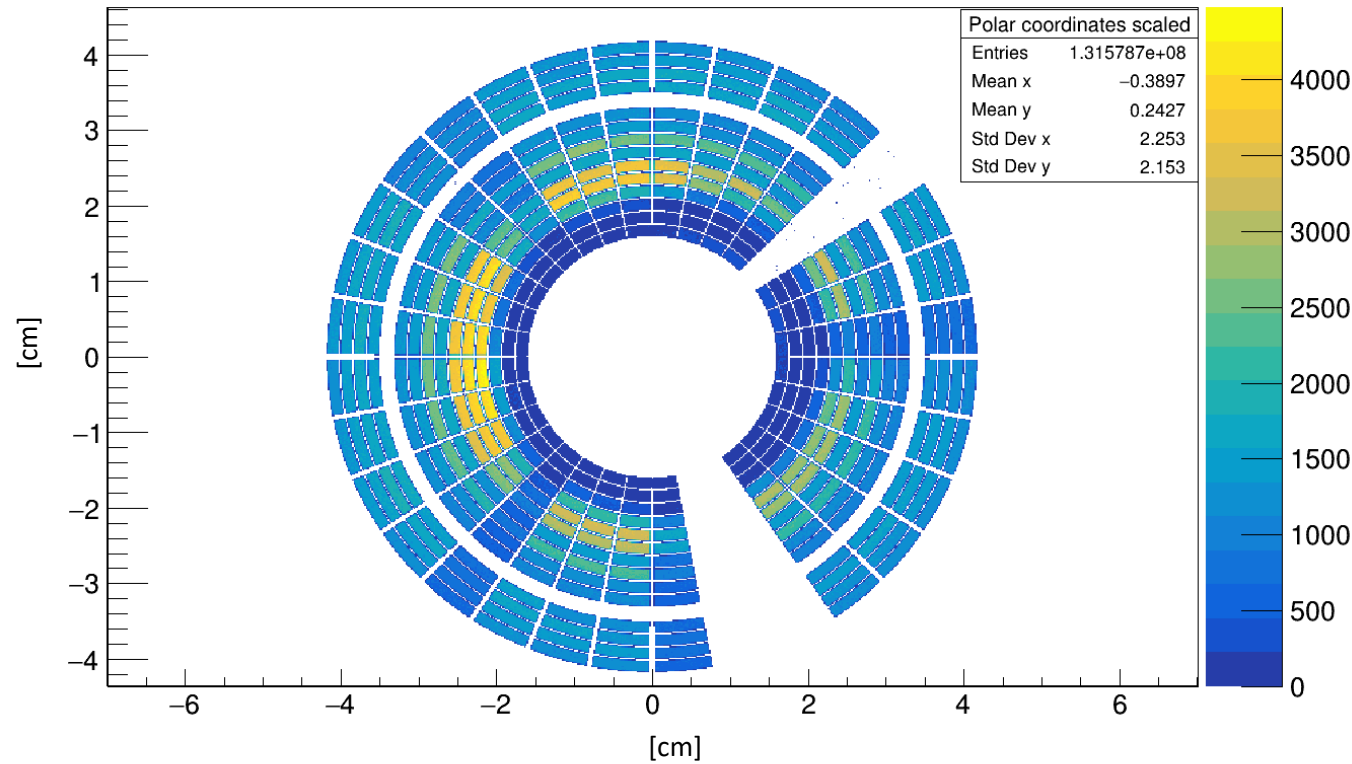
642 keV : measure of the population of ²³⁶U in the first well

Roughly $1 \cdot 10^6$ coincidences 642 keV / DSSD with pulsed beam

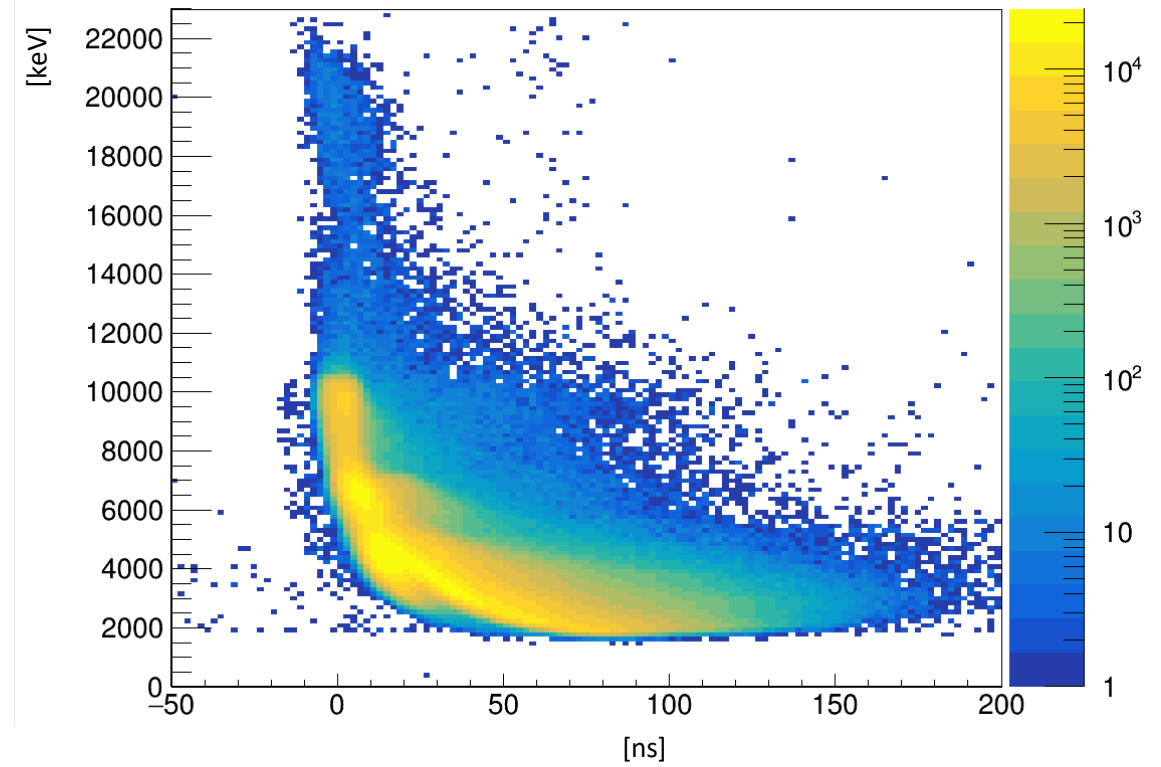


2.2 DSSD plots

Polar coordinates scaled



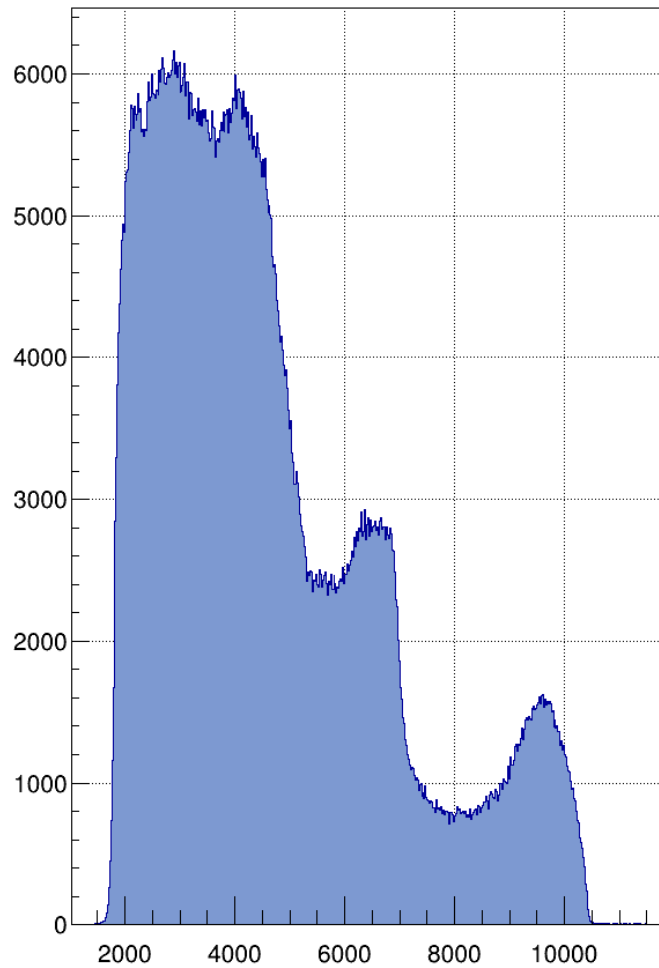
Plot E = f(t)



