LISE^{++} Abrasion-Fission 3EER model : high Z settings

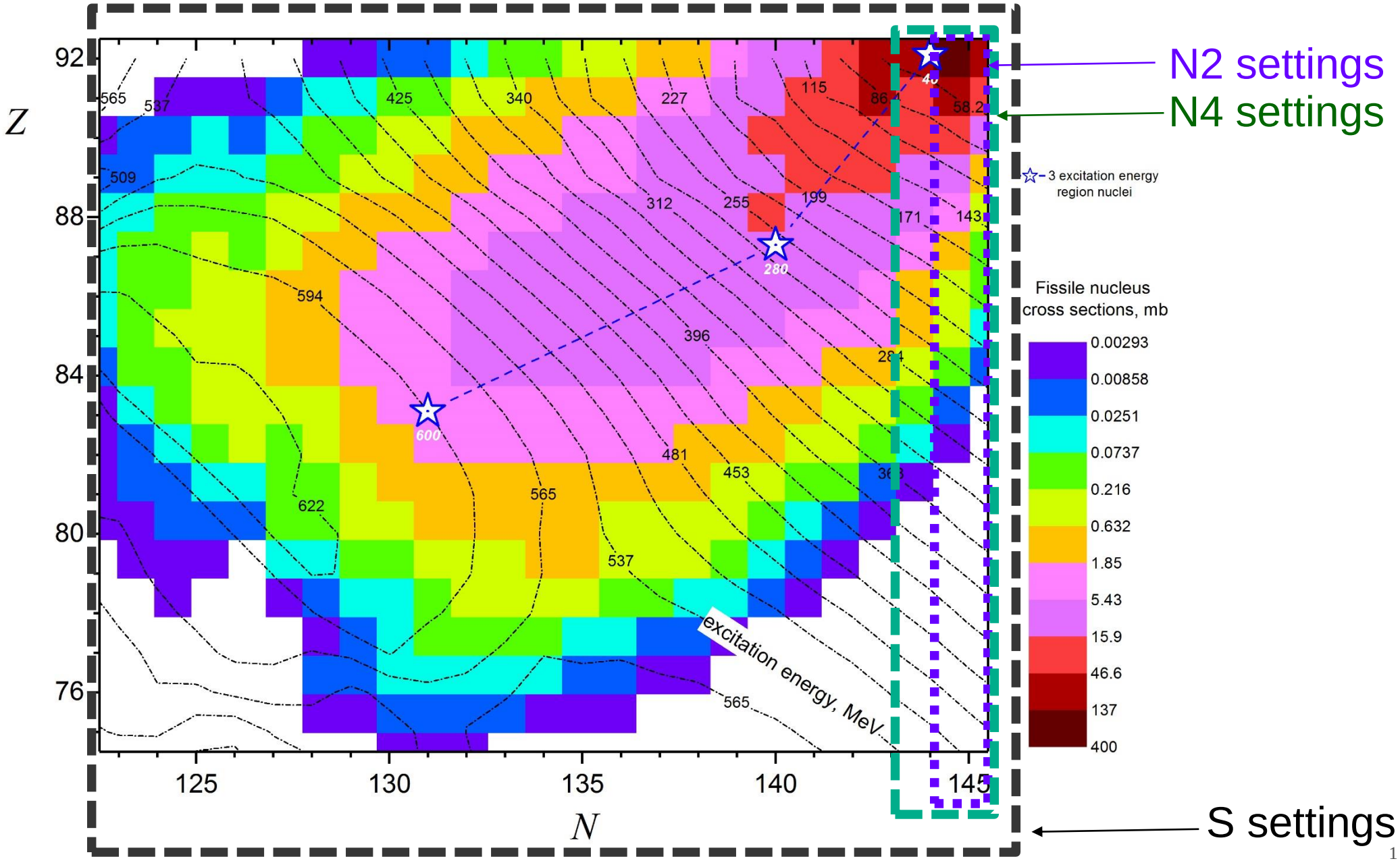
Let's consider 3 different rectangle areas : S, N2, N4

Where

S : standard

N2 : not more than 2 abraded neutrons

N4 : not more than 4 abraded neutrons



LISE++ Abrasion-Fission 3EER model for high Z isotopes

S settings

LISE++ hint for the fissile nucleus from excitation energy	LOW	MIDDLE	HIGH	EM fission
	237U	233Th	223Rn	238U
Excitation energy (MeV)	34.3	93.7	295.6	11
Cross section (mb)	416.2	451.1	740.7	10.8
	use in code **	use in code	use in code	

L+M+H	L+M+H+EM
1608	1618.9

N= 145 143 137

Fission barrier < LOW < 60
60 < MIDDLE < 180
180 < HIGH

Boundary energies for mean values of prefragment excitation energy distributions to split low, middle and high energy regions. Recommendation: 2.3 * dEx , where dEx is excitation energy per abraded nucleon. Default values are equal to 40 & 180 MeV

coef for Zb = 0.8 0.1 < coef < 0.9; recommendation: 0.75

determine low Z (element number) where Abrasion-Ablation stops. Zstop = coef * Zbeam

N4 settings

LISE++ hint for the fissile nucleus from excitation energy	LOW	MIDDLE	HIGH	EM fission
	237U	234Th	229Rn	238U
Excitation energy (MeV)	34.3	81.1	221.8	11
Cross section (mb)	416.2	239.8	19.9	10.8
	use in code **	use in code	use in code	

L+M+H	L+M+H+EM
675.9	686.7

N= 145 144 143

Fission barrier < LOW < 60
60 < MIDDLE < 180
180 < HIGH

Boundary energies for mean values of prefragment excitation energy distributions to split low, middle and high energy regions. Recommendation: 2.3 * dEx , where dEx is excitation energy per abraded nucleon. Default values are equal to 40 & 180 MeV

coef for Zb = 0.9 0.1 < coef <= 1; recommendation: 0.8
coef for Nb = 0.98 0.1 < coef <= 1; recommendation: 0.6

