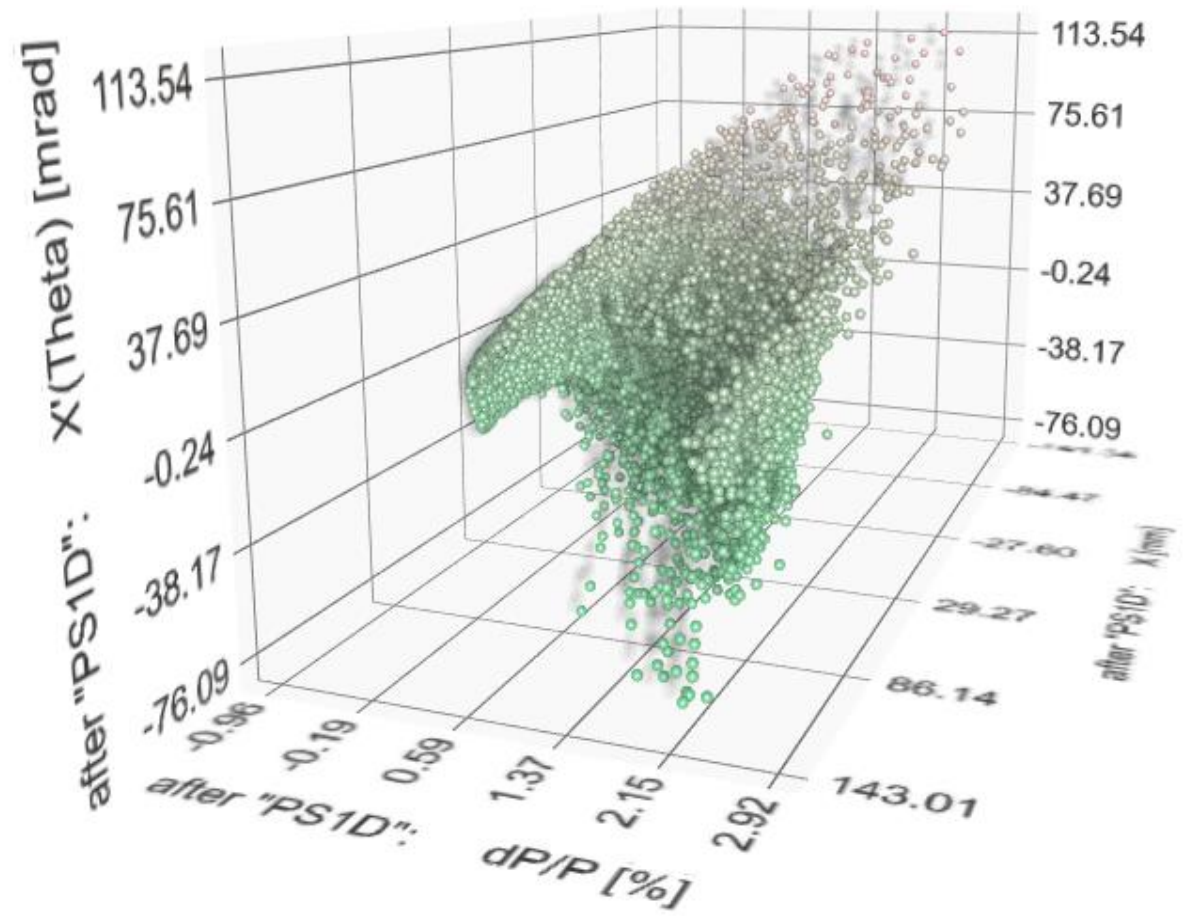


v.15.23
08/31/21

- MC dialog modifications
- 3D-data accumulation in 2D-mode
- 3D-graph features
- Isotope separation in 3D-mode
- Fission products
- 3-D plots future development plans

53Ar : Monte Carlo Transmission Plot



Monte Carlo calculation of fragment transmission

What isotope transmission to calculate?

- One fragment of interest. Chose manually here
- Group of isotopes already calculated by the Distribution method (Ncalc = 0)
- List of isotopes from file to produce inside target
- Input ions rays from file emitted from target

2-D **2-D & 3-D (test version)** ?

A: 53, Element: Ar, Z: 18, β^- decay

Charge states: 18+ PS1A

Reaction mechanism: Projectile Fragmentation

MC transmission options, "Distribution" calculation, Monte Carlo calculation (2D&3D-plots)

X-coordinate After BLOCK: PS1D as Y

- X mm
- X' (T) mrad
- Y mm
- Y' (P) mrad
- dP/P %
- Radial [f(X,Y)] mm
- Angle [f(X,Y)] mrad
- Energy MeV/u
- TKE MeV
- Momentum MeV/c
- Brho T*m
- Erho MJ/C
- Envelope m
- Energy Loss MeV
- Range mm
- Energy Deposition MeV/mm /particle
- Time of flight ns
- Length m
- Stripper: Start
- Wedge 1: Stop
- Velocity: Velocity_Z [cm/ns]
- Ion parameter (M, Z, q...): A (mass number)

Y-coordinate After BLOCK: PS1D as X

- X mm
- X' (T) mrad
- Y mm
- Y' (P) mrad
- dP/P %
- Radial [f(X,Y)] mm
- Angle [f(X,Y)] mrad
- Energy MeV/u
- TKE MeV
- Momentum MeV/c
- Brho T*m
- Erho MJ/C
- Envelope m
- Energy Loss MeV
- Range mm
- Energy Deposition MeV/mm /particle
- Time of flight ns
- Length m
- Stripper: Start
- Wedge 1: Stop
- Velocity: Velocity [cm/ns]
- Ion parameter (M, Z, q...): A/q

Z-coordinate After BLOCK: PS1D as X

- X mm
- X' (T) mrad
- Y mm
- Y' (P) mrad
- dP/P %
- Radial [f(X,Y)] mm
- Angle [f(X,Y)] mrad
- Energy MeV/u
- TKE MeV
- Momentum MeV/c
- Brho T*m
- Erho MJ/C
- Envelope m
- Energy Loss MeV
- Range mm
- Energy Deposition MeV/mm /particle
- Time of flight ns
- Length m
- Stripper: Start
- Wedge 1: Stop
- Velocity: Velocity [cm/ns]
- Ion parameter (M, Z, q...): A-2q

