

**v.17.8**  
09/18/24

- Revision of angular acceptance cut of fission products
- Update of angular straggling contribution: non-achromatic locations
- Pickup option in AA [under development]
- All modifications : from 17.7 to 17.8





This example materials are located in vertical non-achromatic plane

FM2 slits

A thick wedge after FM2 slits

Global matrix

	1. X	2. T	3. Y	4. P	5. L	6. D
1. X	1.8383	-1.99e-05	0	0	0	-55.865
2. T	-0.5531	0.544	0	0	0	-0.0016
3. Y	0	0	0.1047	0.6284	0	0
4. P	0	0	-1.5867	0.0299	0	0
5. L	3.0906	-3.0389	0	0	1	-0.6842
6. D	0	0	0	0	0	1
	/[mm]	/[mrad]	/[mm]	/[mrad]	/[mm]	/[%]

Det= 1.0002

Thickness (original)

13.452915 mm

12 g/cm<sup>2</sup>

Atoms / cm<sup>2</sup> 1.14e+23

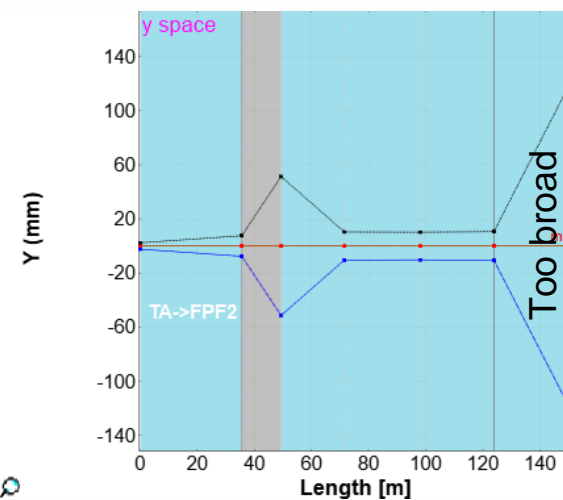
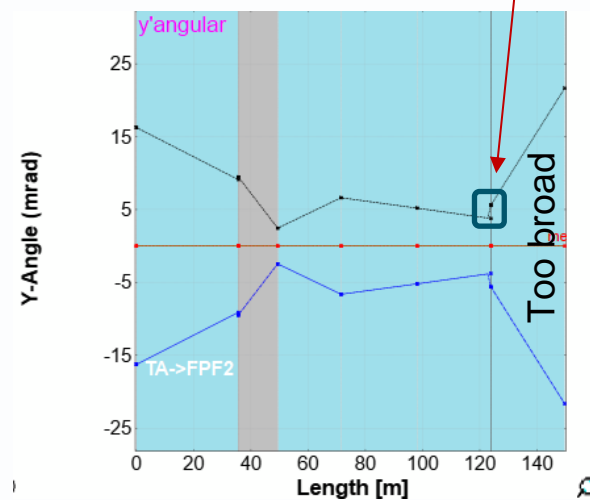
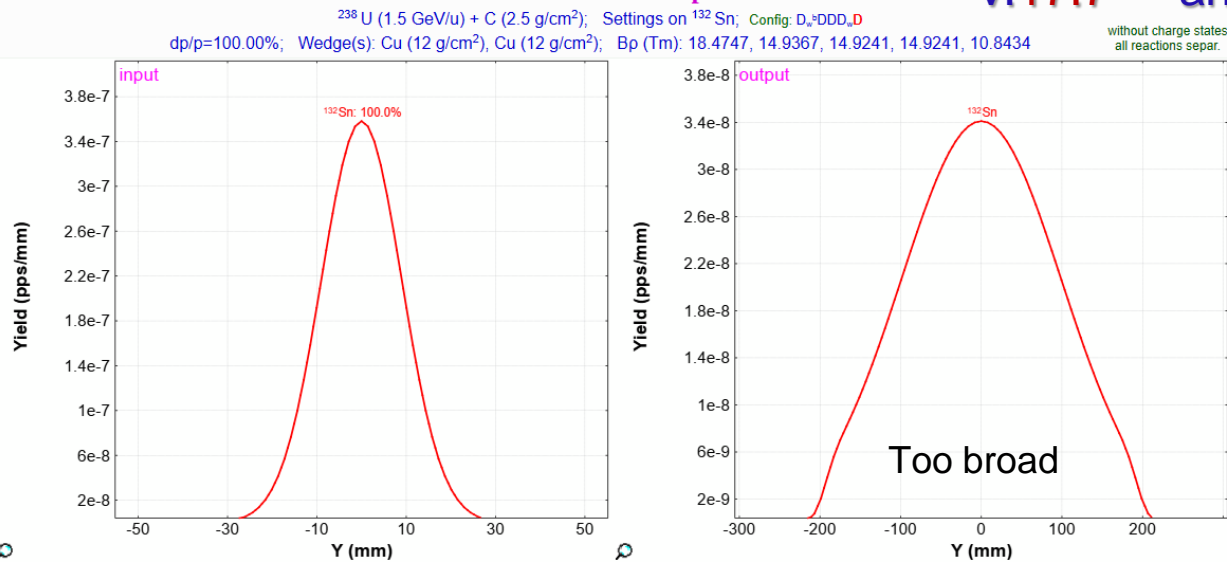
d/Range (frag) 0.497