Z_stop = 83
N_stop = 143

determine low Z (element number) where Abrasion-Ablation stops. Zstop = coef * Zbeam

N2 settings

LISE++ hint for the fissile nucleus from excitation energy	LOW	MIDDLE	HIGH	EM fission
	237U	235Th	230At	238U
Excitation energy (MeV)	34.3	81.1	192.1	11
Cross section (mb)	264.1	39.7	1.1	10.8
	use in code **	use in code	use in code	

L+M+H	L+M+H+EM
305	315.8

N= 145 145 145

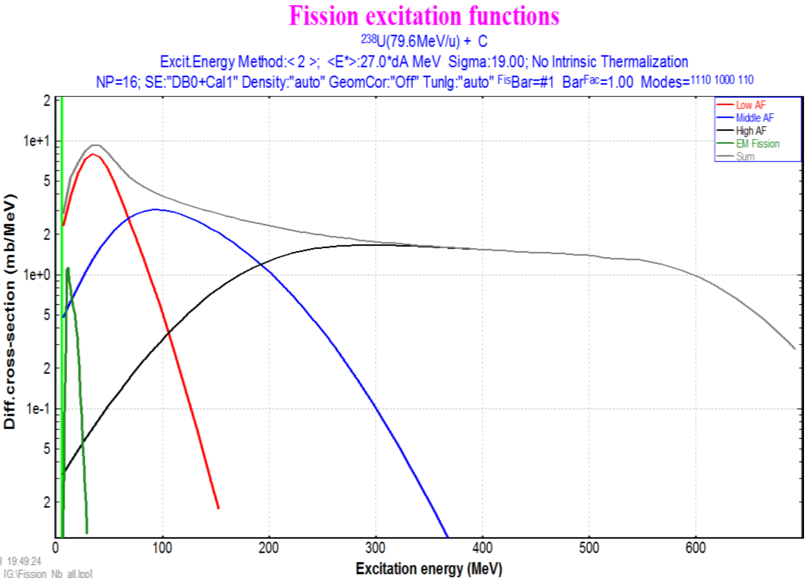
Fission barrier < LOW < 60
60 < MIDDLE < 180
180 < HIGH

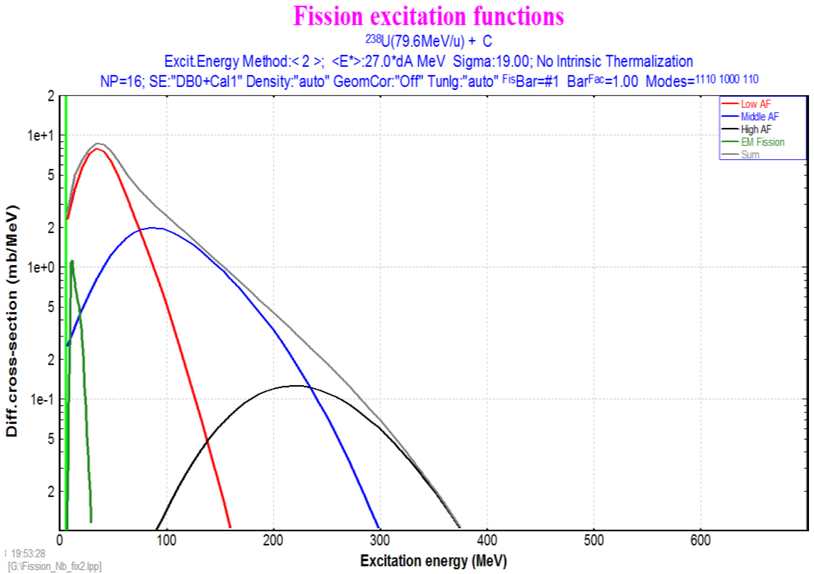
Boundary energies for mean values of prefragment excitation energy distributions to split low, middle and high energy regions. Recommendation: 2.3 * dEx , where dEx is excitation energy per abraded nucleon. Default values are equal to 40 & 180 MeV

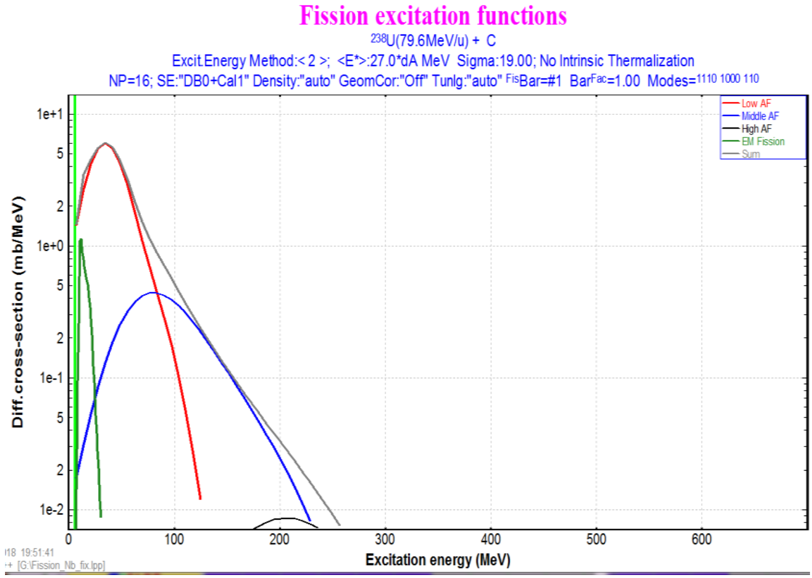
coef for Zb = 0.9 0.1 < coef <= 1; recommendation: 0.8
coef for Nb = 0.996 0.1 < coef <= 1; recommendation: 0.6