Gate 1: no gate

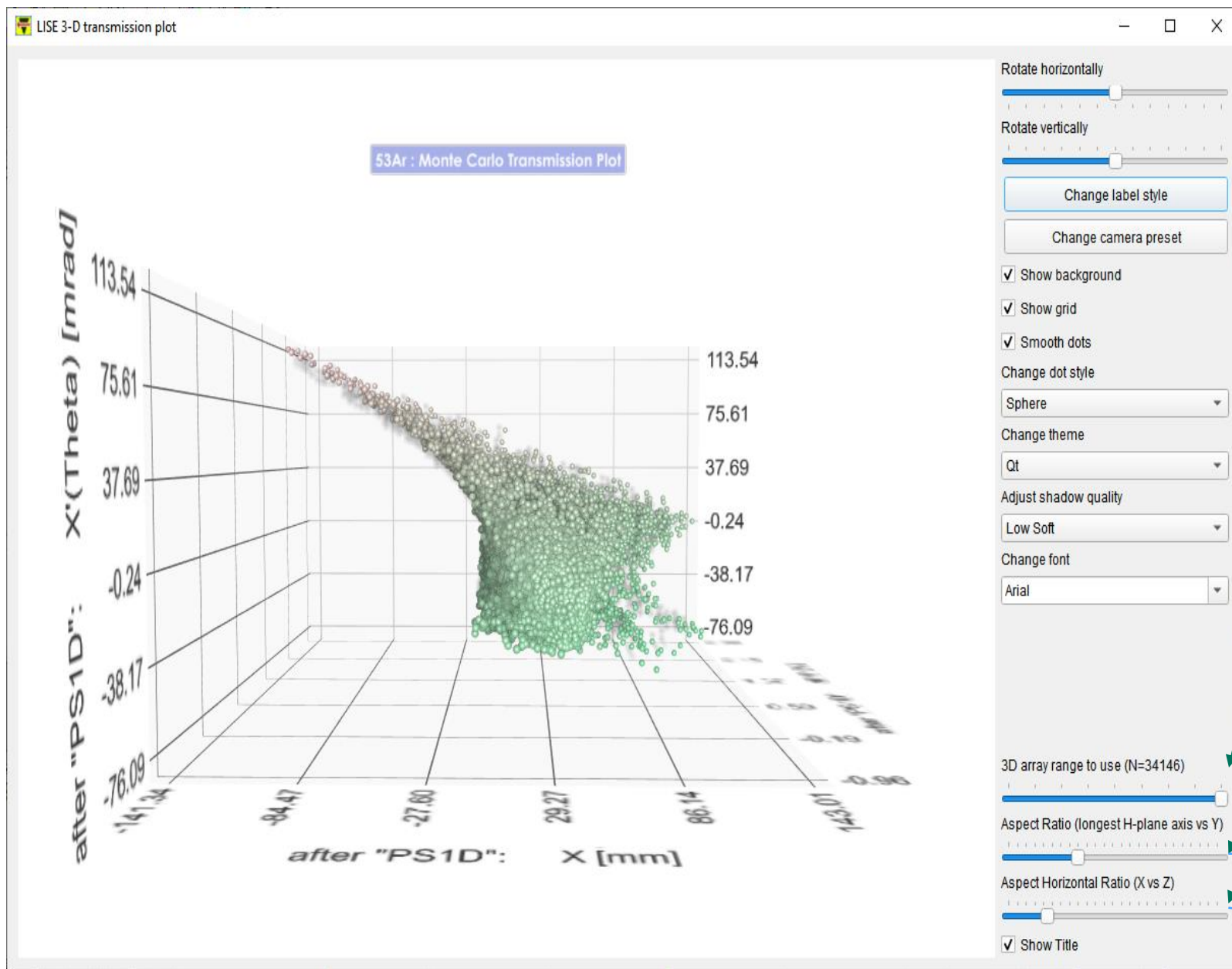
Gate 2: no gate

Gate 3: no gate

Gate 4: no gate

Switch to 2D&3D mode

No Envelope and Deposition plots in 3D-mode



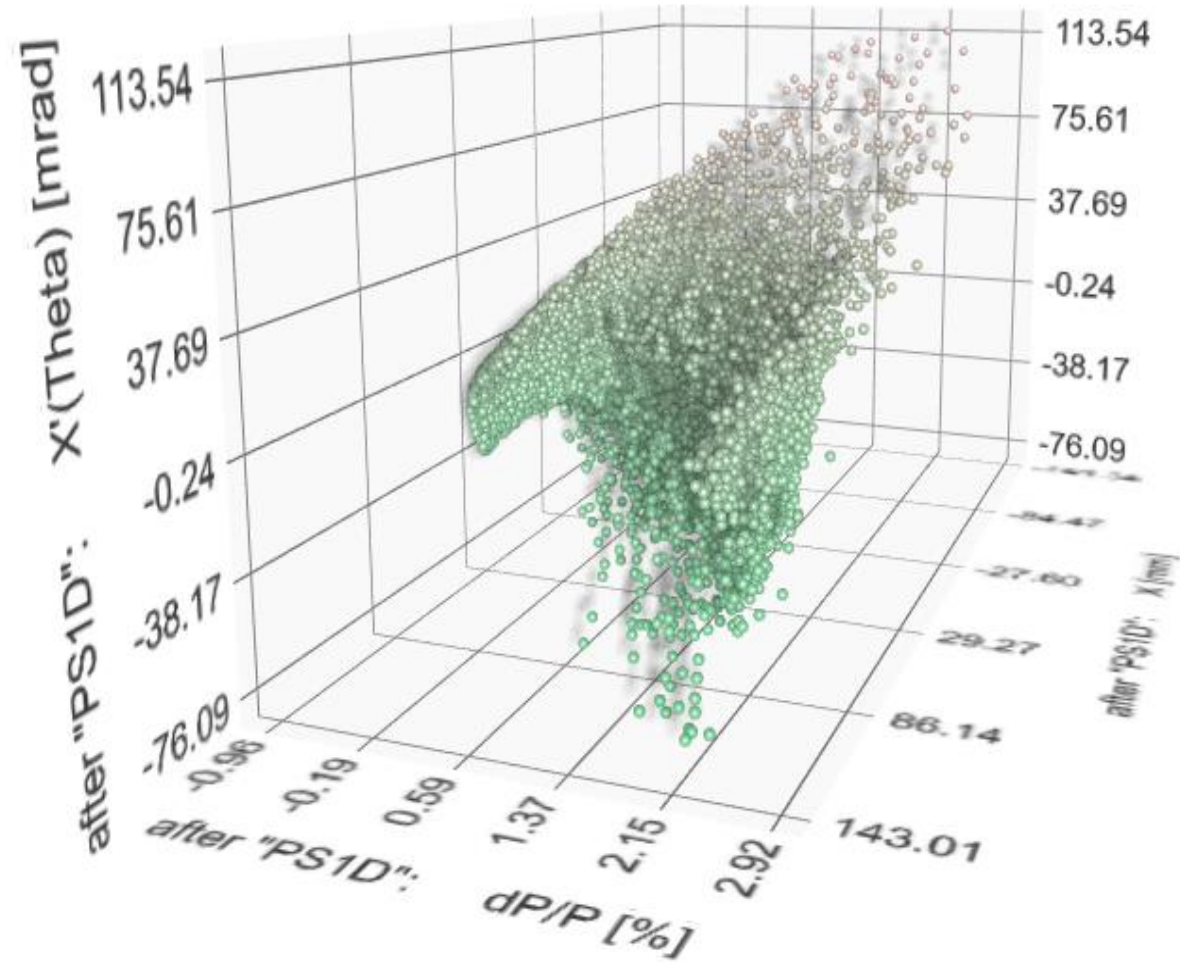
Initially set to a maximum size of the array accumulated during 2D plotting