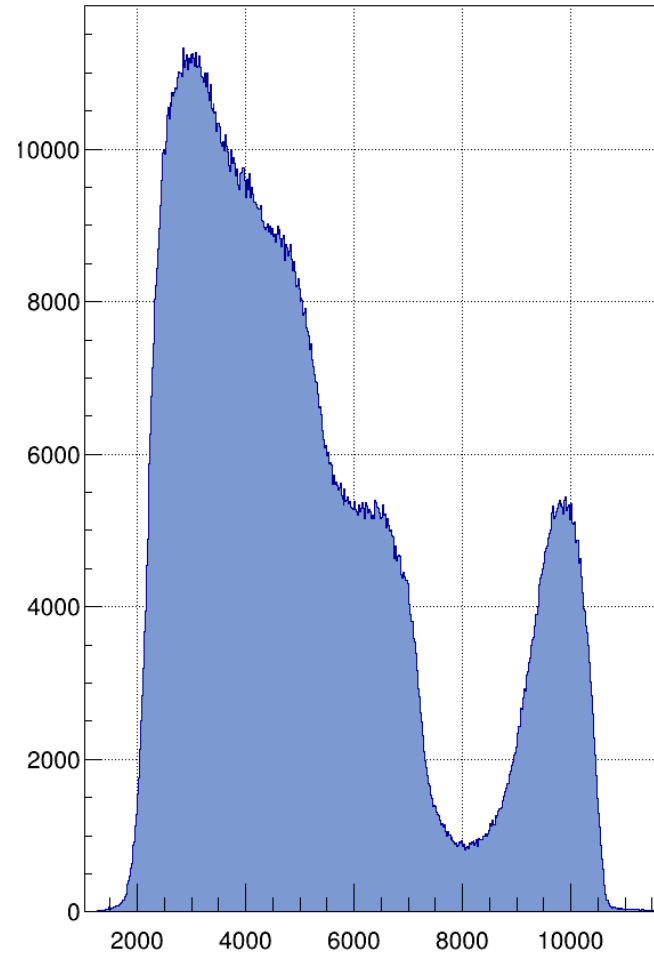


2.2 DSSD plots

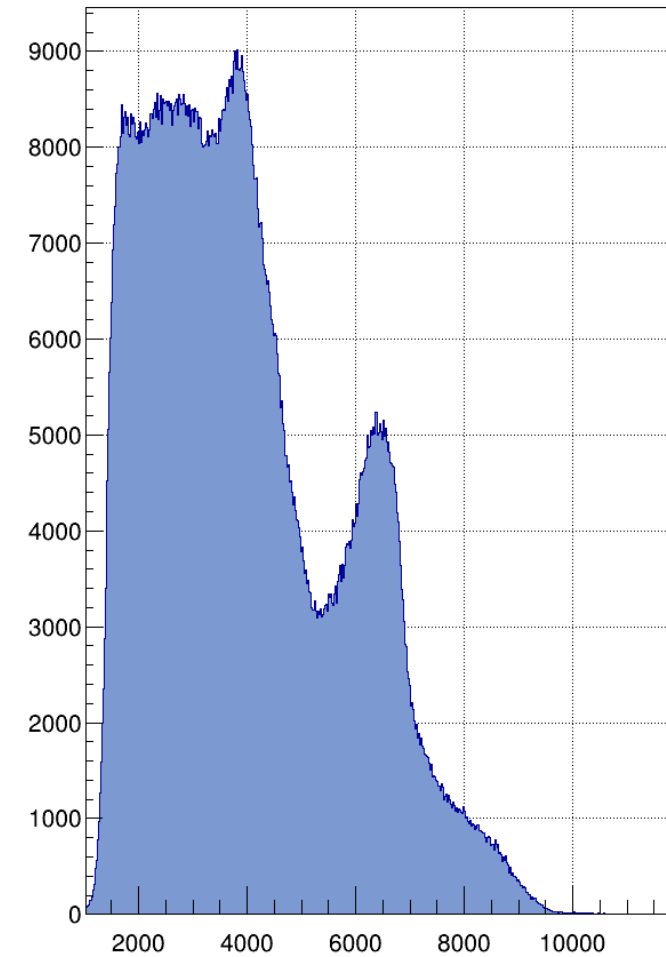
Sector



External ring

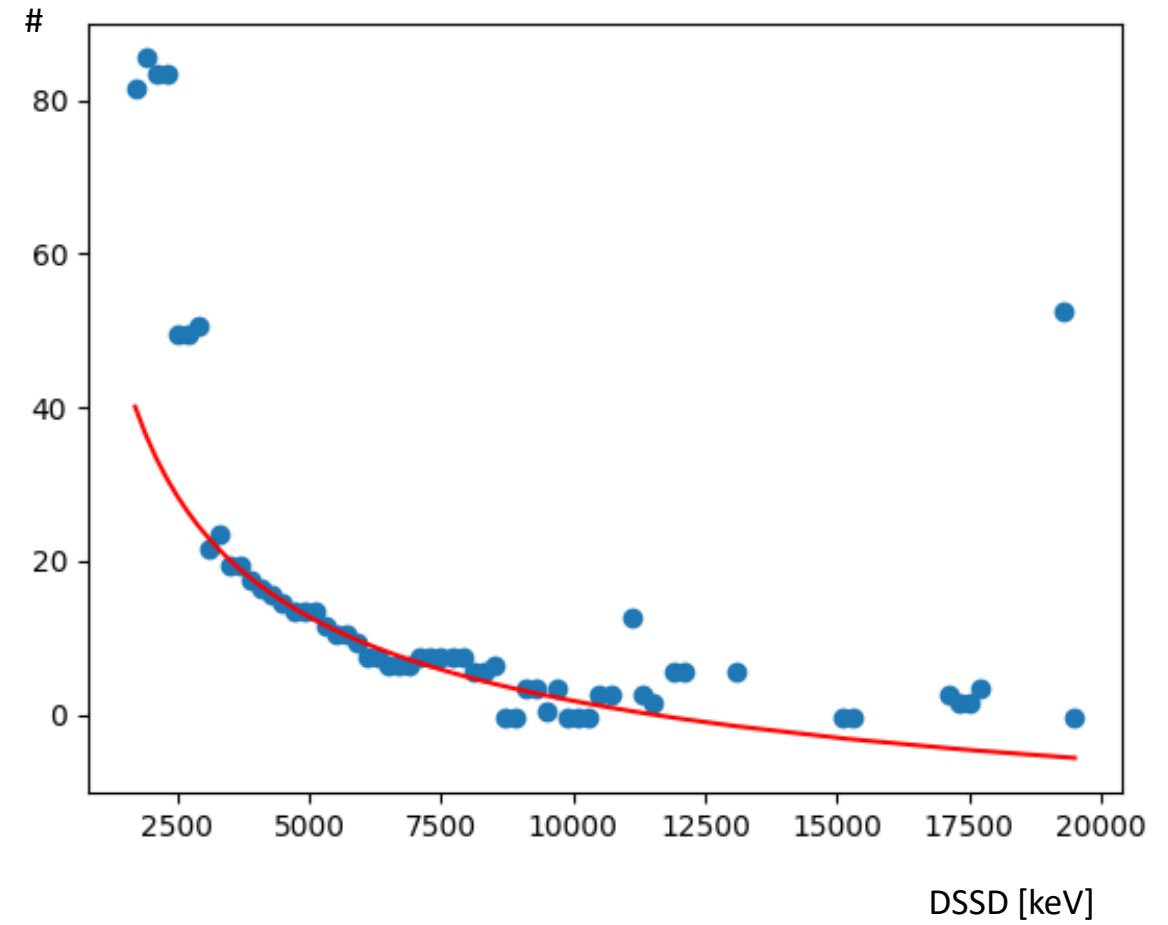
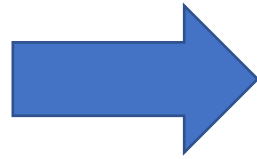
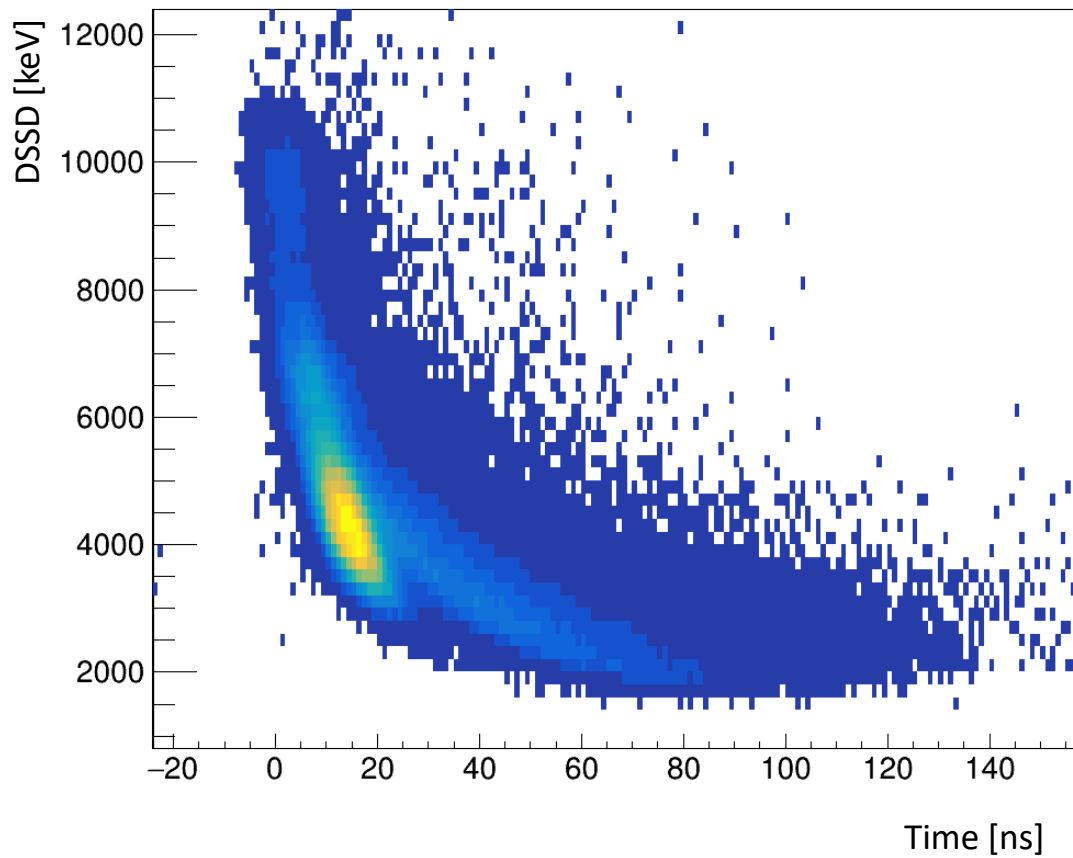