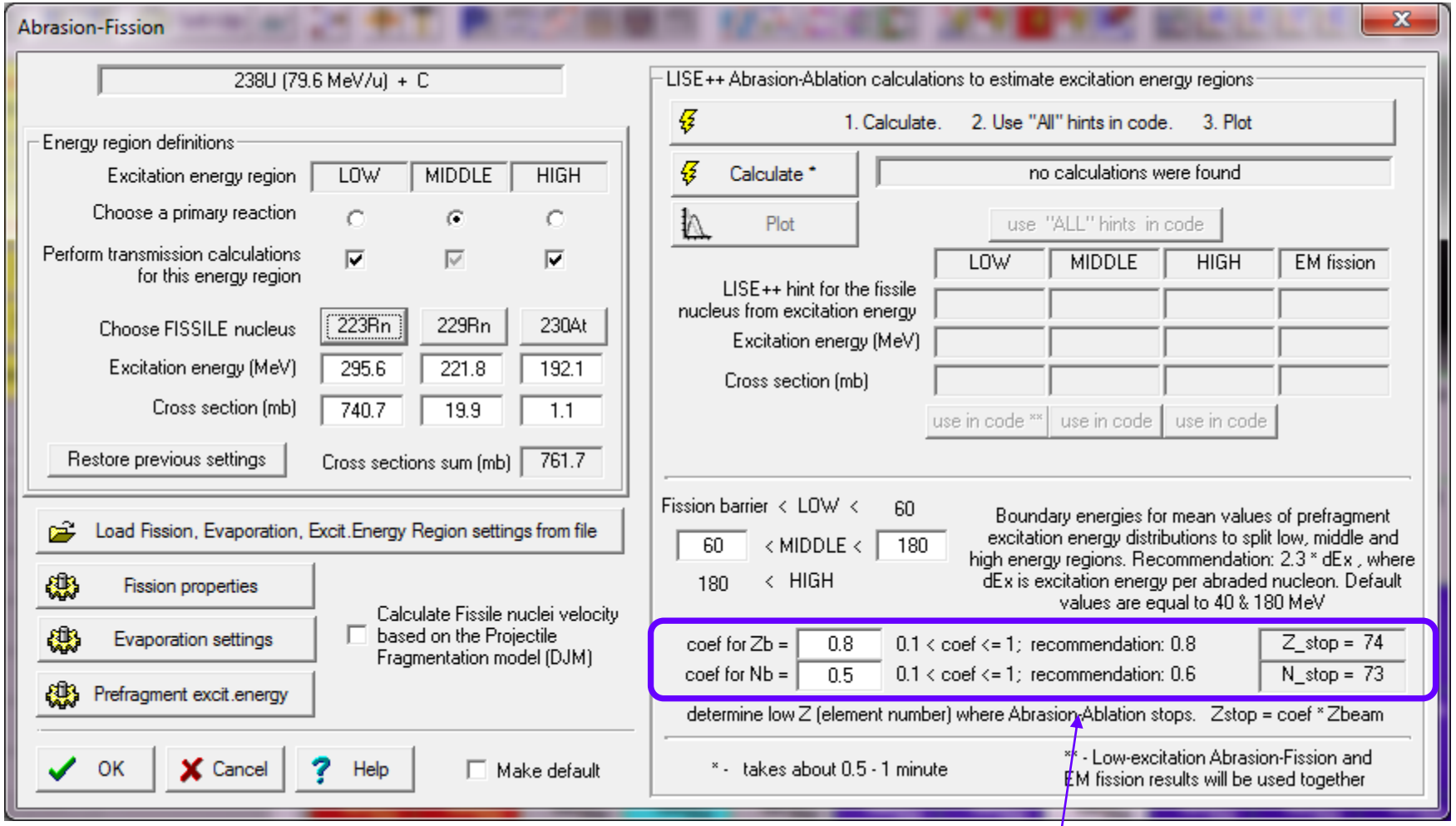
Z_stop = 83
N_stop = 145

determine low Z (element number) where Abrasion-Ablation stops. Z...





