

version 8.3.14

❖ Update of the Kinematics calculator

Increase of the Kinematics plot distribution dimension

Transportation of some dialog parameters to “Static”

❖ Three possible reaction places

entrance of the target

middle of the target

exit of the target

❖ New Option: For Kinematics plots use energy values

after reaction

at entrance of detectors

Kinematics calculator (relativistic)

Reactions

- TWO BODY reaction B (A, C) D
- SCATTERING B (A, C=A) D=B
- BREAKUP (FISSION) x(A, C D) x (gamma-emission)

Use Mott's scattering

Reaction takes place at the

- ENTRANCE of the target
- MIDDLE of the target
- EXIT of the target

Participants

		ME [MeV]	Excitation Energy	E(CM) = 198.72 MeV
A	Beam	48Ca	-44.21	0
B	Target	248Cm	67.39	0
C *	Fragment	48Ca	-44.21	0
D *	Residual	248Cm	67.39	0

Beam energy = 5.0 MeV/u
Intensity = 1.75e+5 pnA
Target thickness = 0.4 mg/cm2
Q-value = 0.00 MeV

Set-up

Search an angle in CM

- from 0 degrees and up
- from 180 degrees and down

	fragment (C)	residual (D)
R =	100 cm	100
w =	1 cm	1
h =	2 cm	2

Angle (deg) = 120 25.163 129.669 50.331
fragment (C) residual (D) fragment (C) residual (D)

Calculations

	LAB	CM	
Counting in monitor =	3.07e+4	1.39e+5	pps
Differential Cross Section =	144	653	180 180 mb/sr
Energy after reaction =	2.74 <-	0.426	3.472 0.13 MeV/u**
Energy at the entrance of detectors =	2.68 <-	0.412	MeV/u (** for gamma [MeV])
Maximum Angle =	180.00	90.00	deg
Solid Angle =	0.2	0.2	0.16 0.724 msr
delta Theta =	0.57	0.57	0.52 1.1 deg

For Kinematics Plots use energy values

- after reaction
- at entrance of detectors

Kinematics plots
Rutherford plot
2D fragment plot (Monte Carlo)

Quit Help

The sign « <- » shows that the fragment moves in direction backward to the projectile.