Initially set to 1 & 1

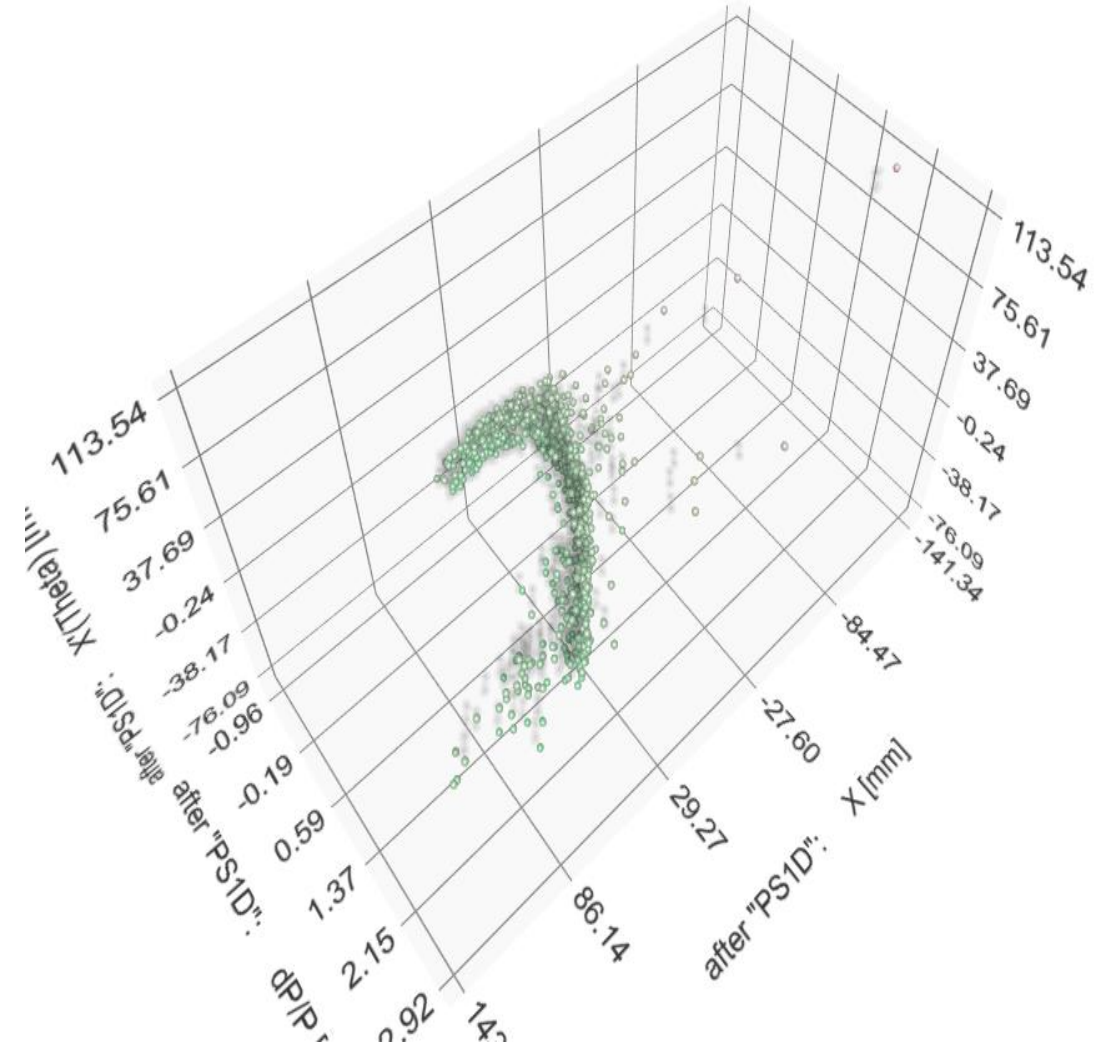
This property holds the ratio of the graph scaling between the longest axis on the horizontal plane and the y-axis