Internal ring



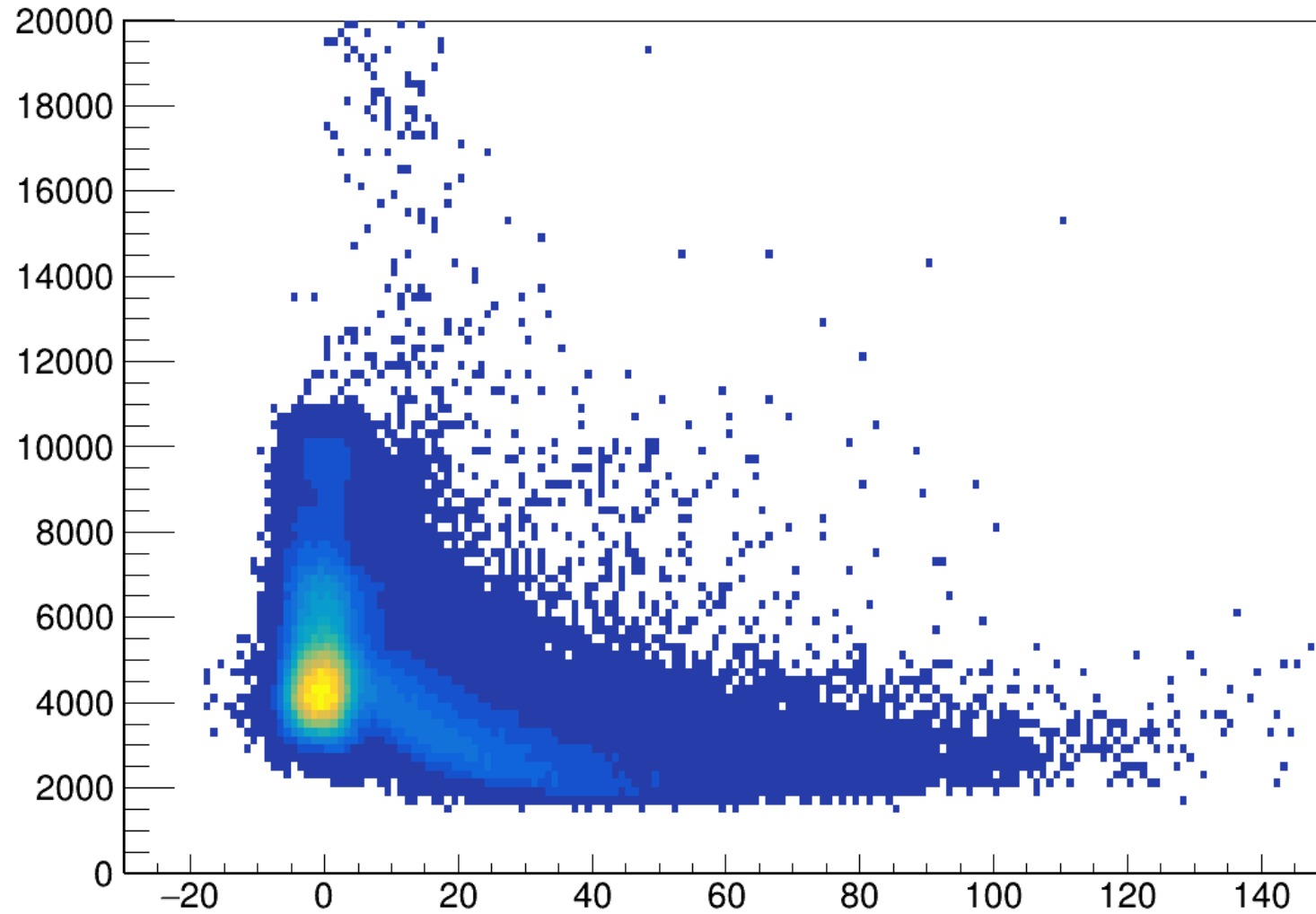


2.3 DSSD timewalk correction





2.3 DSSD timewalk correction

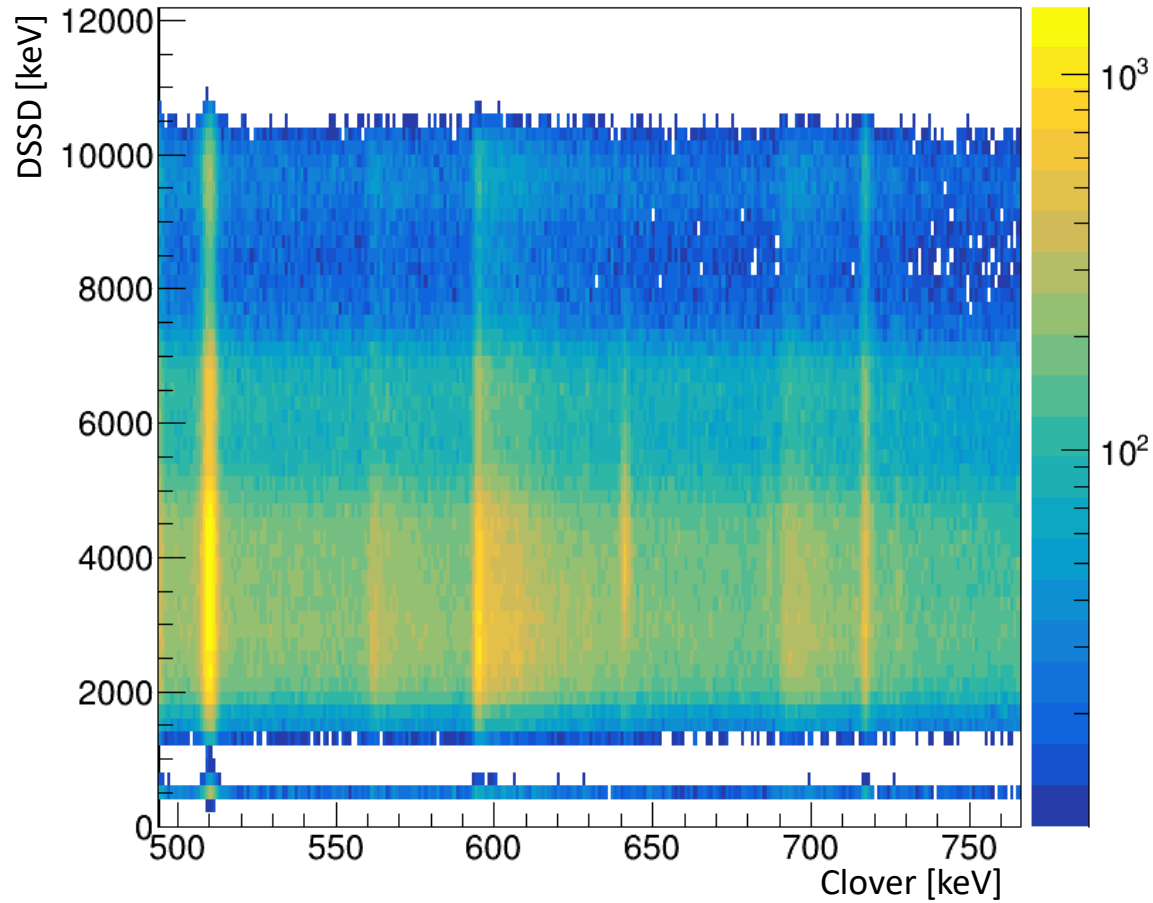


DSSD [keV]