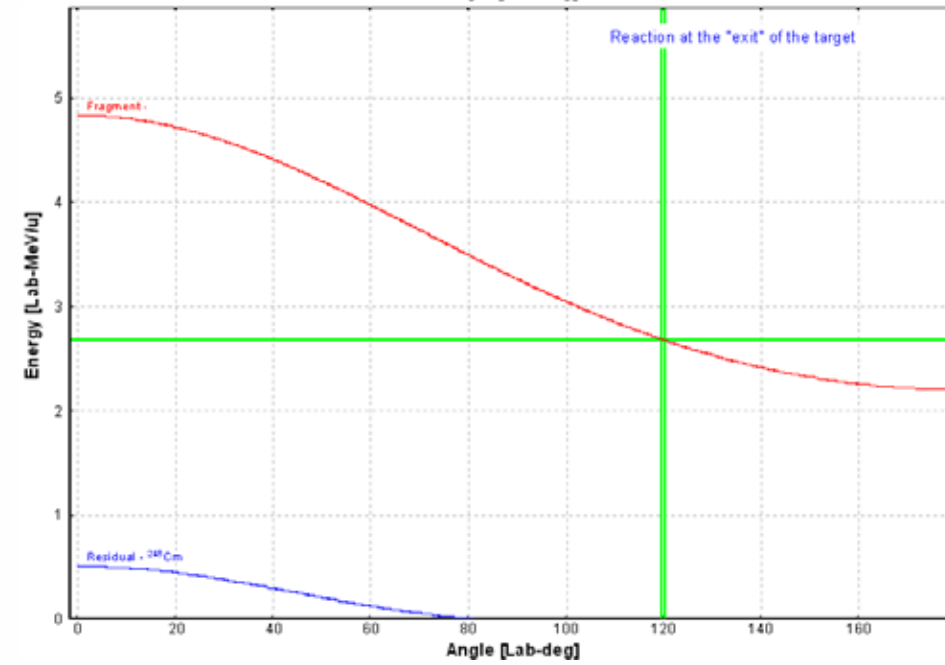
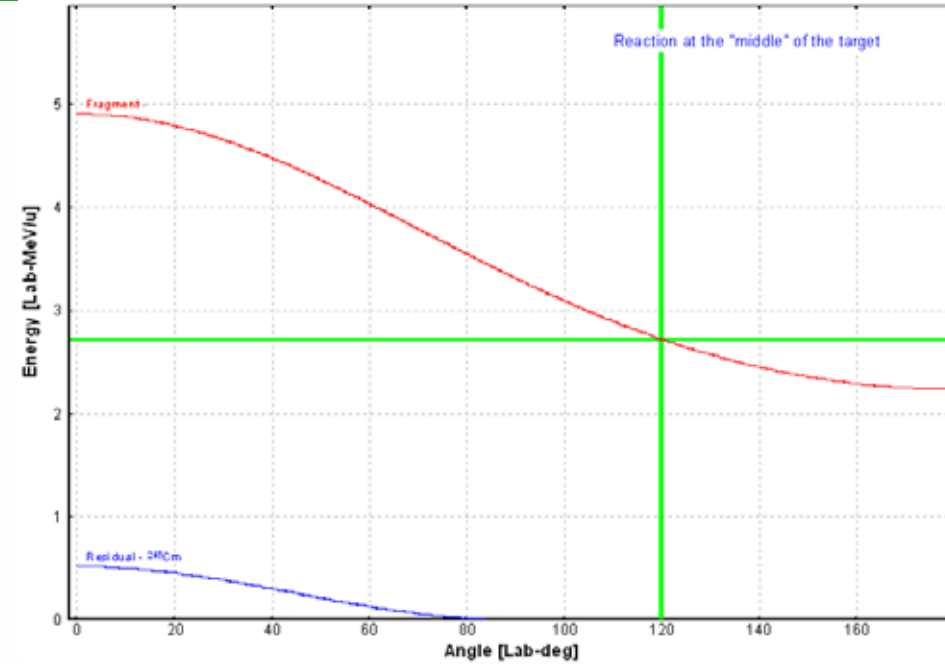
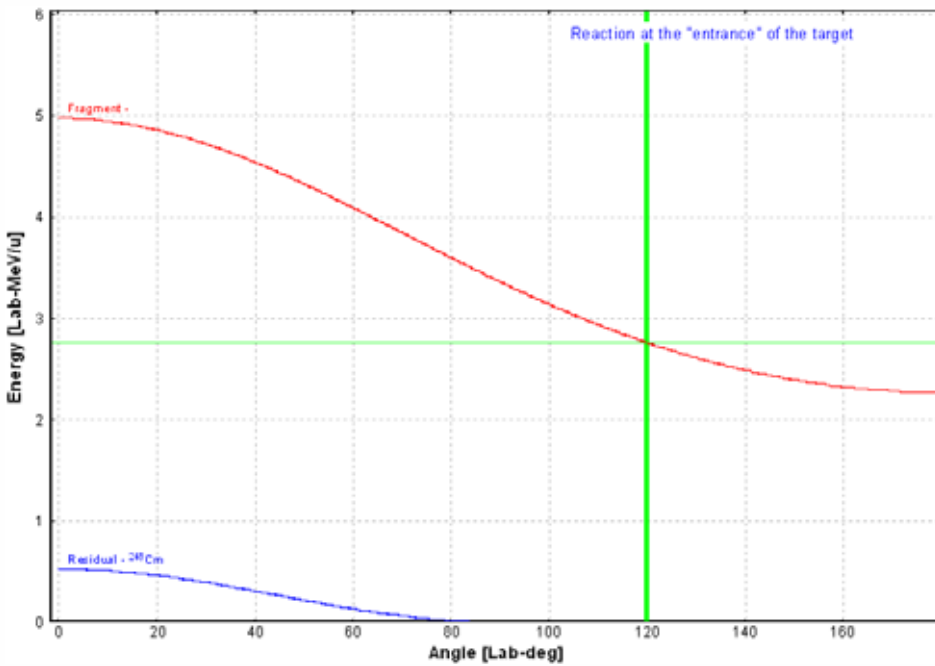
Note: Lab Fragment angle is set to 120 degrees