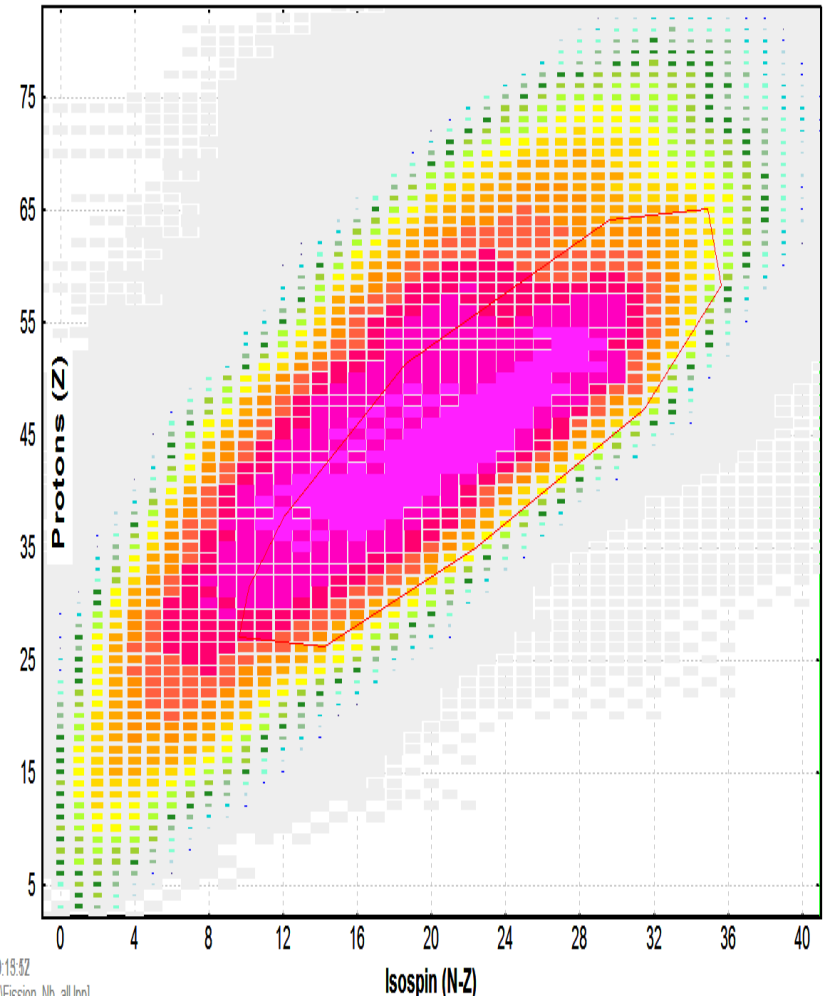




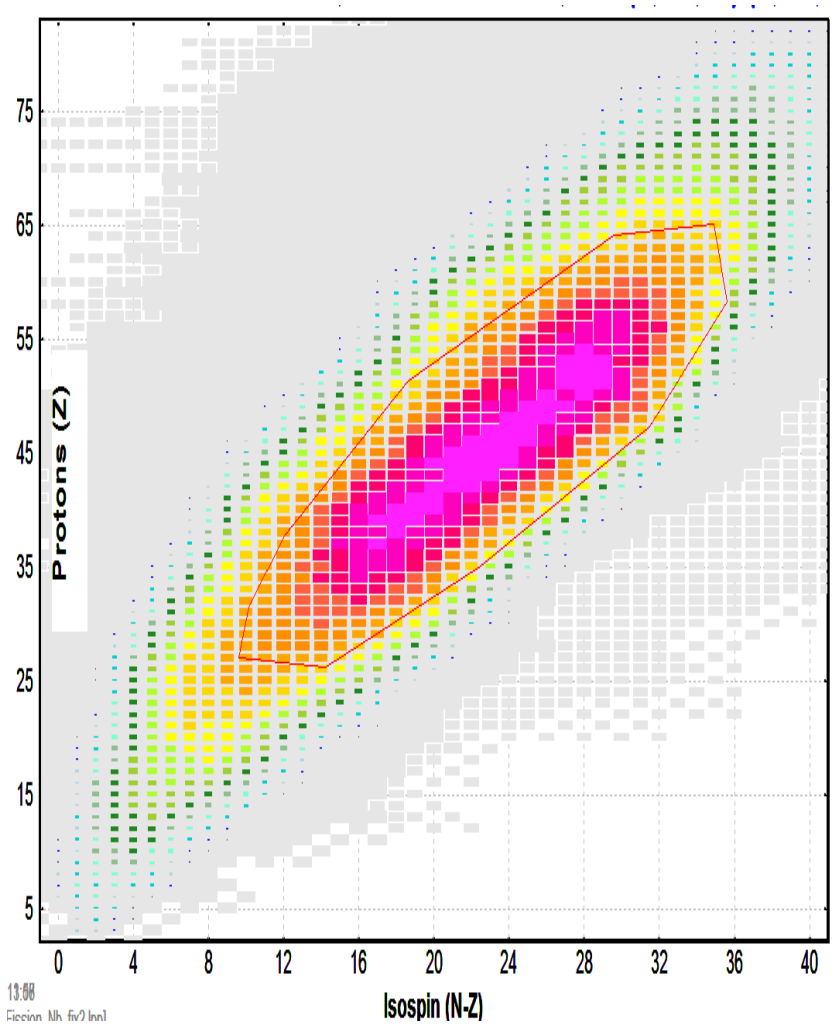
The user can specify the fissile nuclei region in the new version