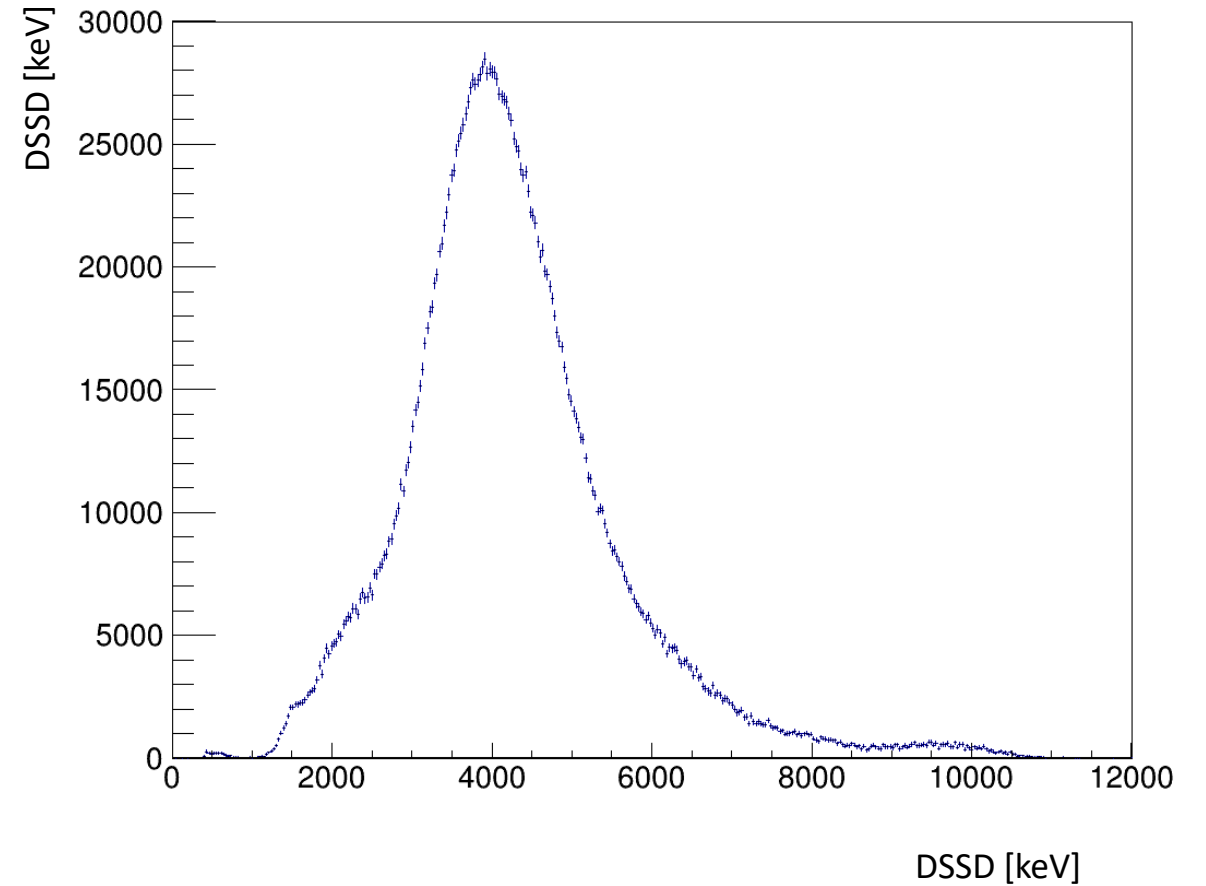


2.2 DSSD plots

DSSD VS Clover



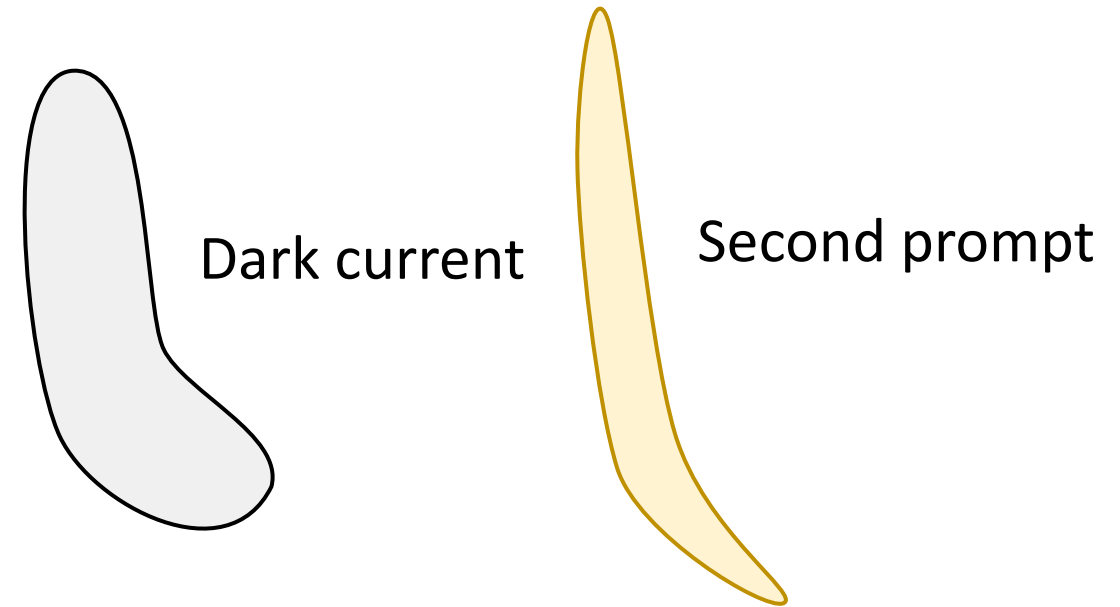
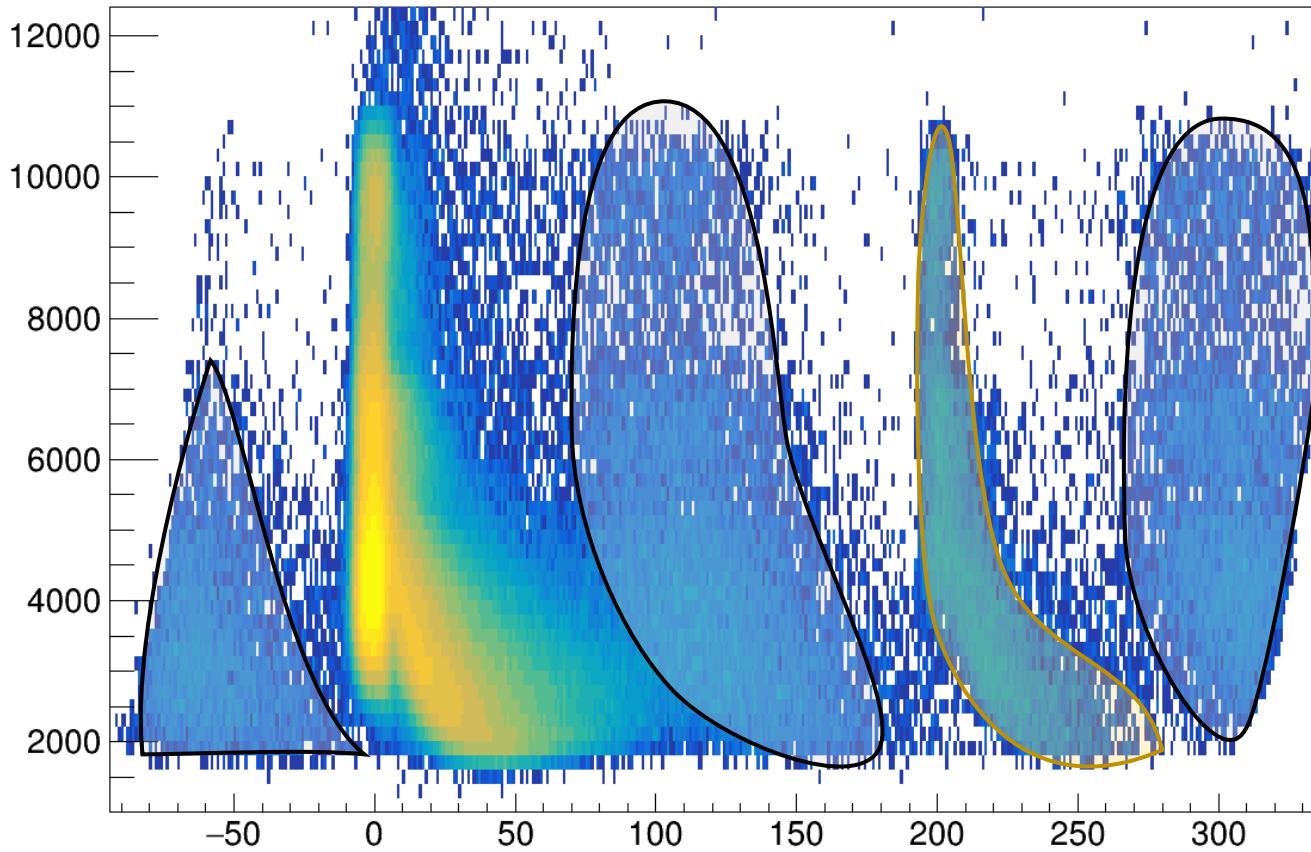
Spectre DSSD total, gate 642 keV





3. Pulsation issues

1. Most of the data have a huge dark current as well as a double peak





3. Pulsation issues

2. Half of the data is not pulsed



4. Perspectives

Manage to extract my peaks

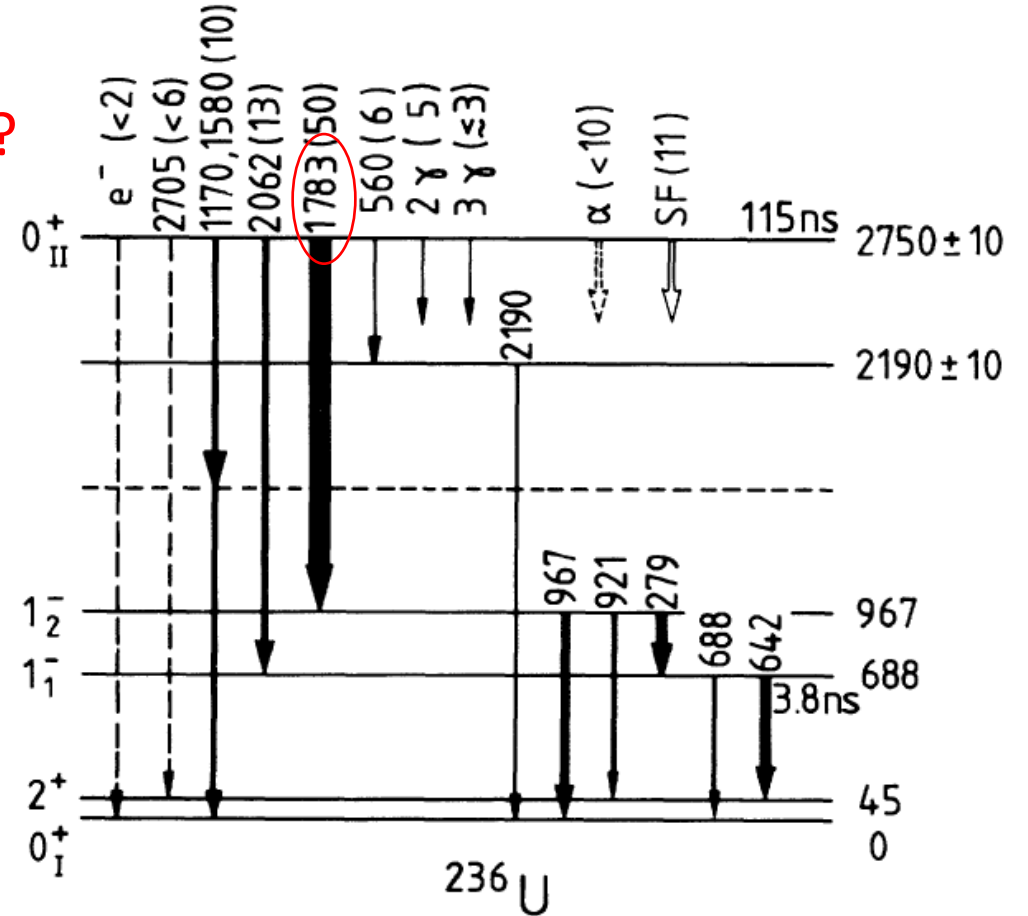
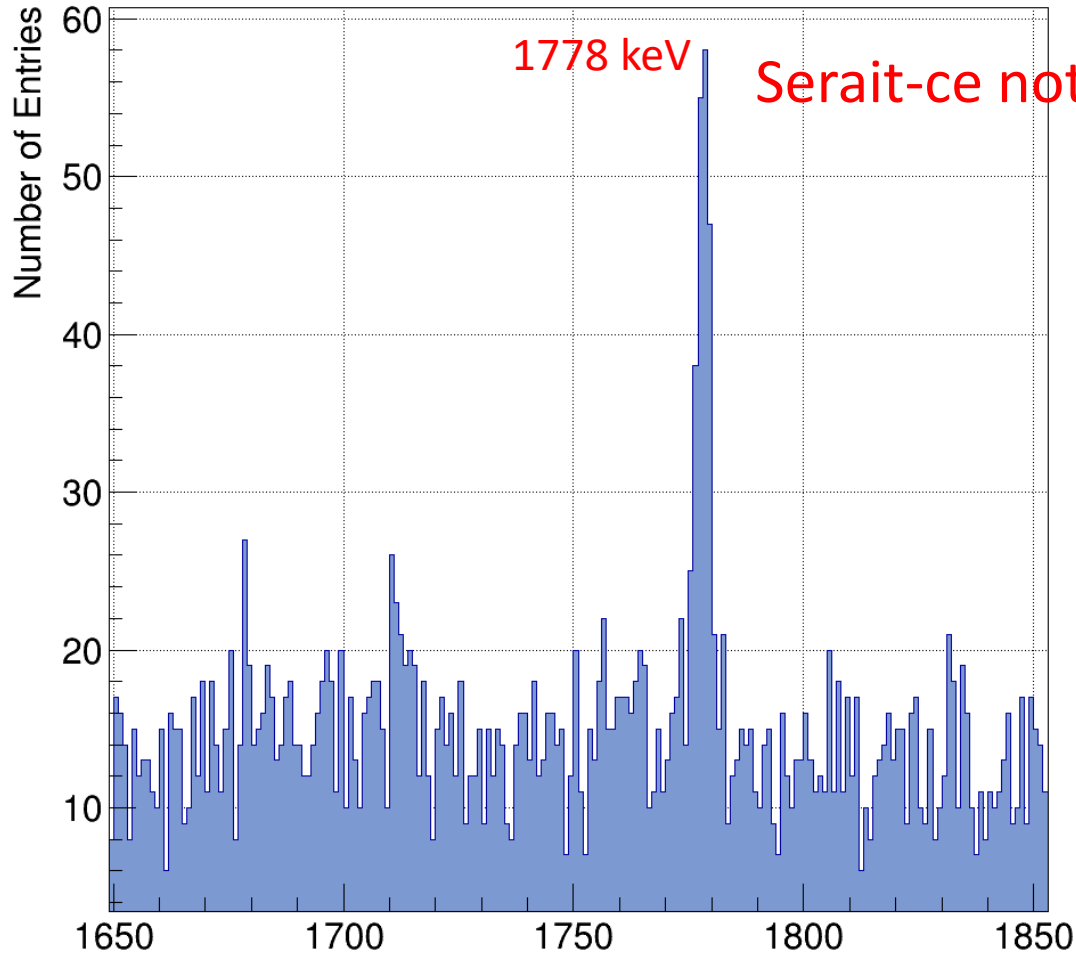
Treat the data without pulsation