This property holds the ratio of the graph scaling between the x-axis and z-axis

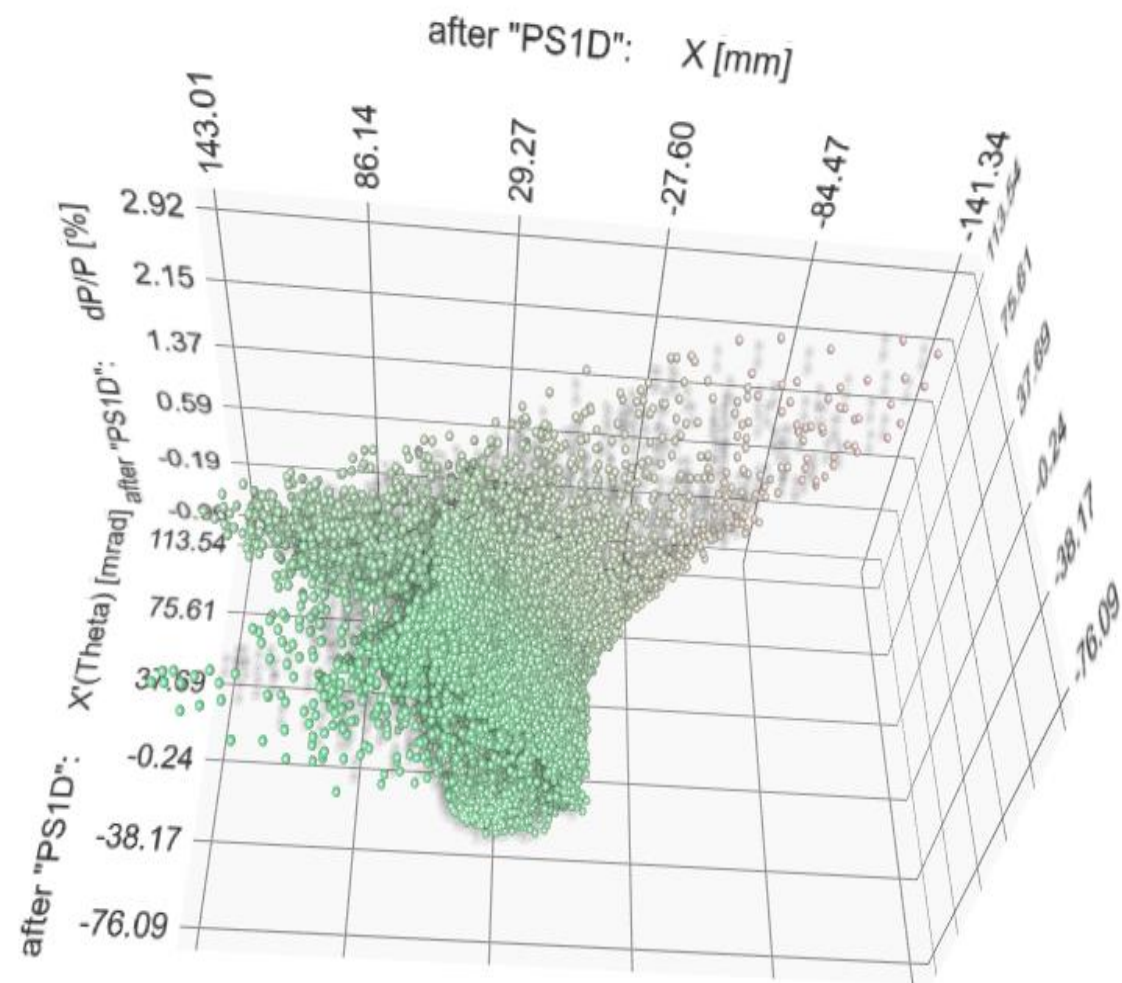
full statistics



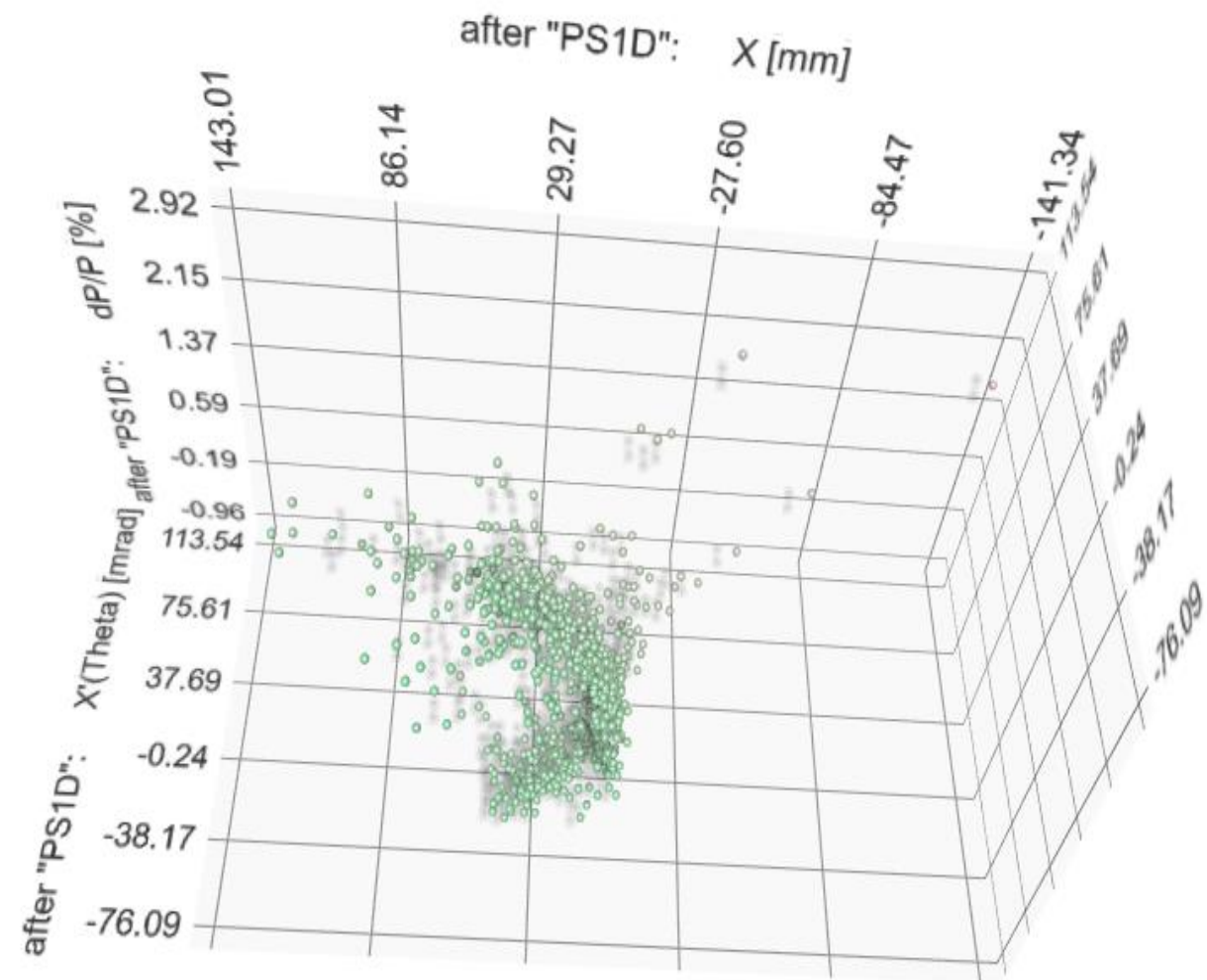
Small part of statistics



full statistics



Small part of statistics



No isotope separation in this plane

Projectile 82 Se 34+
250 MeV/u 10 kW

Fragment 53 Ar 18+

Target 12 C 9 mm

Stripper

PS_wdg Al 1.75 mm