Reaction's Kinematics: A_{lab} & E_{lab}

$^{48}\text{Ca} + ^{248}\text{Cm} \Rightarrow ^{48}\text{Ca} + ^{248}\text{Cm} \quad ^{248}\text{Cm}(^{48}\text{Ca}, ^{48}\text{Ca})^{248}\text{Cm}$; Reaction at the "entrance" of the target

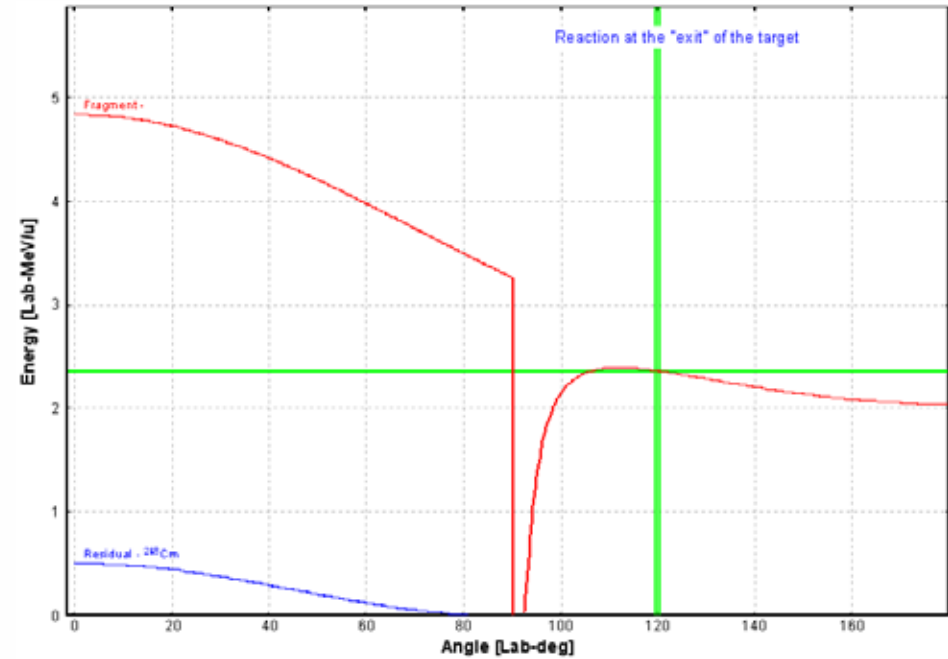