2D-cross sections plots

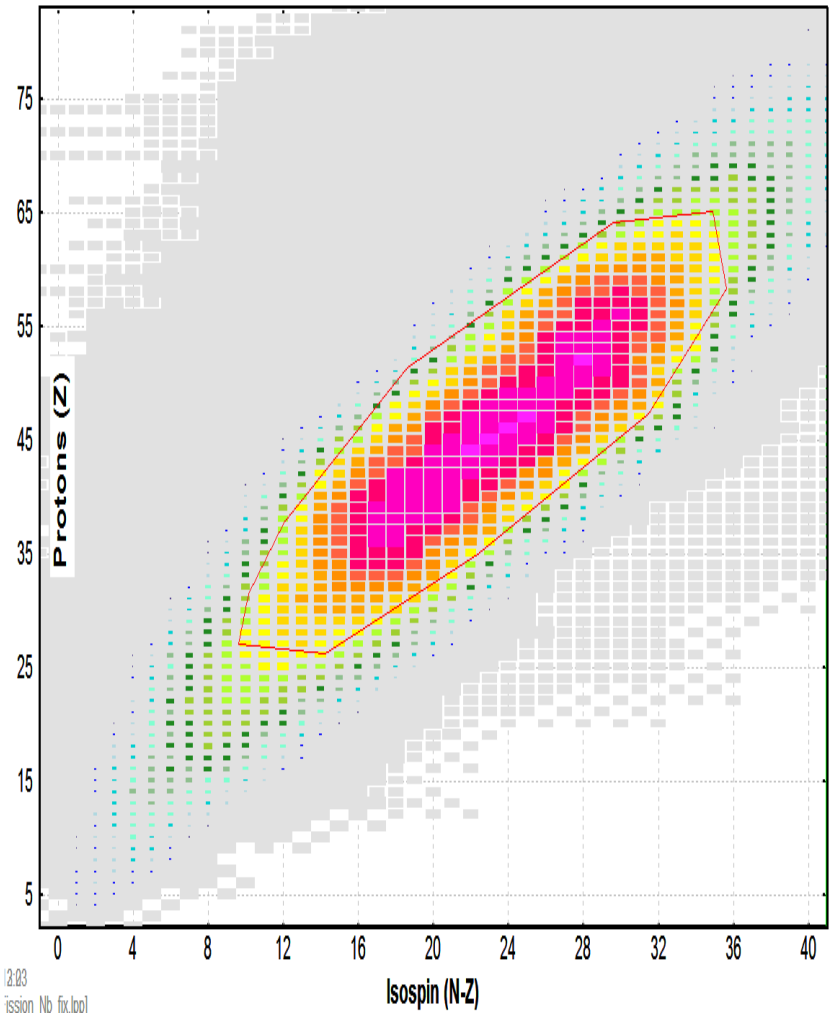
S settings



N4 settings

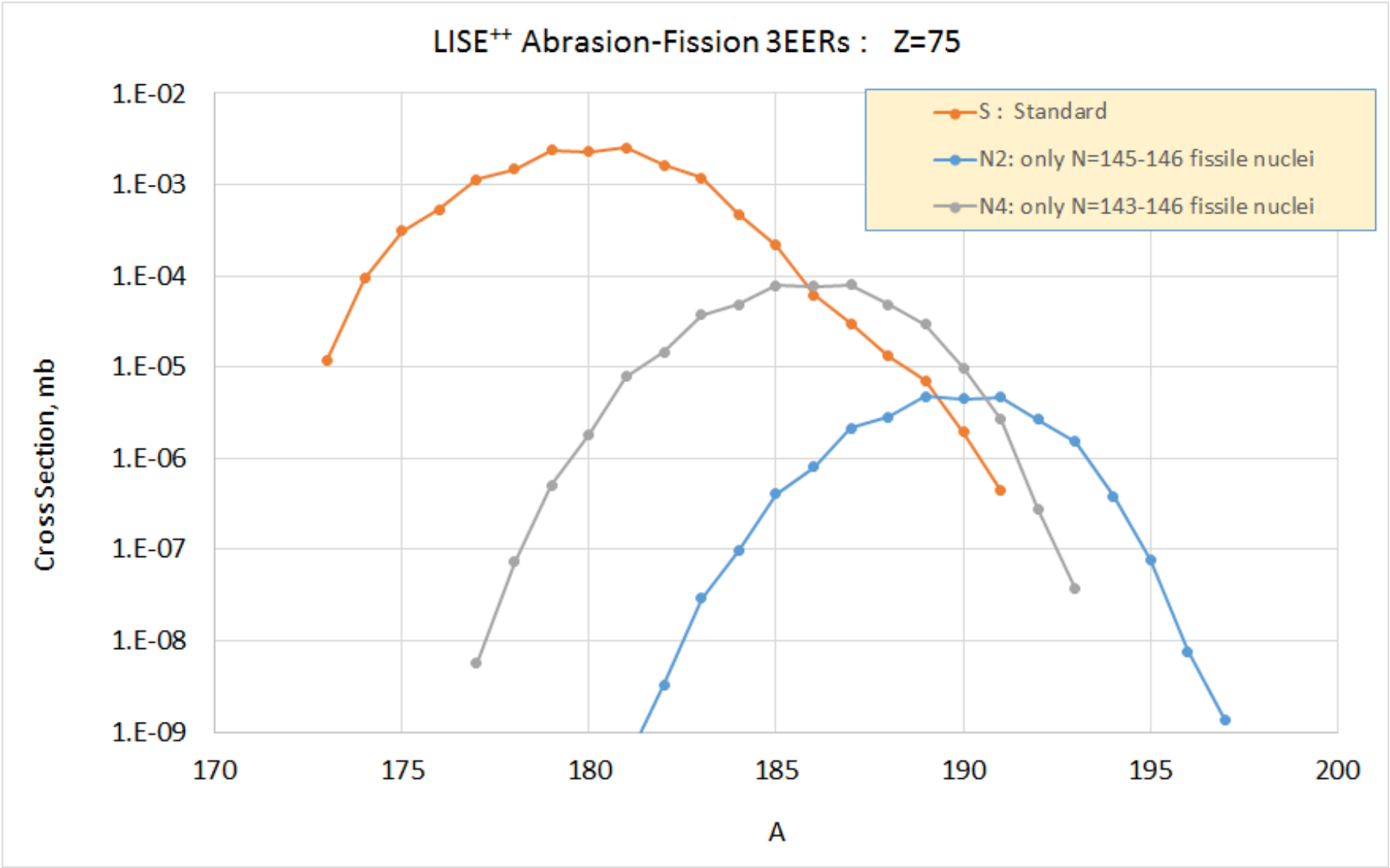


N2 settings



The same are X & Y axis, color scales, contour positions in all plots

Z=75 cross sections



	190Re (Z=75)		
	Regions		
settings	low	midlle	high
N2	0	1.76E-07	4.34E-06
N4	0	9.62E-07	8.90E-06
S	0	1.94E-06	

High regions are responsible for ^{190}Re production

N1 settings

N1 settings

	LOW	MIDDLE	HIGH	EM fission
LISE++ hint for the fissile nucleus from excitation energy	237Pa	236Th	38Si	238U
Excitation energy (MeV)	39.6	70.3	192.1	11
Cross section (mb)	25.8	8.7	0.2	10.8
L+M+H 34.7 / L+M+H+EM 45.5	use in code **	use in code	use in code	

N= 146 146

Fission barrier < LOW < 60

60 < MIDDLE < 180

180 < HIGH

Boundary energies for mean values of prefragment excitation energy distributions to split low, middle and high energy regions. Recommendation: 2.3 * dEx , where dEx is excitation energy per abraded nucleon. Default values are equal to 40 & 180 MeV