MC solution gives after FMF2->FMF3  
 $\sigma(Y) = 10.9$  mm,  $\sigma(Y') = 4.1$  mrad  
 (see next slide)

FMF2->FMF3 → Yspace

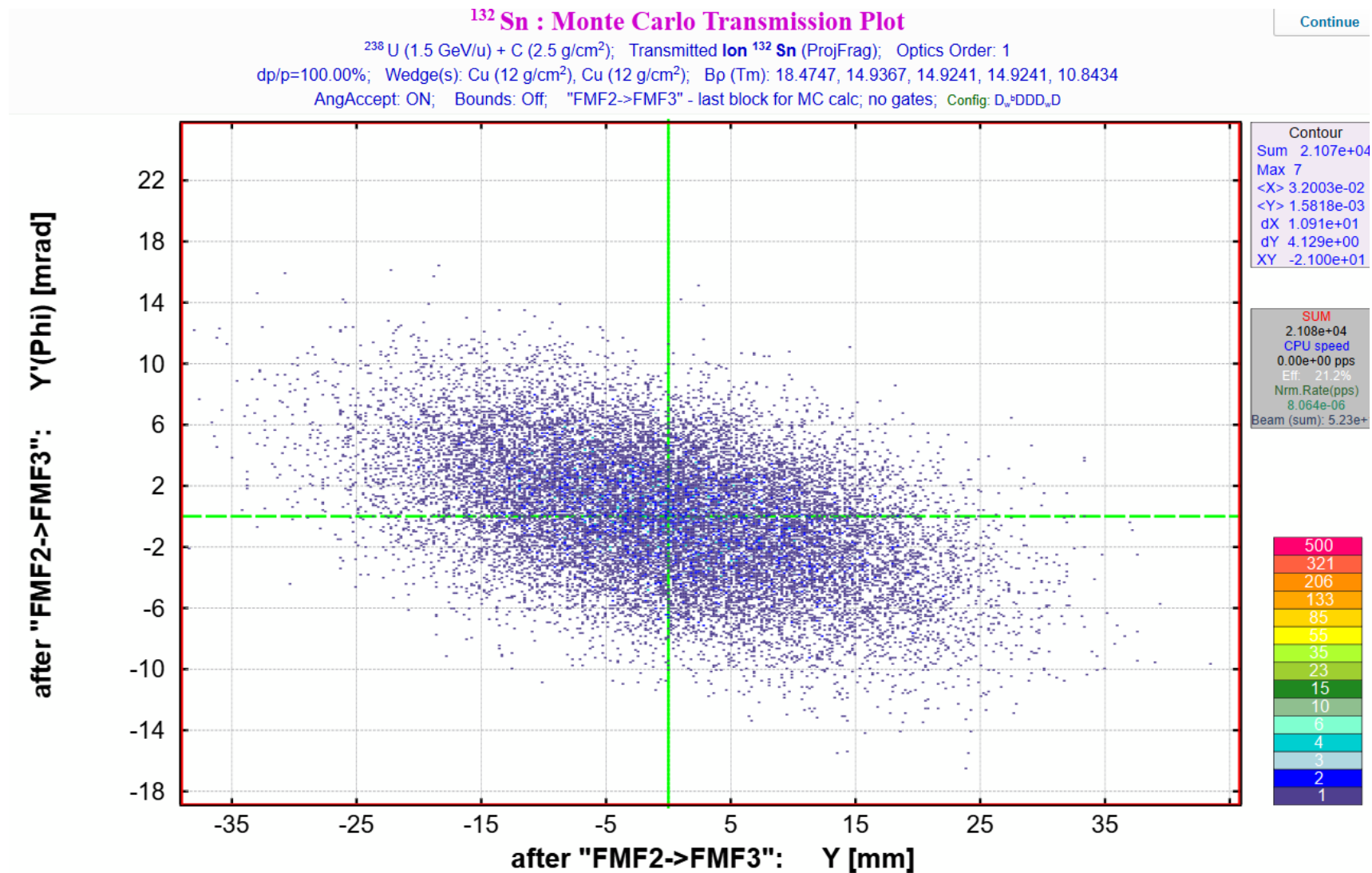
v.17.7 - analytical solution

Ang.staggling impact