PS1C Bp=5.7278 Tm

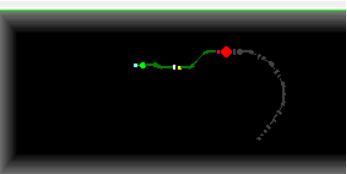
PS1D Bp=5.7278 Tm

Material 1 Si 1 mm

FaradayCup 1

PS_FP_slit slits

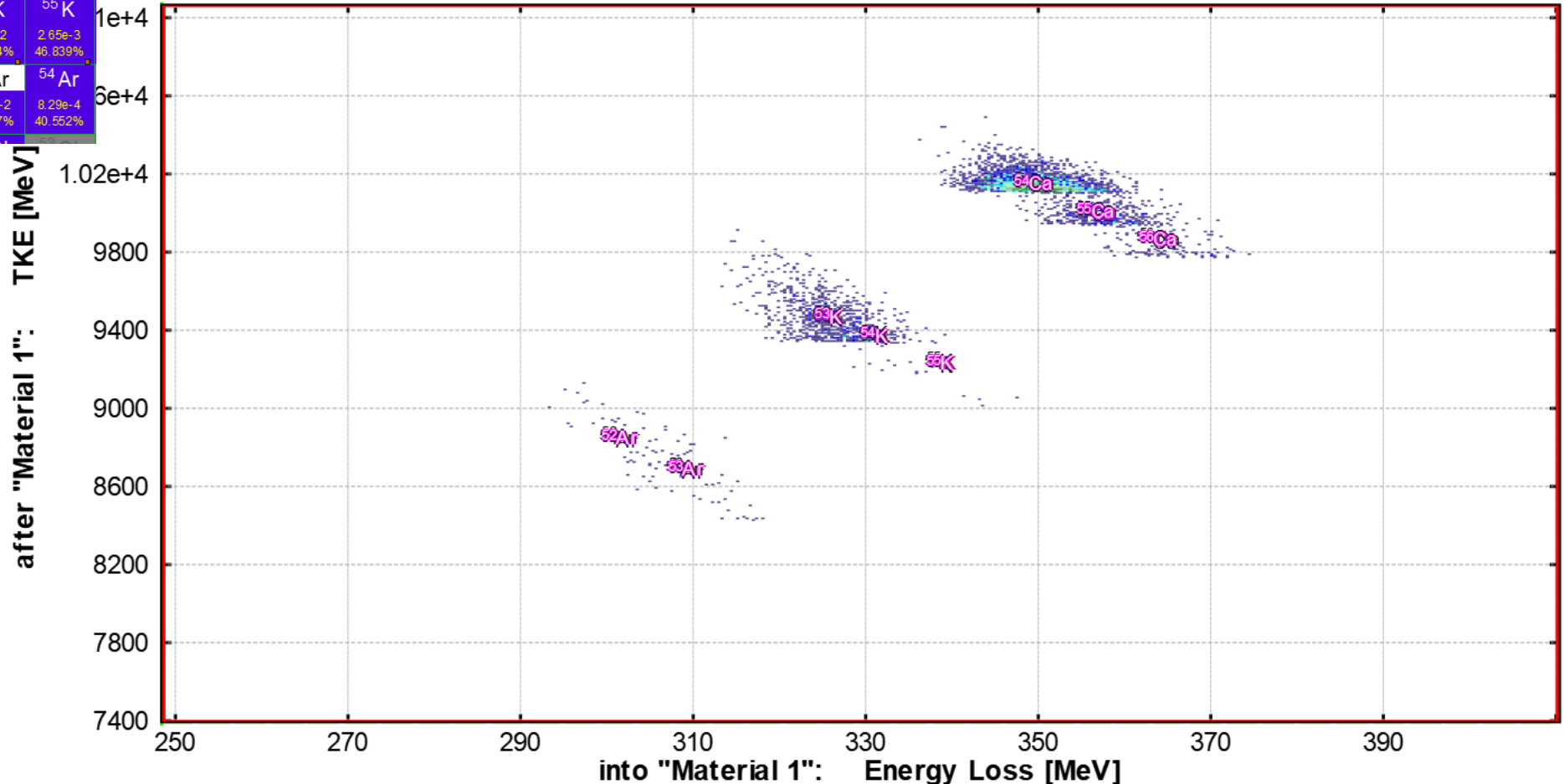
RA-90 Angle=-90 deg



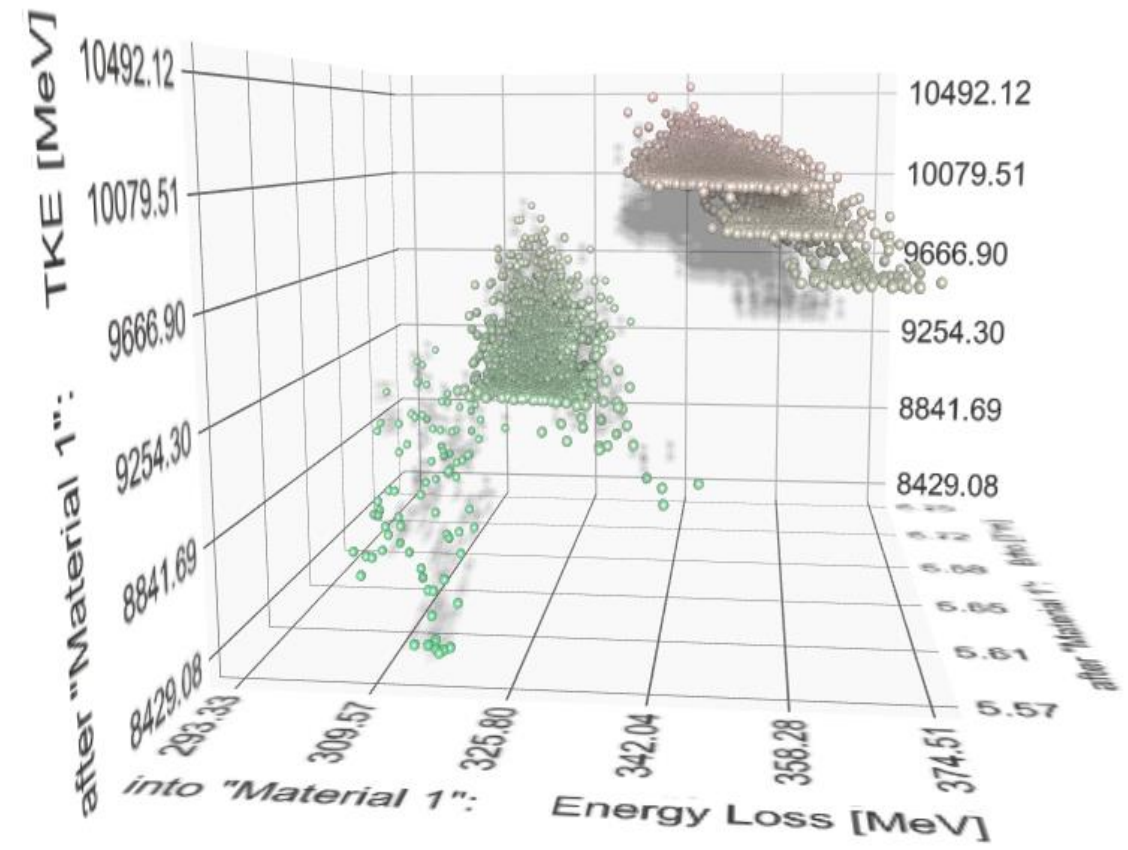
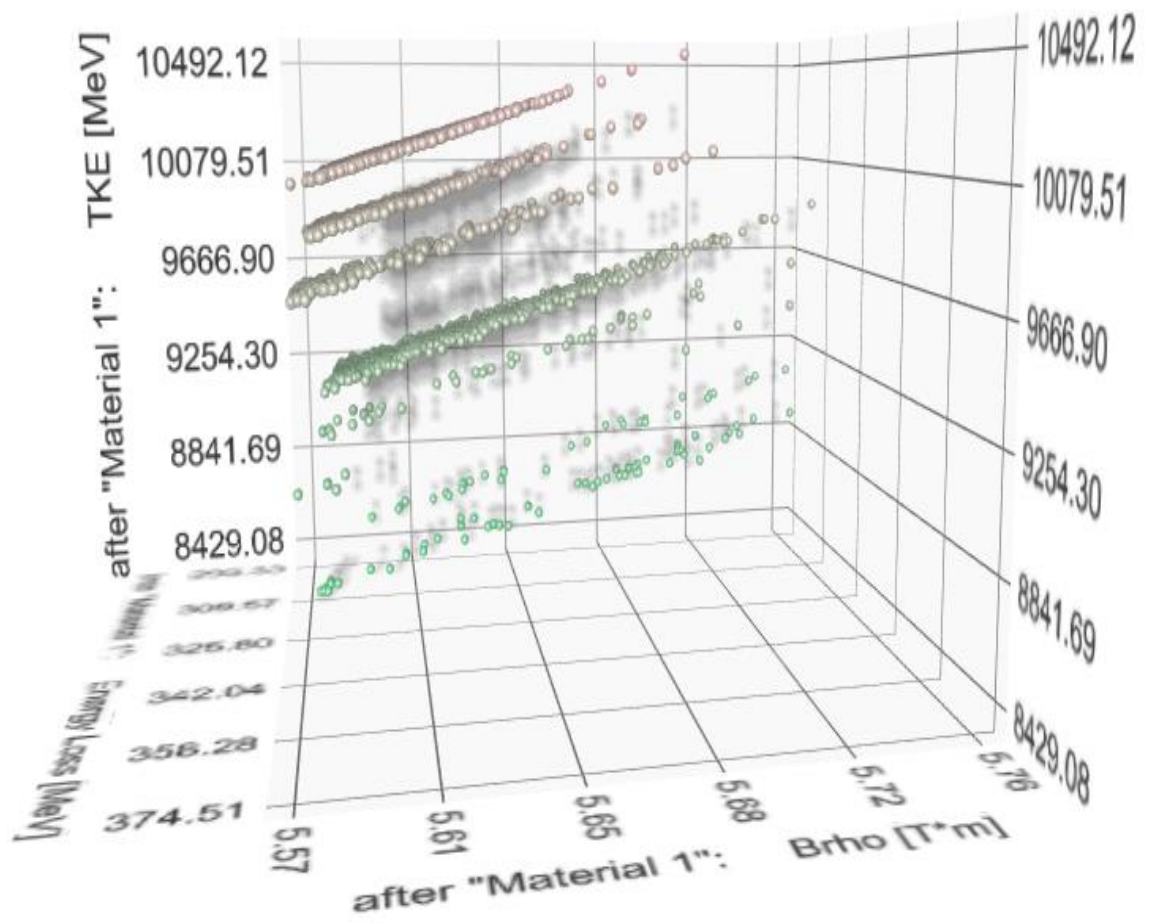
53 Ca	54 Ca	55 Ca	56 Ca
1.16e+0	1.49e-1	5.35e-2	
9.185%	22.287%	33.139%	
52 K	53 K	54 K	55 K
2.45e-1	1.4e-2	2.65e-3	
32.633%	42.194%	46.839%	
51 Ar	52 Ar	53 Ar	54 Ar
8.11e-3	1.49e-2	8.29e-4	
43.315%	42.287%	40.552%	

Isotope Group : Monte Carlo Yield Plot

82 Se (250 MeV/u) + C (9 mm); Transmitted Fragment 53 Ar (ProjFrag); Optics Order: 3
 dp/p=9.34%; Wedges: Al (1.75 mm); Brho(Tm): 5.9336, 5.9336, 5.7278, 5.7278
 AngAccept: ON; Bounds: Off; "Material 1" - last block for MC calc; no gates; Config: 4oDDI,DD,m