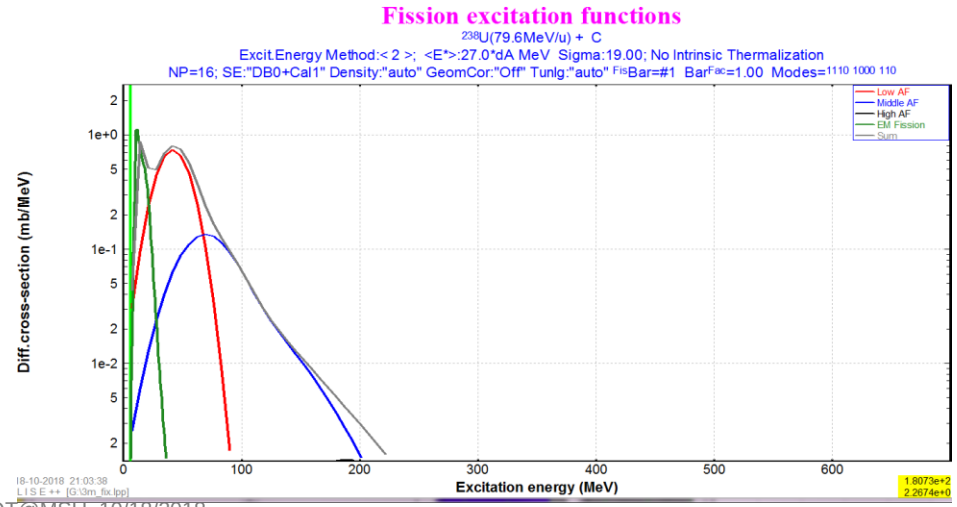
coef for Zb = 0.9 0.1 < coef <= 1; recommendation: 0.8

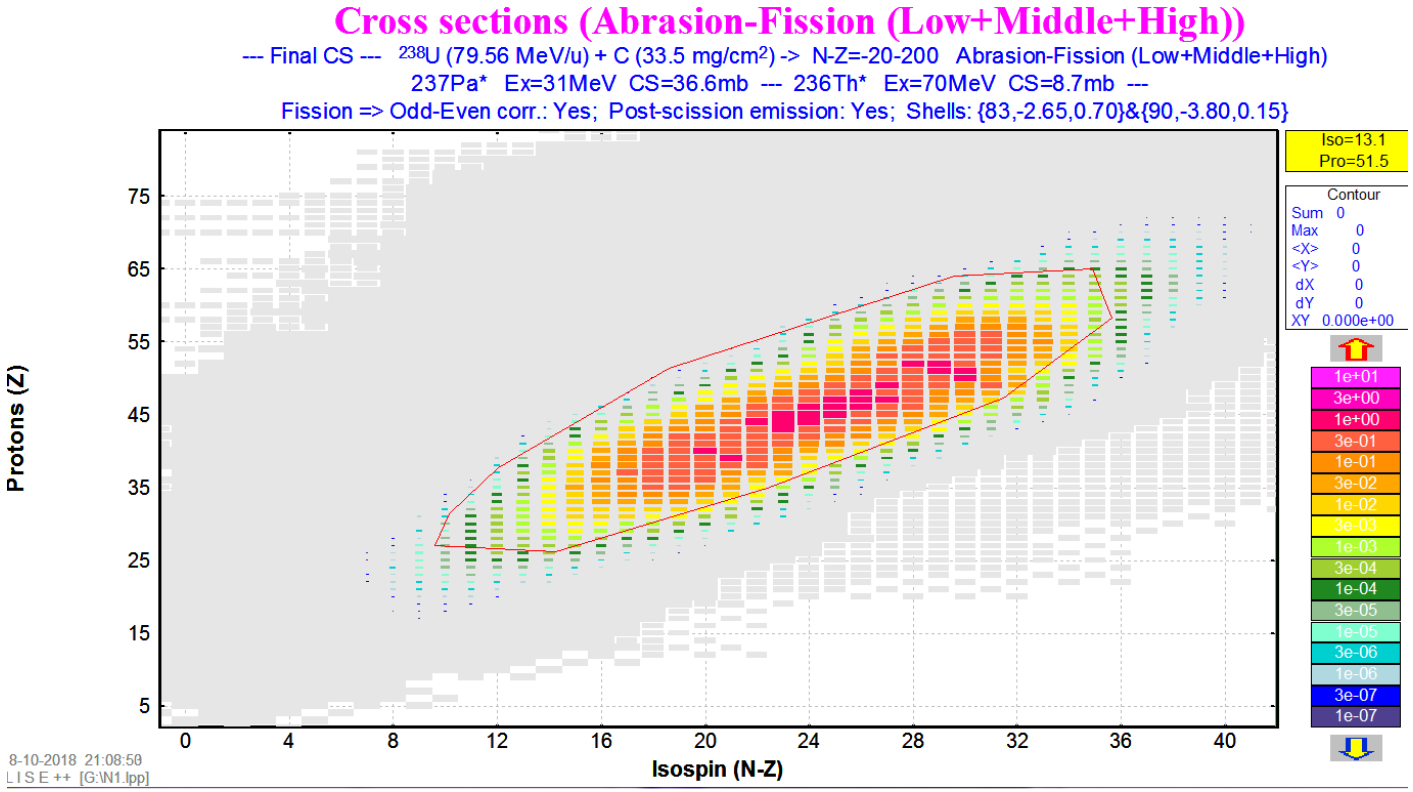
coef for Nb = 0.999 0.1 < coef <= 1; recommendation: 0.6

Z_stop = 83

N_stop = 146

determine low Z (element number) where Abrasion-Ablation stops. Zstop = coef * Zbeam





The same are X & Y axis, color scales, contour positions as in previous all plots

New “3H” settings based on previous High EERs

“3H” settings

Taking only High EERs from the **S,N2,N4** settings to construct the new “**3H**” configuration