Another experiment is scheduled in two weeks to study ^{232}Th



1.6 Le faux espoir

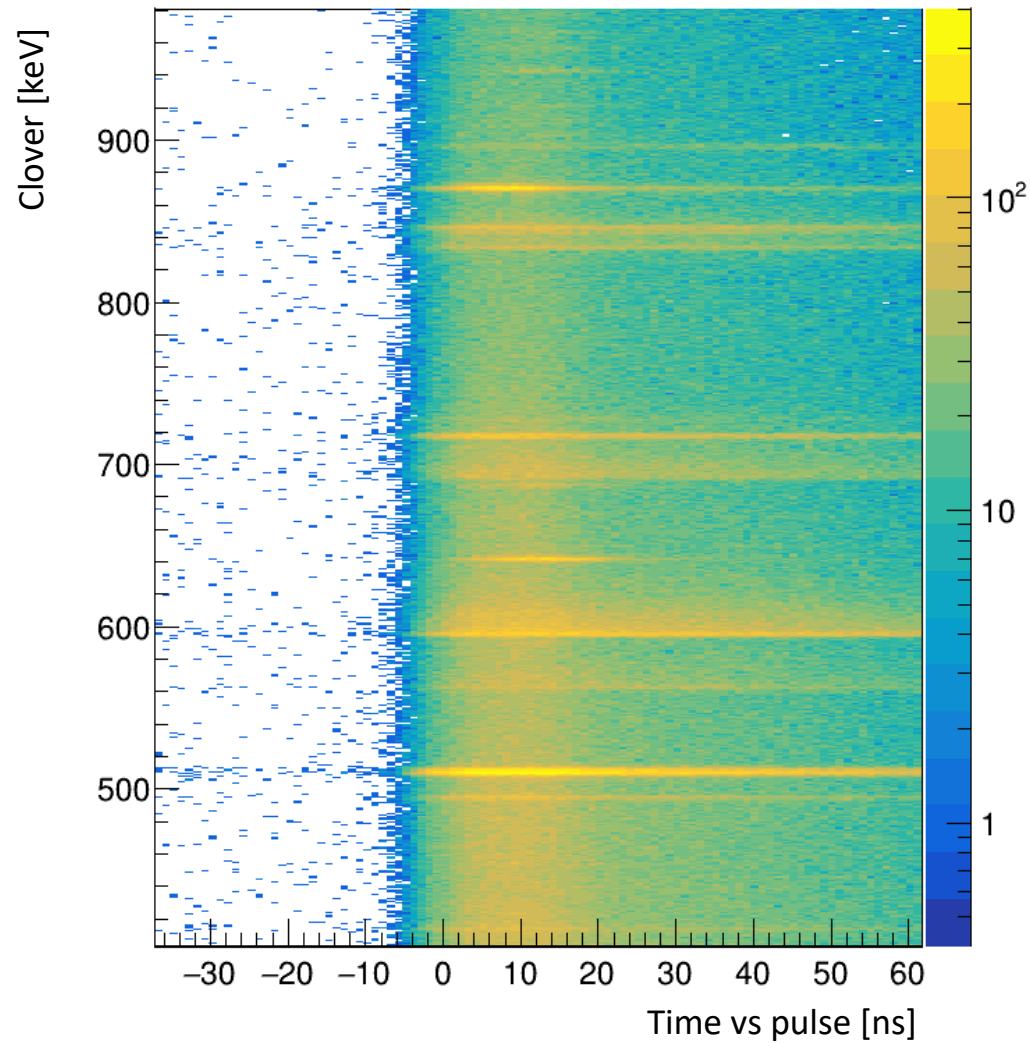
ProjectionX of biny=[78,250] [y=54.0..400.0]