Includes resolution of energy loss and timing detectors



Good isotope separation in this plane

Projectile 82 Se³⁴⁺
250 MeV/u 10 kW

Fragment 53 Ar¹⁸⁺

Target 12 C 9 mm

Stripper

PS1C Bp=5.7278 Tm

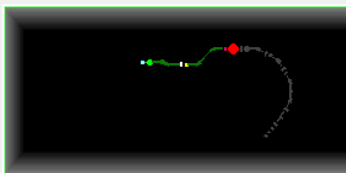
PS1D Bp=5.7278 Tm

Material 1 Si 1 mm

FaradayCup 1

PS_FP_slit slits

RA-90 Angle=-90 deg



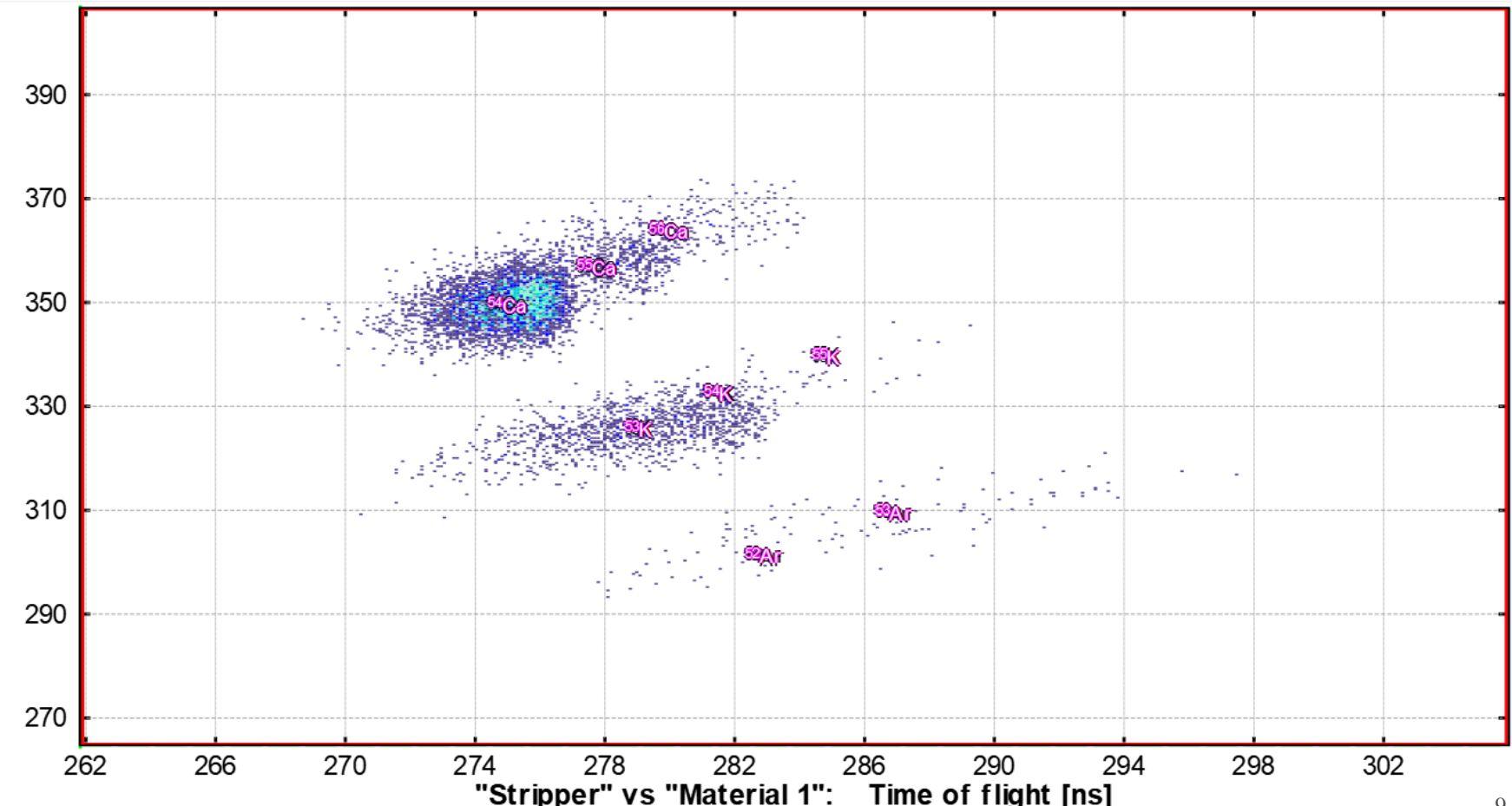
53 Ca	54 Ca	55 Ca	56 Ca
1.16e+0	1.49e-1	5.35e-2	
9.185%	22.287%	33.139%	
52 K	53 K	54 K	55 K
2.45e-1	1.4e-2	2.65e-3	
32.633%	42.194%	46.839%	
51 Ar	52 Ar	53 Ar	54 Ar
8.11e-3	1.49e-2	8.29e-4	
43.315%	42.287%	40.552%	