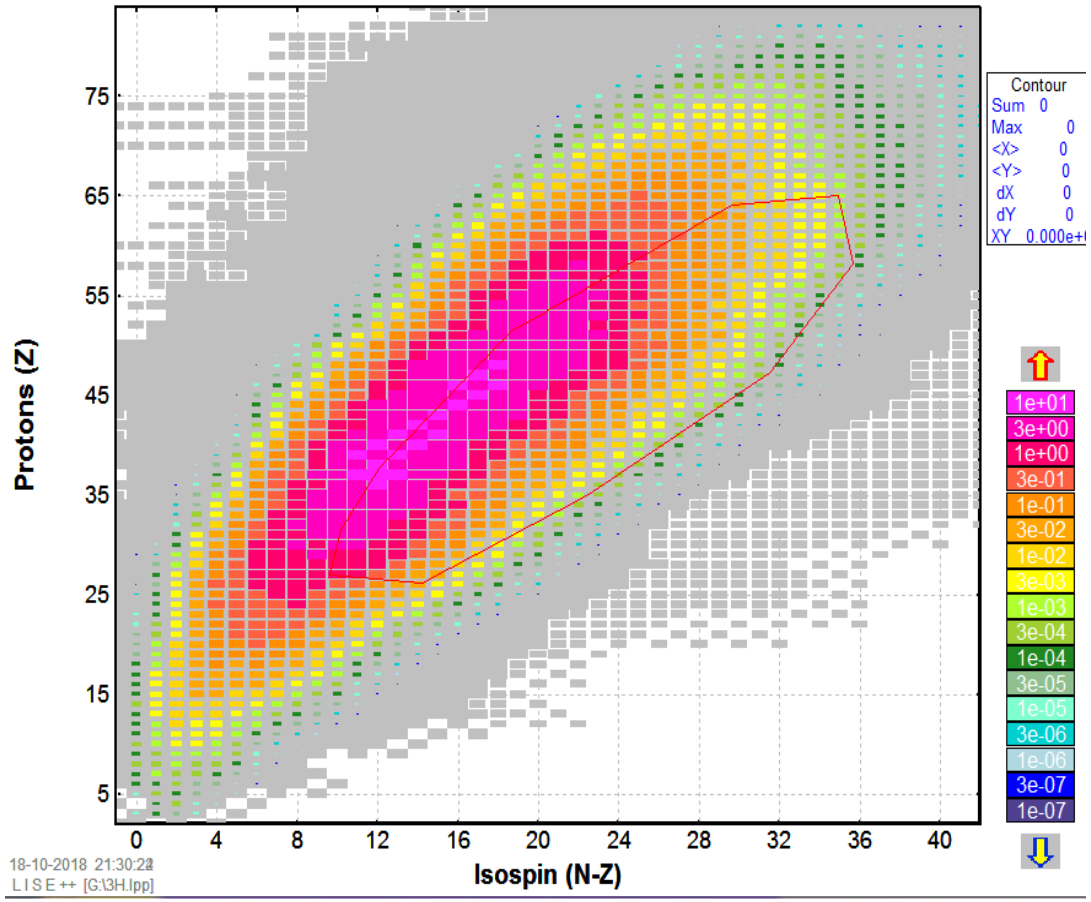
S-h N4-h N2-h

Energy region definitions

	LOW	MIDDLE	HIGH
Excitation energy region			
Choose a primary reaction	○	◉	○
Perform transmission calculations for this energy region	☑	☑	☑
Choose FISSILE nucleus	223Rn	229Rn	230At
Excitation energy (MeV)	295.6	221.8	192.1
Cross section (mb)	740.7	19.9	1.1

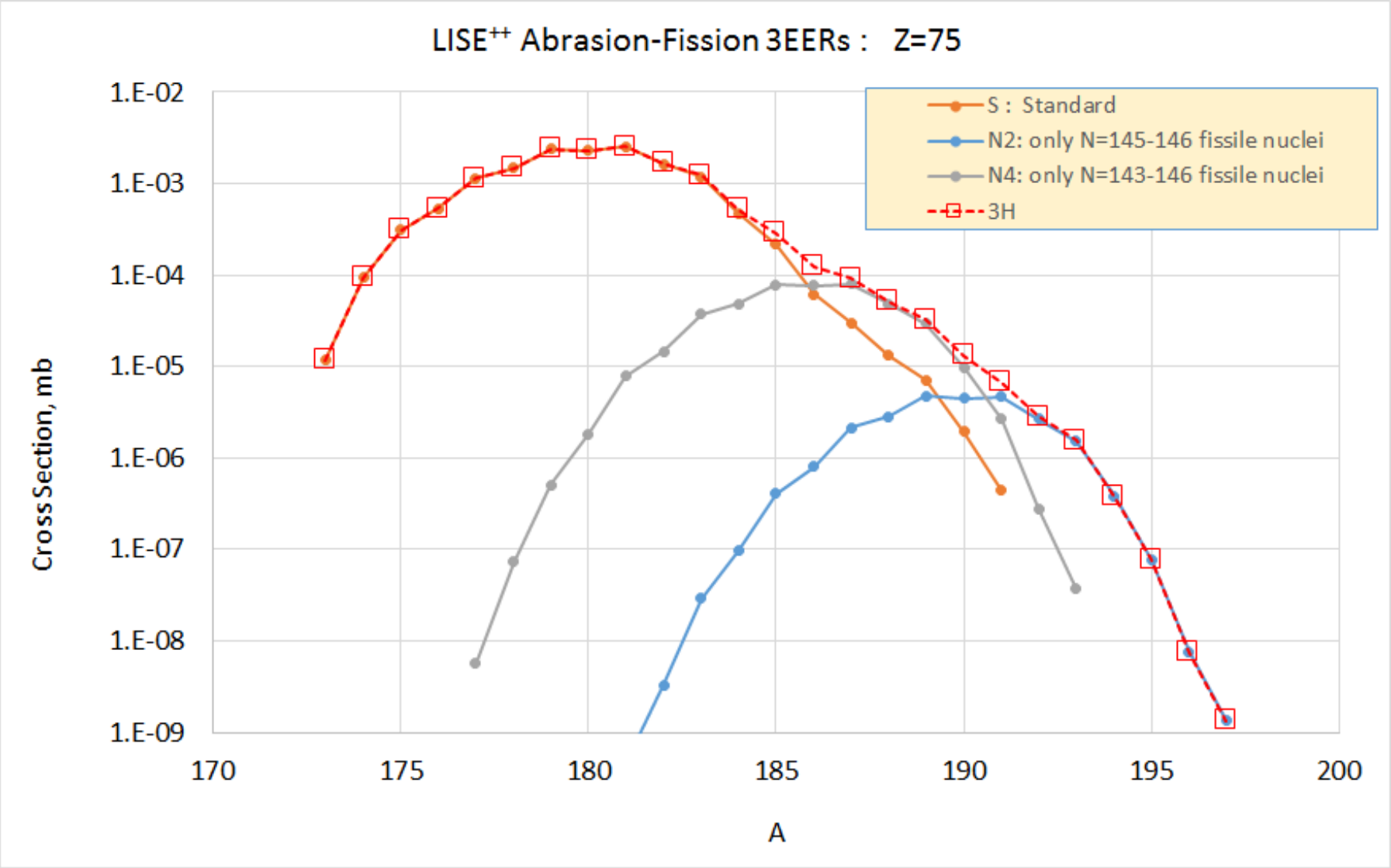
Restore previous settings Cross sections sum (mb) 761.7