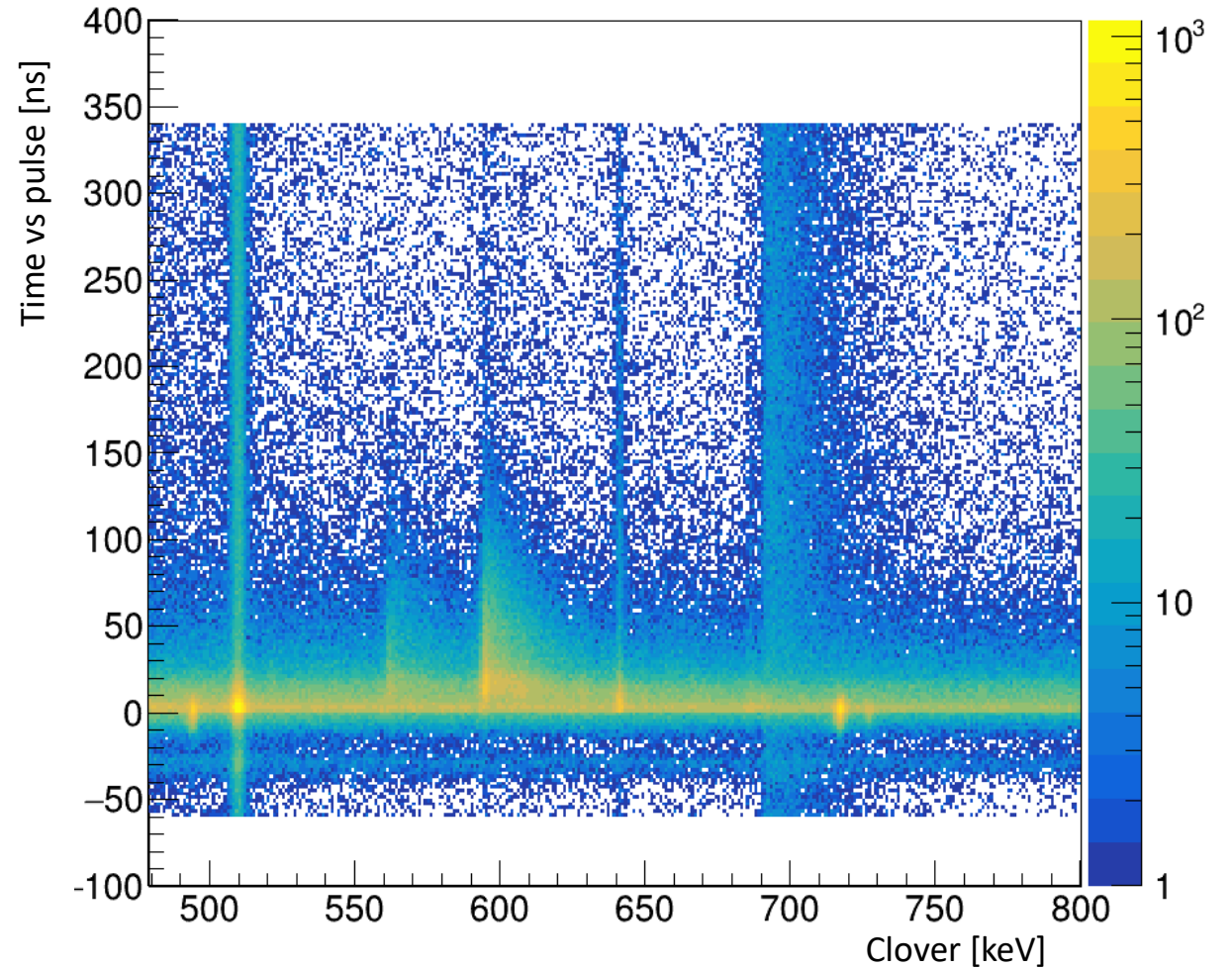


1.5 Quelques plots préliminaires du DSSD

Spectra Ge VS ToF DSSD

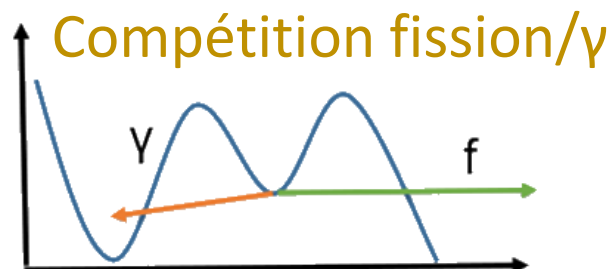
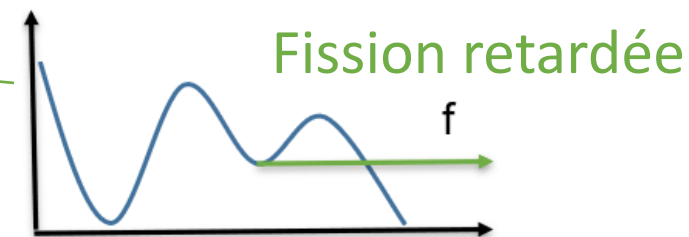
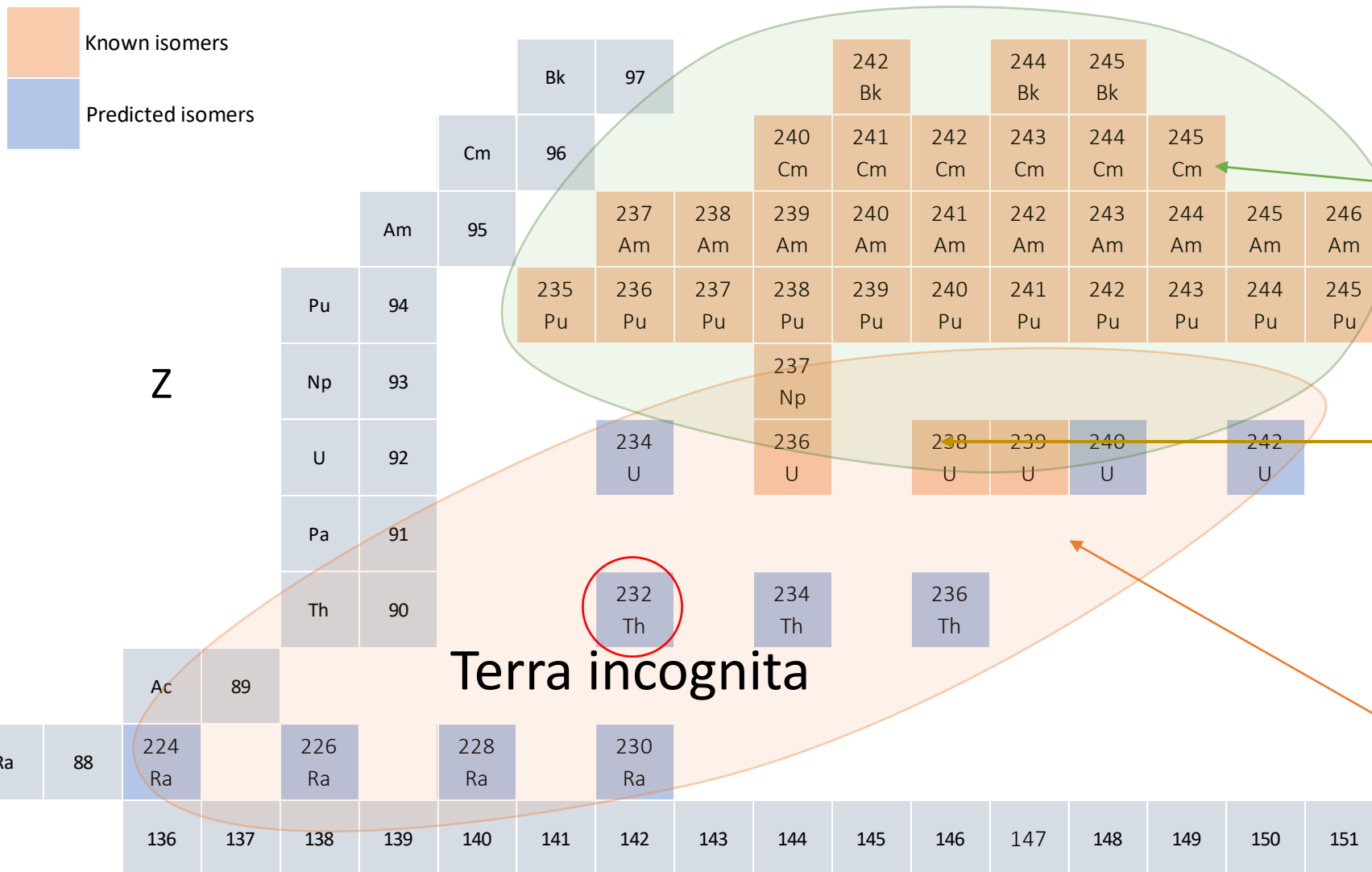