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v.17.7 - MC solution



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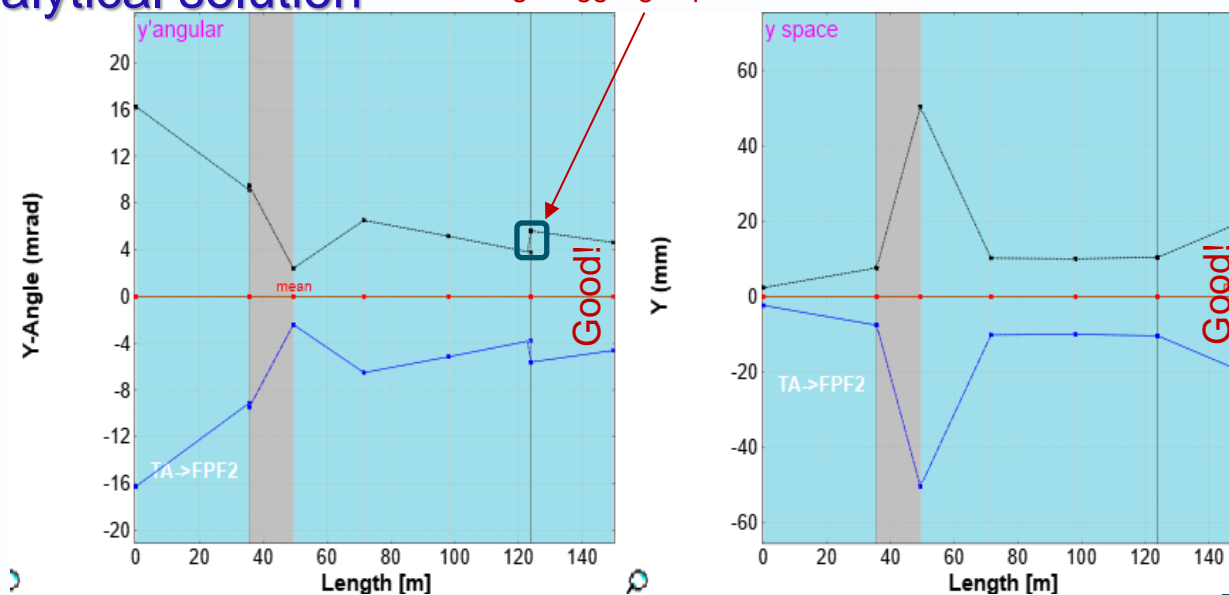
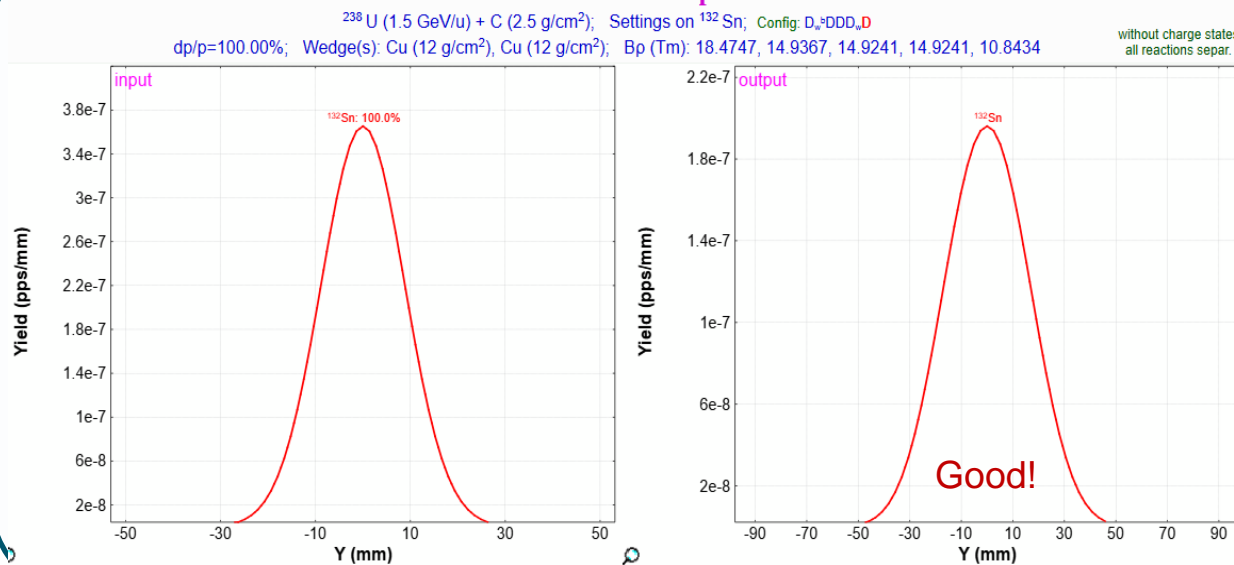
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FMF2->FMF3 → Yspace