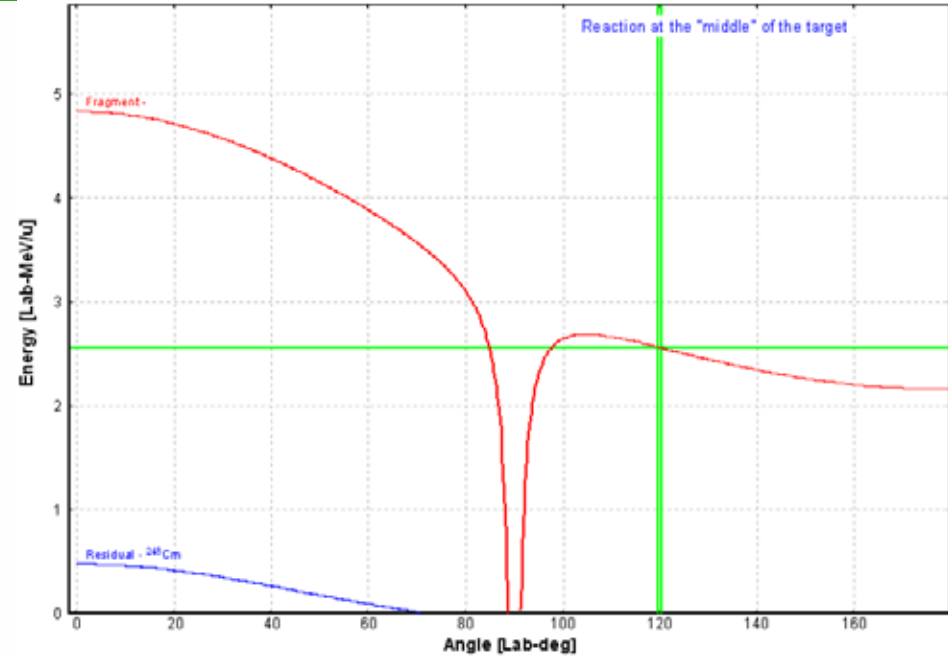
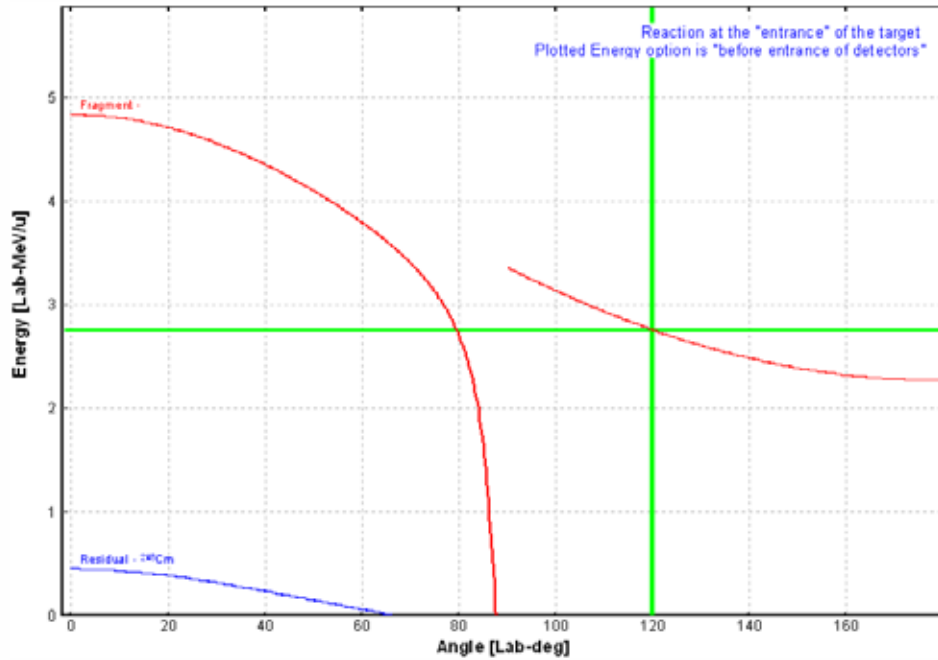
Projectile Energy at the reaction place: 4.97 MeV/u Grazing angle in CMS: $130 \text{ deg} \Rightarrow 137 \text{ deg}$

Q reaction : 0.00 MeV (Excitations 0.0+0.0 \Rightarrow 0.0+0.0); Plotted Energy option is "after reaction"