Particle in prompt, Ge Spectra



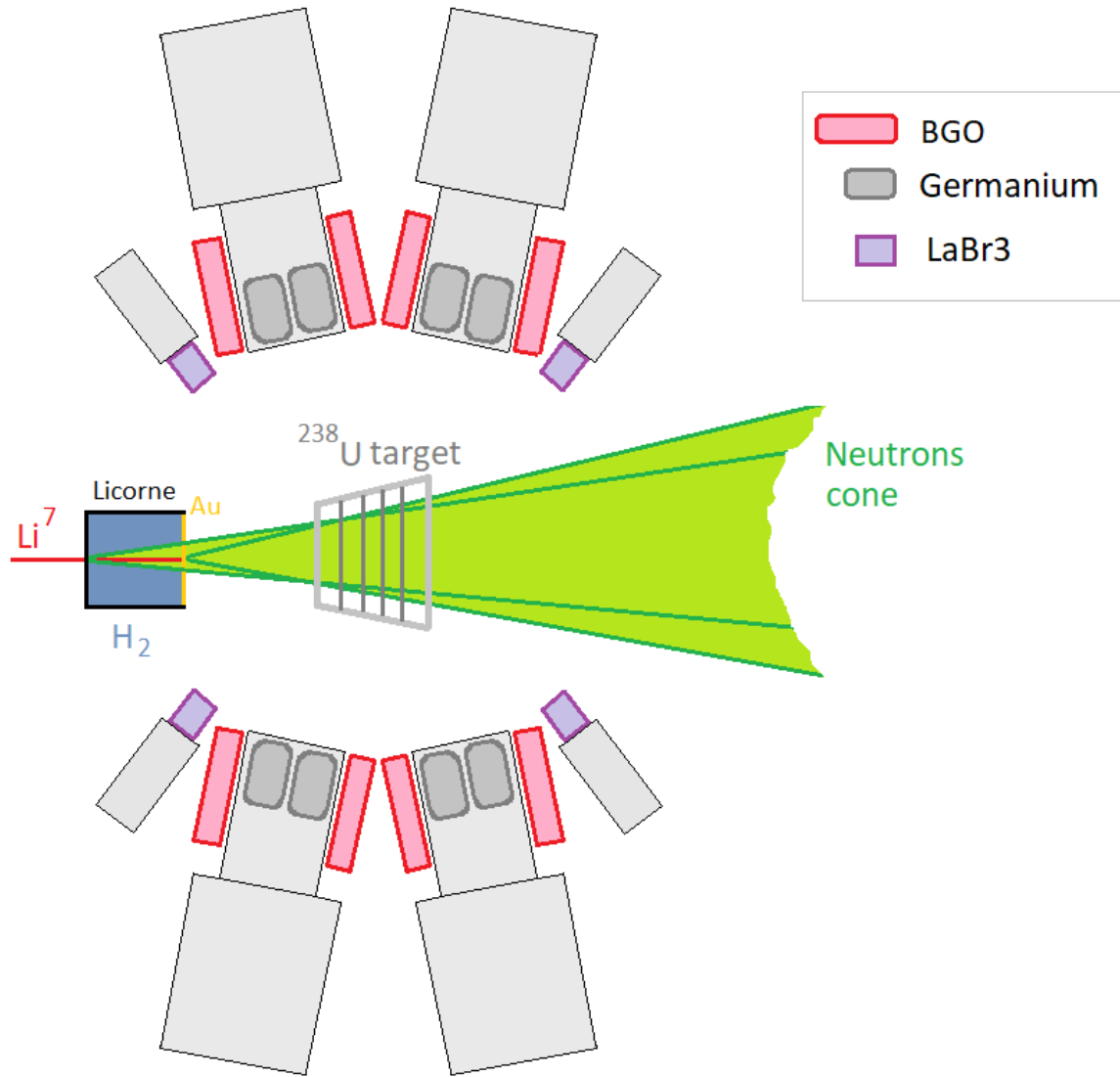


1.2 A la recherche des γ de rétro-décroissance





4. Configuration Fatima

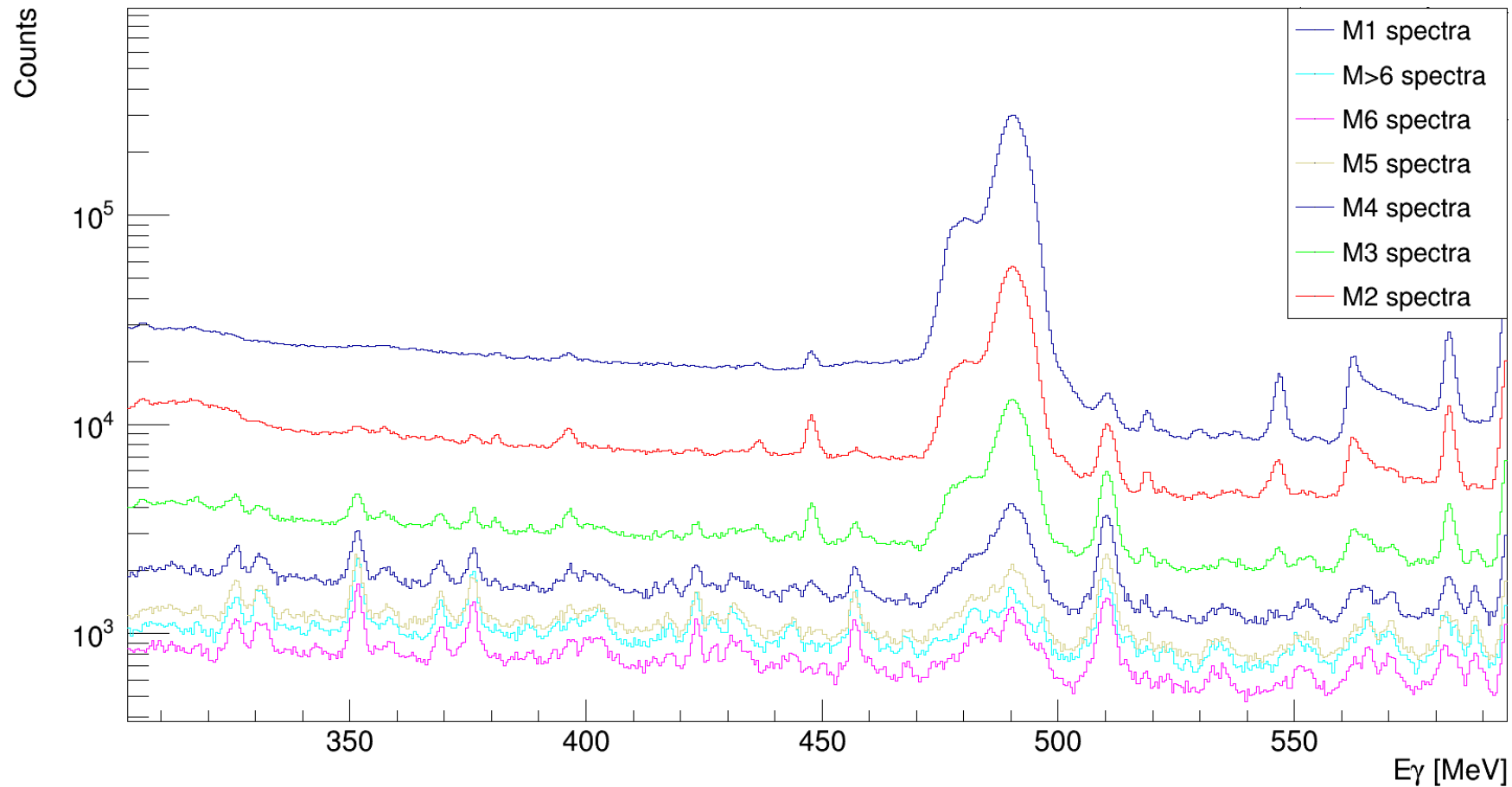




4. Configuration Fatima

Basse multiplicité : $U^{238}(n,n')$, décroissance ${}^9\text{Be}$

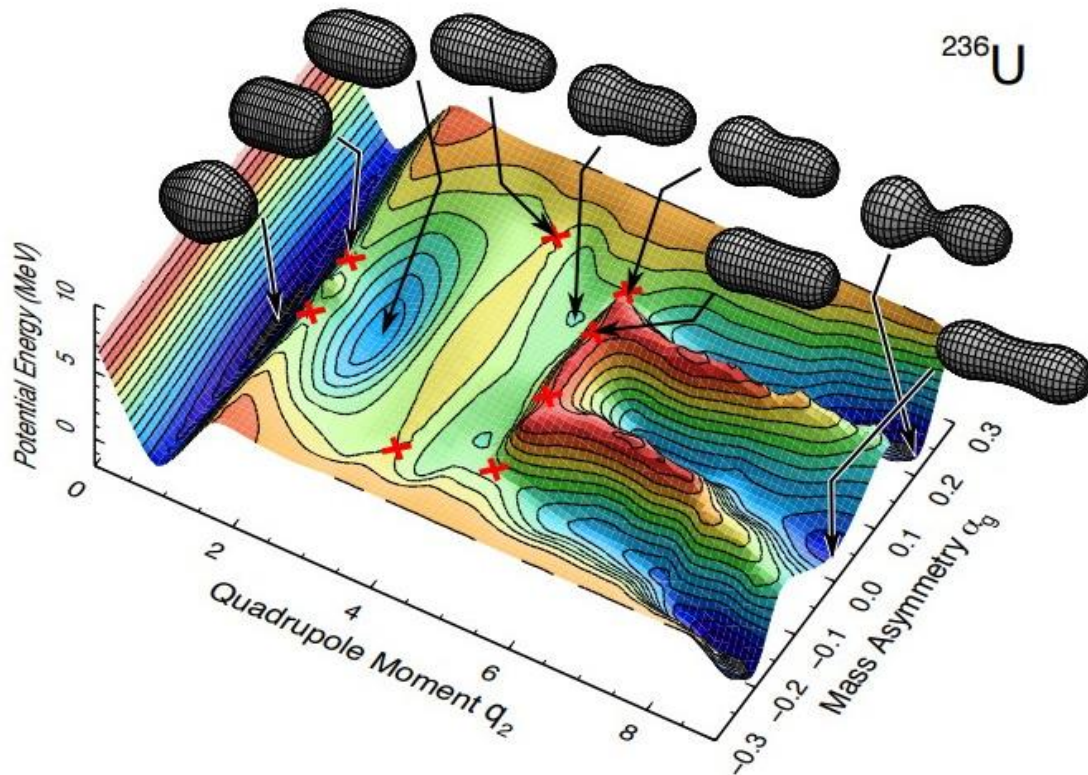
Haute multiplicité : $U^{238}(n,f)$





1.2 Why study fission isomers ?

Le chemin vers la fission est en réalité plus complexe et expérimentalement, très peu est connu...



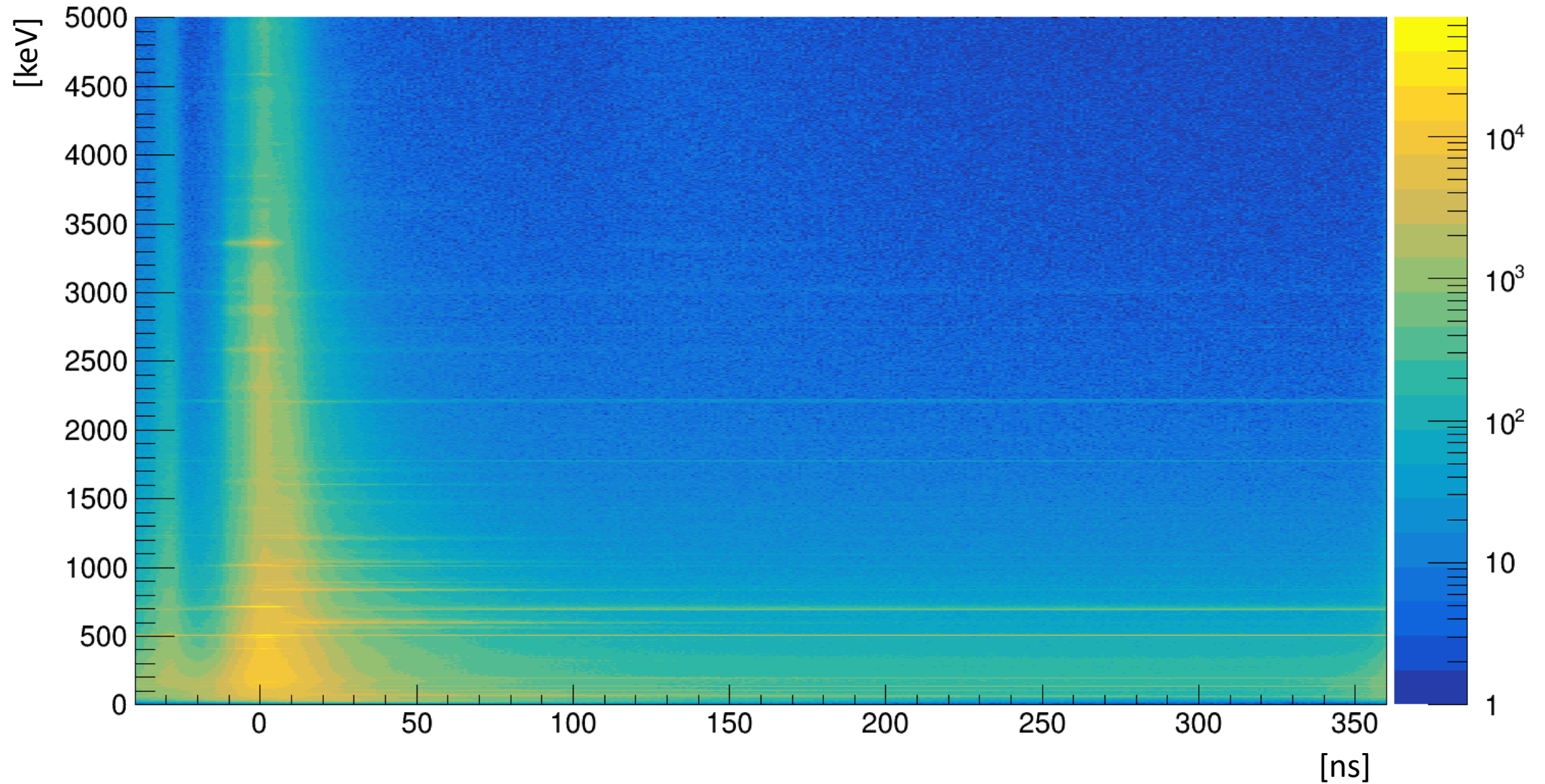
Quelles informations expérimentales souhaitons-nous obtenir?

- La nature des états du second minimum
- Informations détaillées du paysage énergétique autour du point sels.
- Paramètres de barriers : hauteur et pénétrabilité
- Nombre de barrières
- Etats de transition vers la fission