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E\* distribution is based on INCL (BeAgle) charge-exchange results

Excitation Energy of prefragment

A: 65, Element: Ti, Z: 22

Reaction:  $^{82}\text{Se}$  (228.0 MeV/u) + C

Excitation Energy in the code = 255 MeV

Abrasion model:  Geometrical: J.Gosset et al., PRC 16 (1977) 629

Excitation Energy Models:  3. Parametrized Gaussian distribution

[beta] Use one-nucleon pickup contribution (charge exchange)

Global Abrasion Cross-Section Factors

1. J.W.Wilson, L.W.Towsend, F.F.Badavi, NIM B18 (1987) 225-231

Excitation Energy = 112.34 MeV  
Standard deviation = 39.58 MeV  
 $\gamma = 0.95$  MeV/fm<sup>2</sup>  
 $\sigma = 9.6$  \*d<sub>abr</sub><sup>1/2</sup> [MeV]

Correction factor of Surface distortion excitatic

$$f = 1 + c_1 * d_{abr} / A_p + c_2 * (d_{abr} / A_p)^2$$

c<sub>1</sub> = 1.5, c<sub>2</sub> = 2.5, f = 1.42

2. J.-J.Gaimard and K.-H.Schmidt, NPA531 (1991) 709

Hole depth (MeV) <E\*> = 13.36 \*d<sub>abr</sub> [MeV]  
 $\sigma(E^*) = 9.43$  \*d<sub>abr</sub><sup>1/2</sup> [MeV]

3. Parametrized Gaussian distribution -- simplified cor

<E*>	$\sigma(E^*) =$
0 *d <sub>abr</sub> <sup>2</sup> +	0 *d <sub>abr</sub> +
15 *d <sub>abr</sub> +	9.6 *d <sub>abr</sub> <sup>1/2</sup> +
0 [MeV]	0 [MeV]