N= 137 143 145



The same are X & Y axis, color scales, contour positions as in previous all plots

“3H“ settings for Z=75

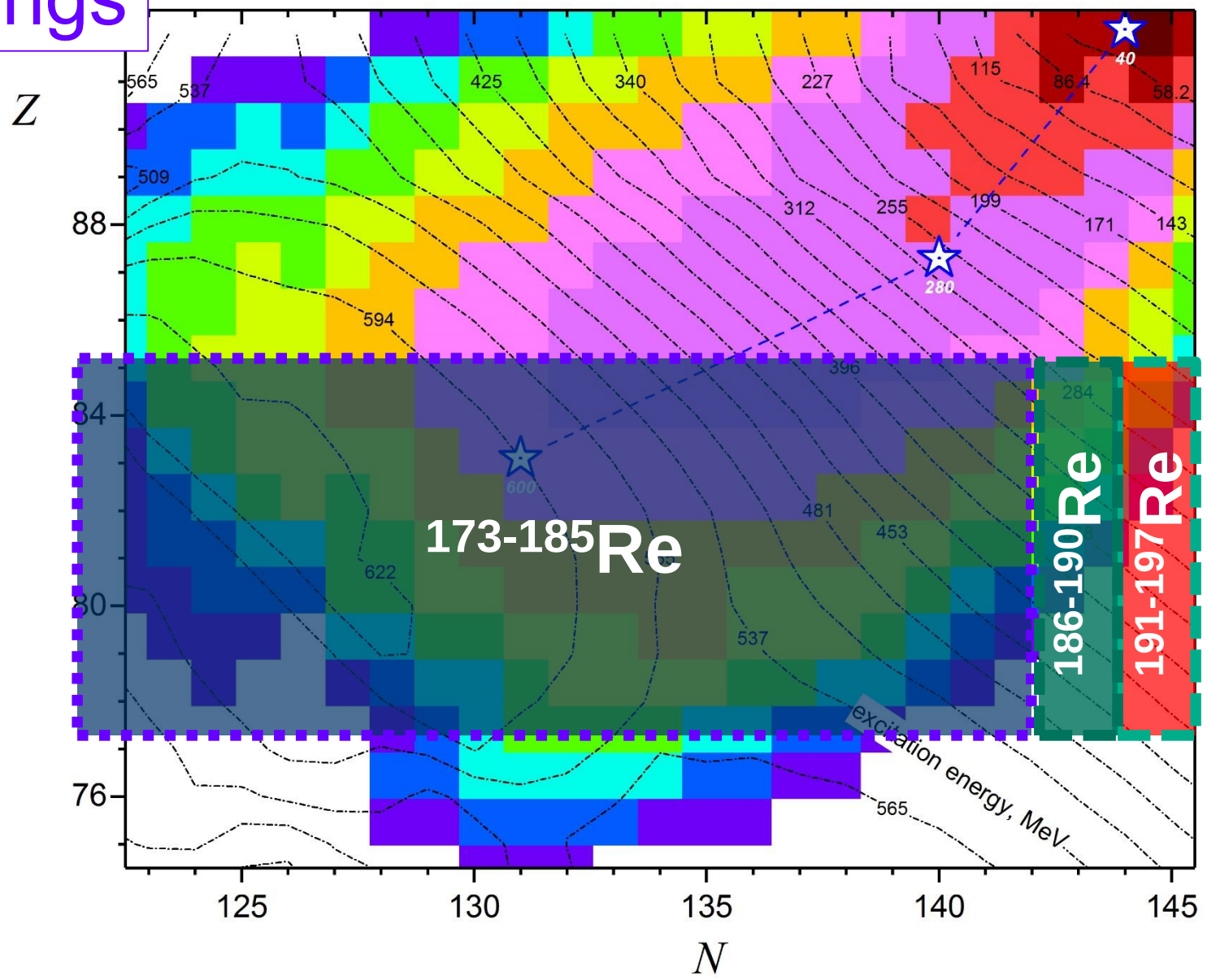


High excitation energy regions are responsible for Z=75 isotopes production!

May be use N5 settings instead N4?

Fissile nuclei topology for Z=75 isotopes production

"3H" settings



Fissile nuclei topology