2.1 Premiers spectres Clovers

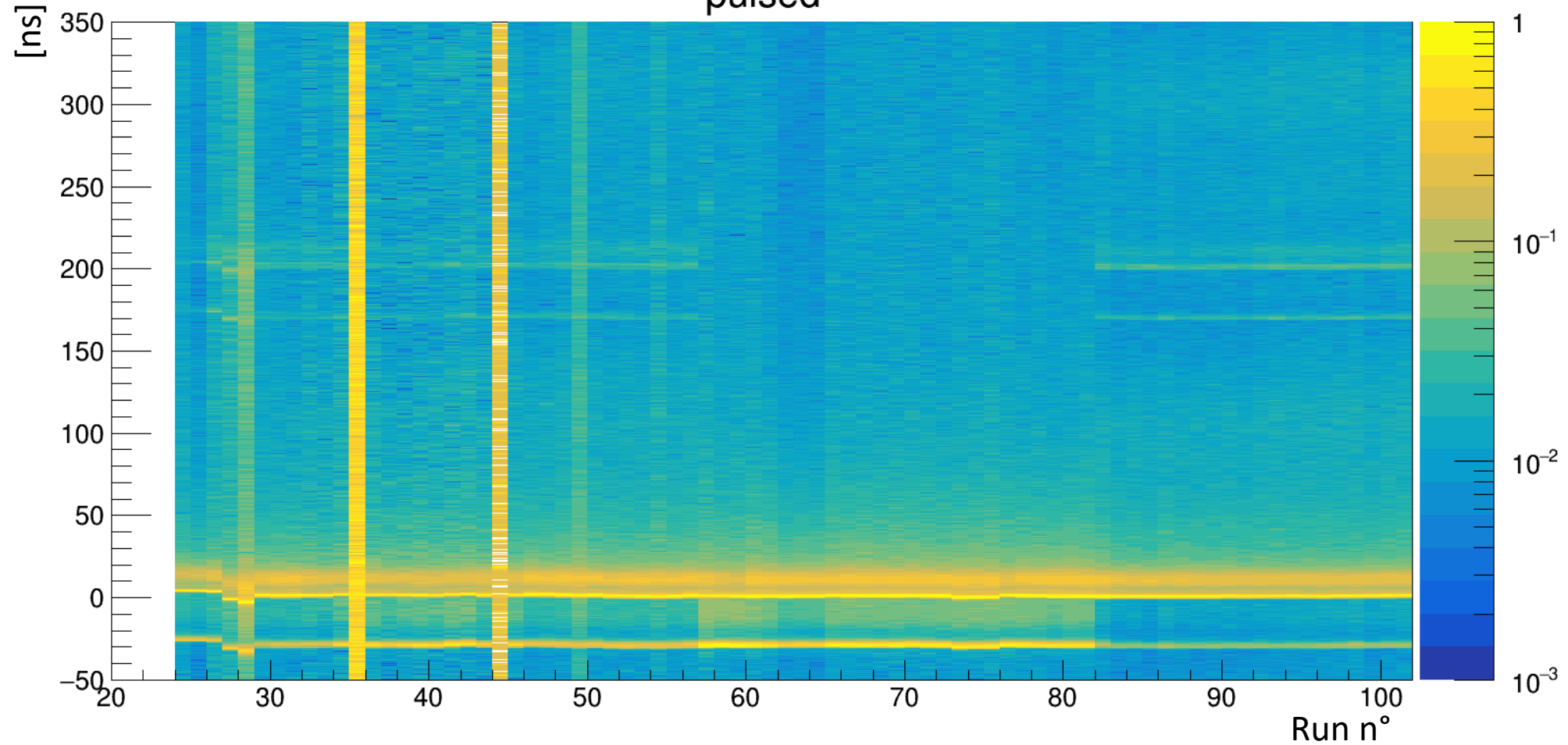
Spectra Ge VS Pulse





2.2 Problèmes de pulsation

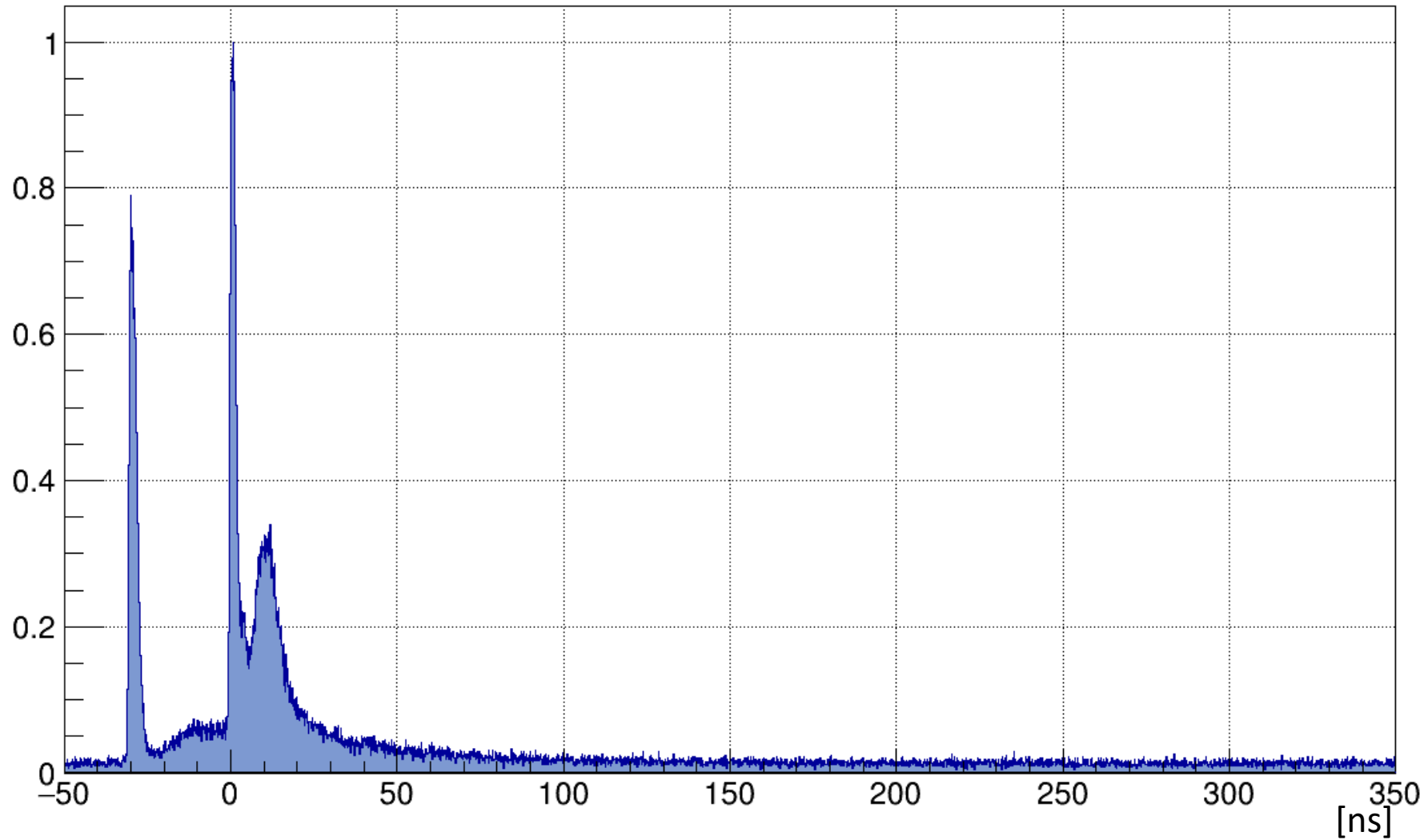
Détecteur de référence VS pulsation pulsed





2.2 Problèmes de pulsation

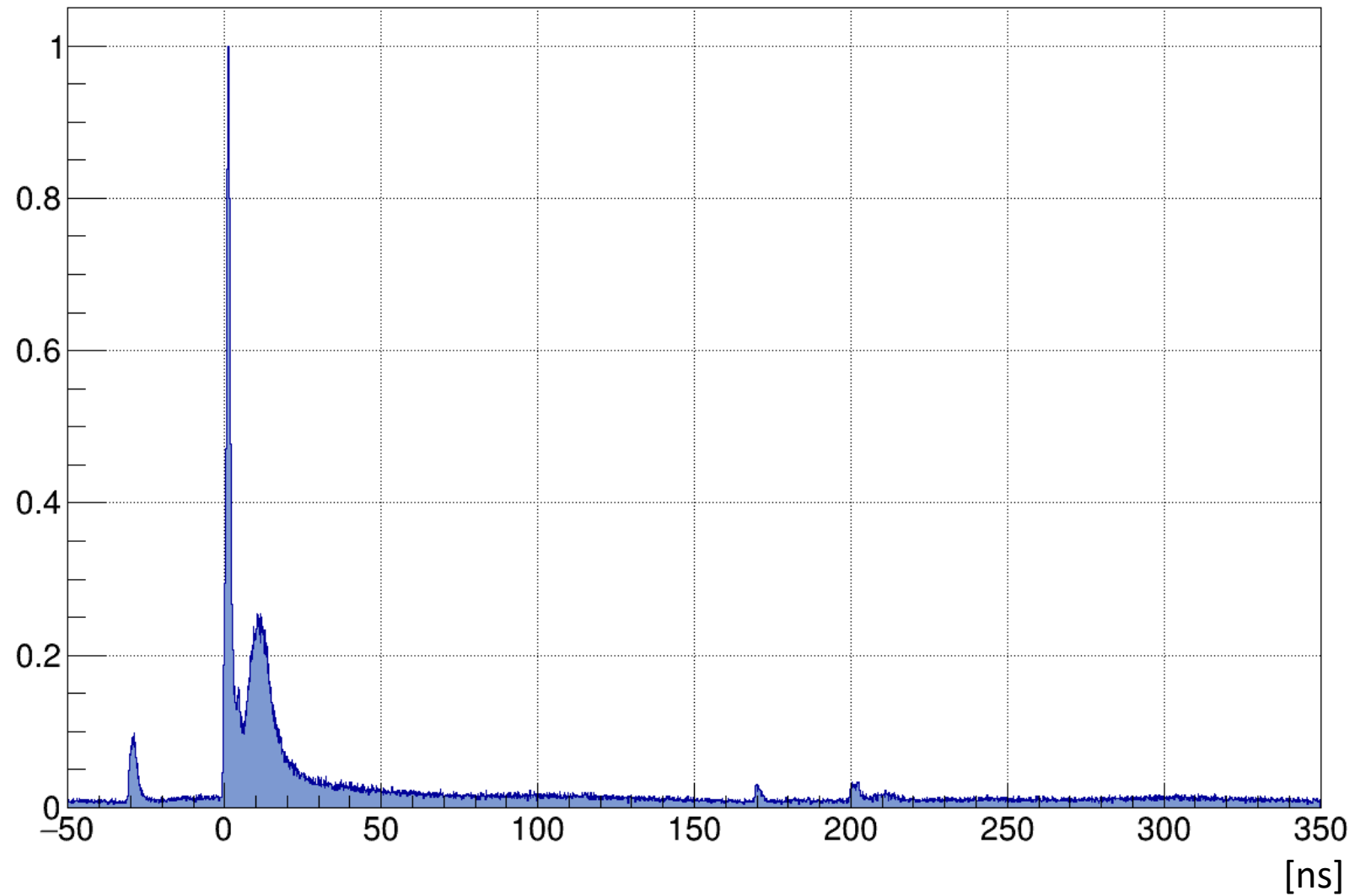
« Bon » run





2.2 Problèmes de pulsation

Deuxième pic à 200 ns





2.2 Problèmes de pulsation

Principal problème : La moitié des données non pulsées !
unpulsed