4. Exponential <T> excitation-energy distribution -- L

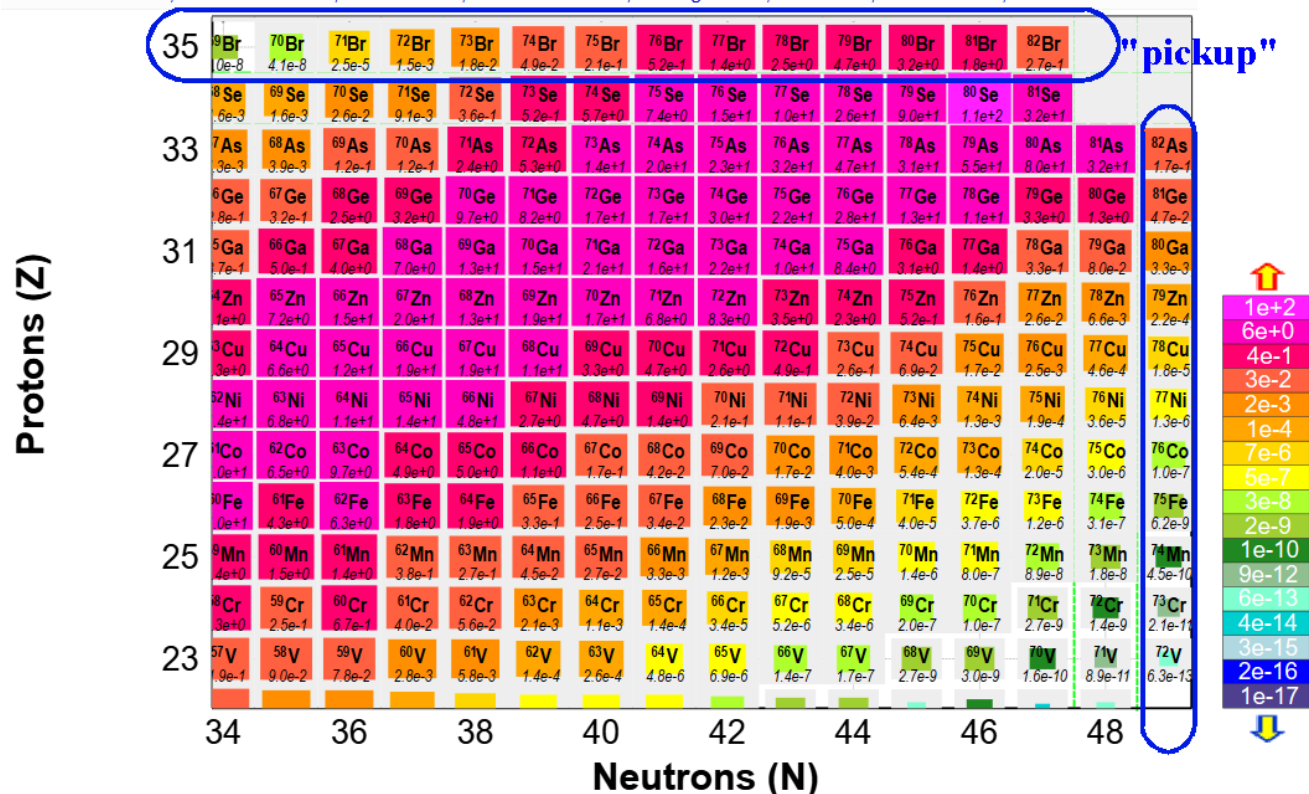
Mean Temperature (MeV)

base + k<sub>1</sub>\*d<sub>Nabr</sub> + k<sub>2</sub>\*d<sub>Zabr</sub>

## Cross sections (Projectile Fragmentation)

$^{82}\text{Se} + \text{C} \rightarrow \text{N}=0-200$  Method: 0 - Abrasion/Ablation v.6.5.1

E\* method: <2>; <E\*>: (0.0 15.00 0.00e+00);  $\sigma(E)$ : (0.0 9.60 0.00e+00); No Intrin.Thermaliztn; LimitTemp: No  
NP=32; SE: "DB0+Cal3"; Den: "auto"; GeomCor: "On"; Tunlg: "auto"; FisBar= #1; Bar<sup>Fac</sup>= 1.00; Modes=<sup>1010 1000 110</sup>



17.7.1	07/27/24	fission case: using any optic block with angular acceptance for Brho-tuning (M.H.)
17.7.2	08/05/24	B_eff values in d_Apf_auto dialog
17.7.3	08/29/24	Excitation energy parameters more details in Cross-section plots
17.7.4	09/07/24	Revision of LimitingTemperature option (Apf Ex dialog)
17.7.5	09/11/24	results-file : update for slit size
17.7.6	09/11/24	elapsed time includes msec
17.7.7	09/13/24	1D-plot Legend : bottom version
17.7.8	09/13/24	clear all calculation and reactions with clicking right mouse button on the rectangle in beam setup area
17.7.9	09/13/24	Clickable Label : right button signal
17.7.10	09/13/24	<b>Pickup option in AA : class, dialog, ini-file, lise-file</b>
17.7.11	09/15/24	FireBall [FB] moving to const Ce*
17.7.12	09/15/24	update o_AA and o_AA_manage for FB.Pickup
17.7.13	09/15/24	o_AA_compare for FissionBarrier and FB.Pickup
17.7.14	09/15/24	L_init_options: correlation between opt->AA_show & opt->CS_plot
17.7.15	09/15/24	correction in sigma label in MC contour table
17.7.16	09/16/24	Preference: new display option "Global transmission" instead "reaction field"
17.7.17	09/16/24	rebuild TR_A & TR_AcceptAn for debugging
17.7.18	09/17/24	<b>Serious revision for fission case in TR_AcceptAn</b>
17.7.19	09/18/24	<b>Revision for angular straggling contribution to ang.distribution taking defocusing into account</b>
17.7.20	09/18/24	64 - default value for wedge calculation