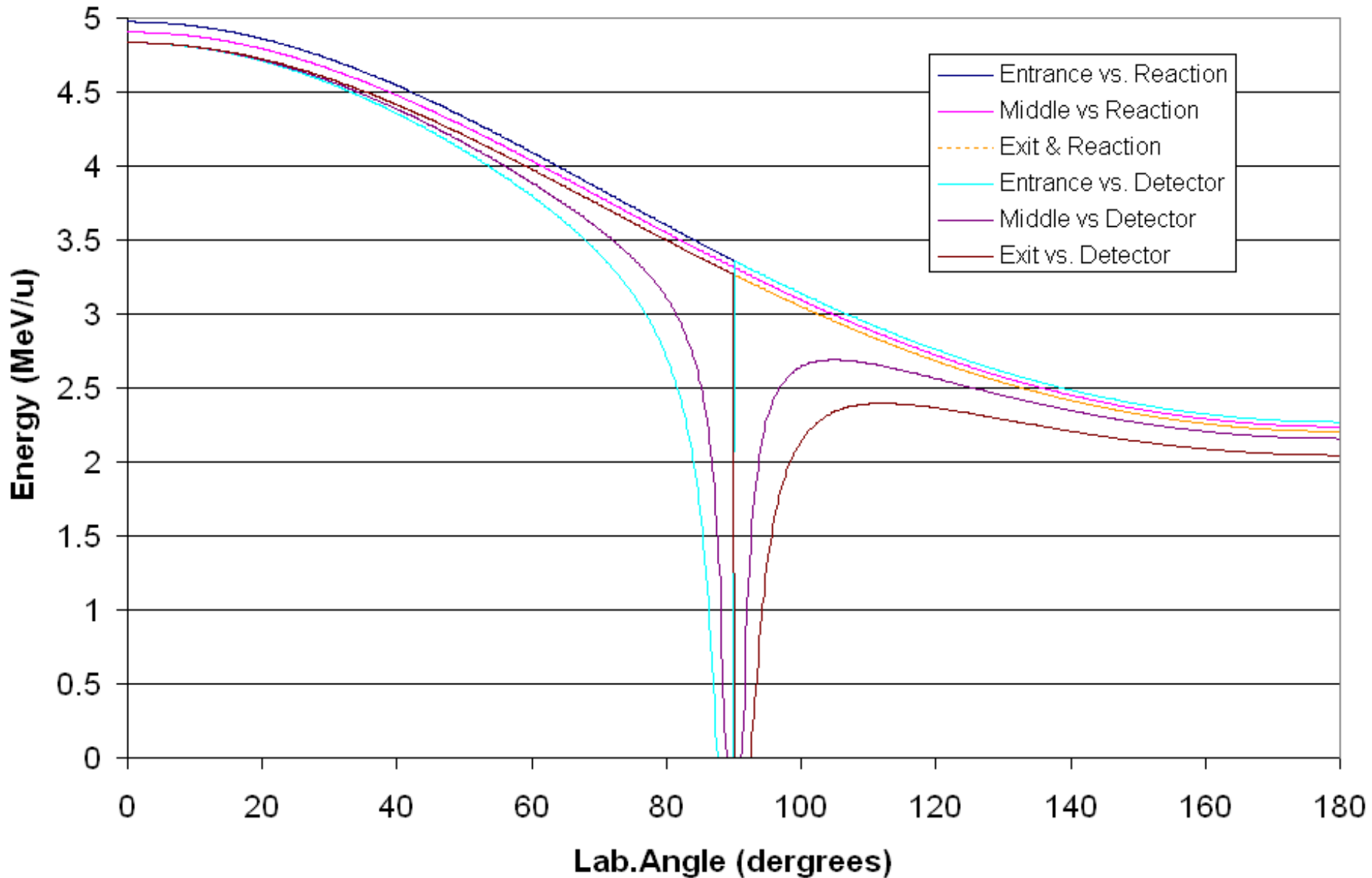


Reaction's Kinematics: A lab & E lab

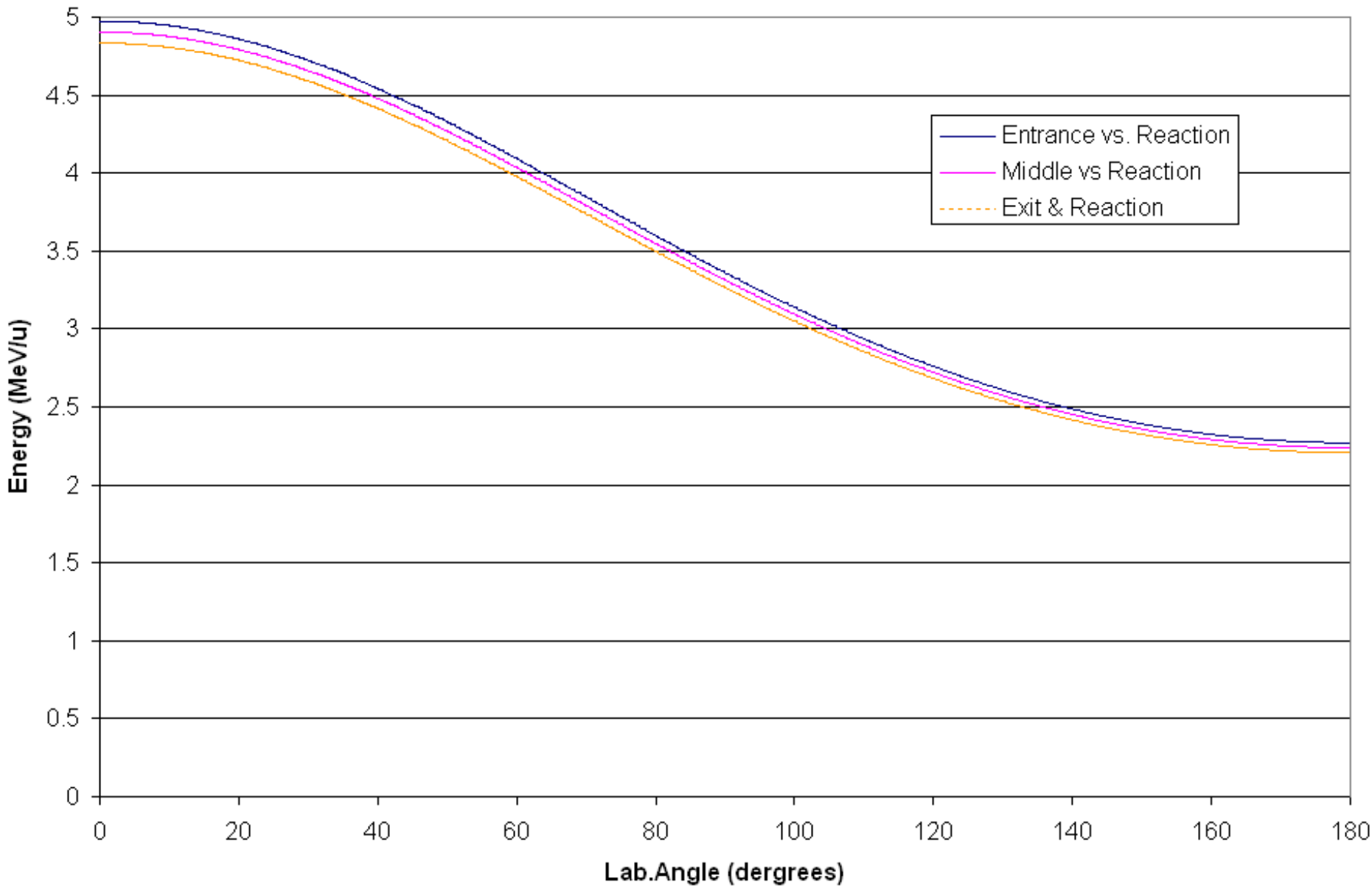
$^{48}\text{Ca} + ^{248}\text{Cm} \Rightarrow ^{48}\text{Ca} + ^{248}\text{Cm}$ $^{248}\text{Cm}(^{48}\text{Ca}, ^{48}\text{Ca})^{248}\text{Cm}$; Reaction at the "middle" of the target
 Projectile Energy at the reaction place: 4.90 MeV/u Grazing angle in CMS [$^{48}\text{Ca} + ^{248}\text{Cm}$] = 180.00 deg
 Q reaction : 0.00 MeV (Excitations 0.0+0.0=>0.0+0.0); Plotted Energy option is "before entrance of detectors"



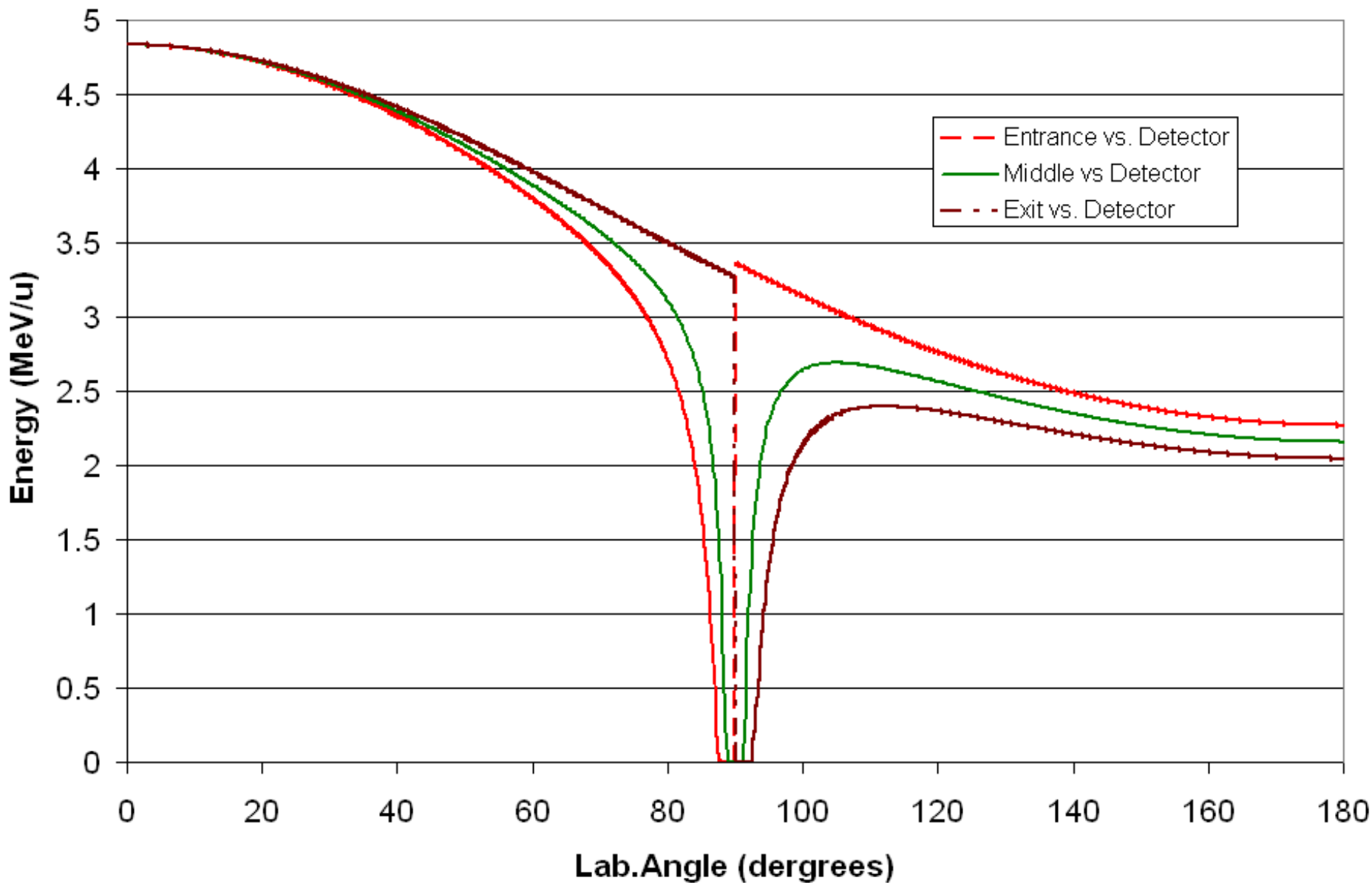
Fragment (48Ca)



Fragment (48Ca)



Fragment (48Ca)



Residues (248Cm)