No isotope separation in this plane

Isotope Group : Monte Carlo Yield Plot

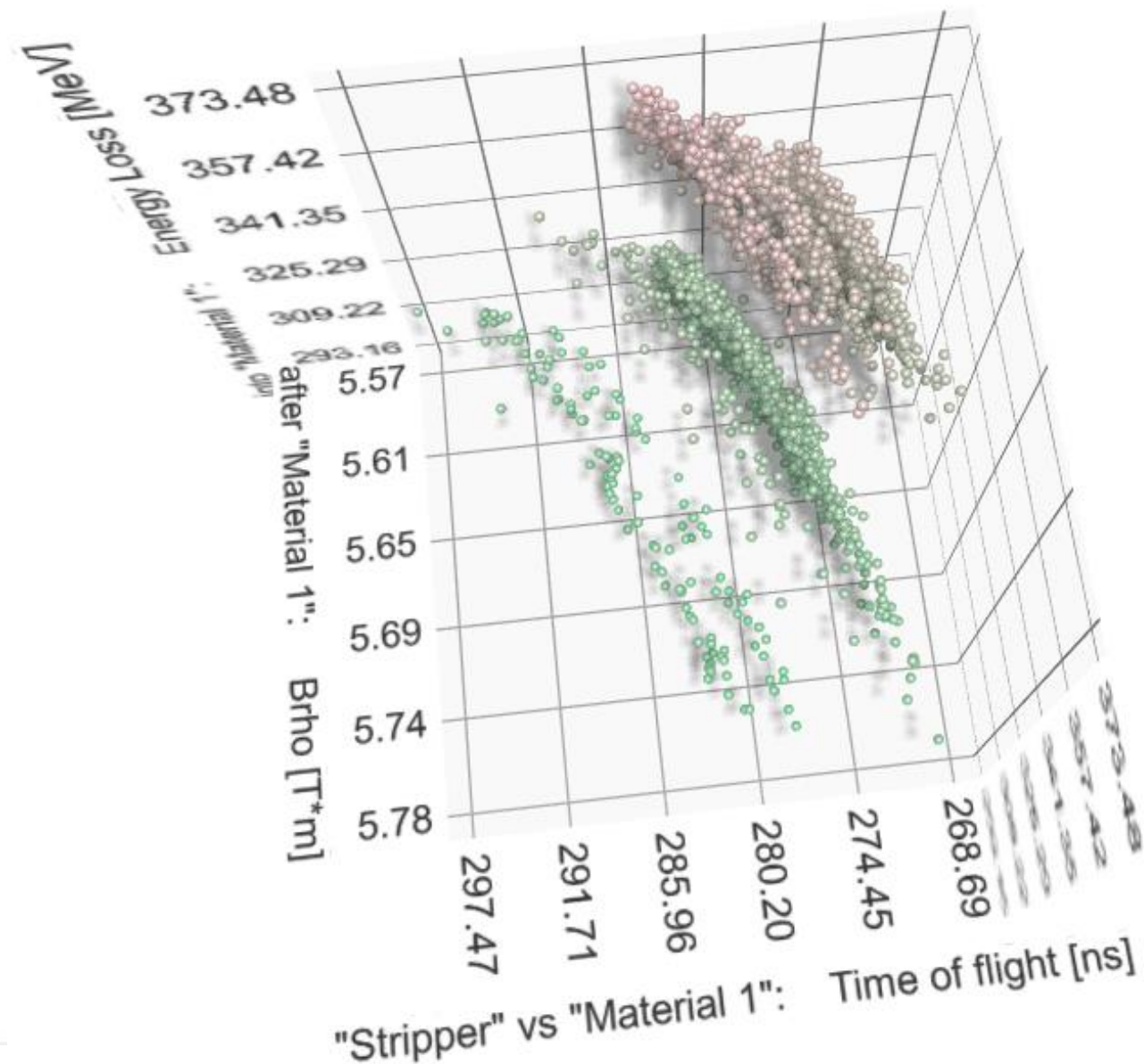
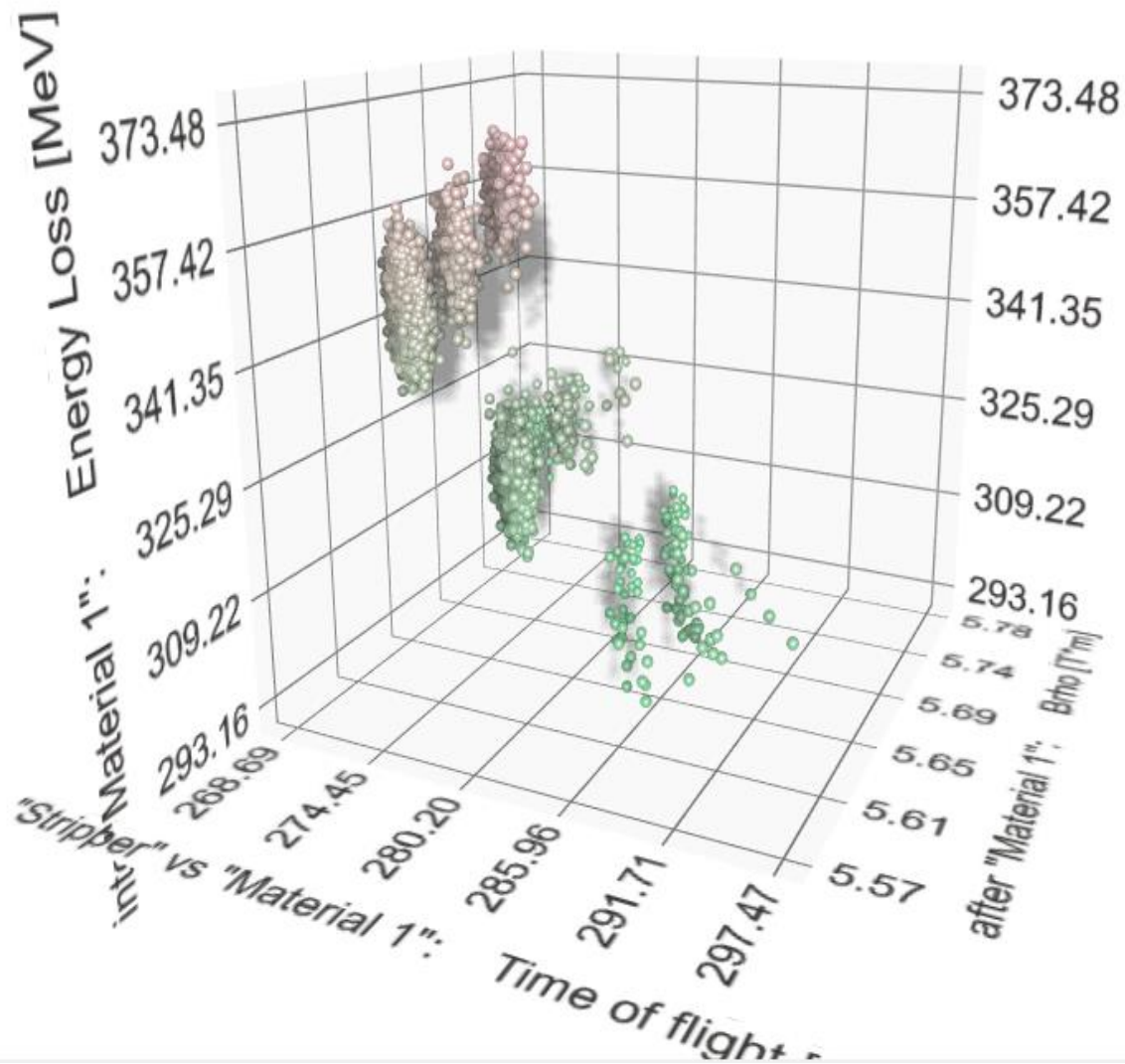
⁸²Se (250 MeV/u) + C (9 mm); Transmitted Fragment ⁵³Ar (ProjFrag); Optics Order: 3
 dp/p=9.34%; Wedges: Al (1.75 mm); Brho(Tm): 5.9336, 5.9336, 5.7278, 5.7278
 AngAccept: ON; Bounds: Off; "Material 1" - last block for MC calc; no gates; Config: %DDI,DD_m

into "Material 1": Energy Loss [M]



Includes resolution of energy loss and timing detectors

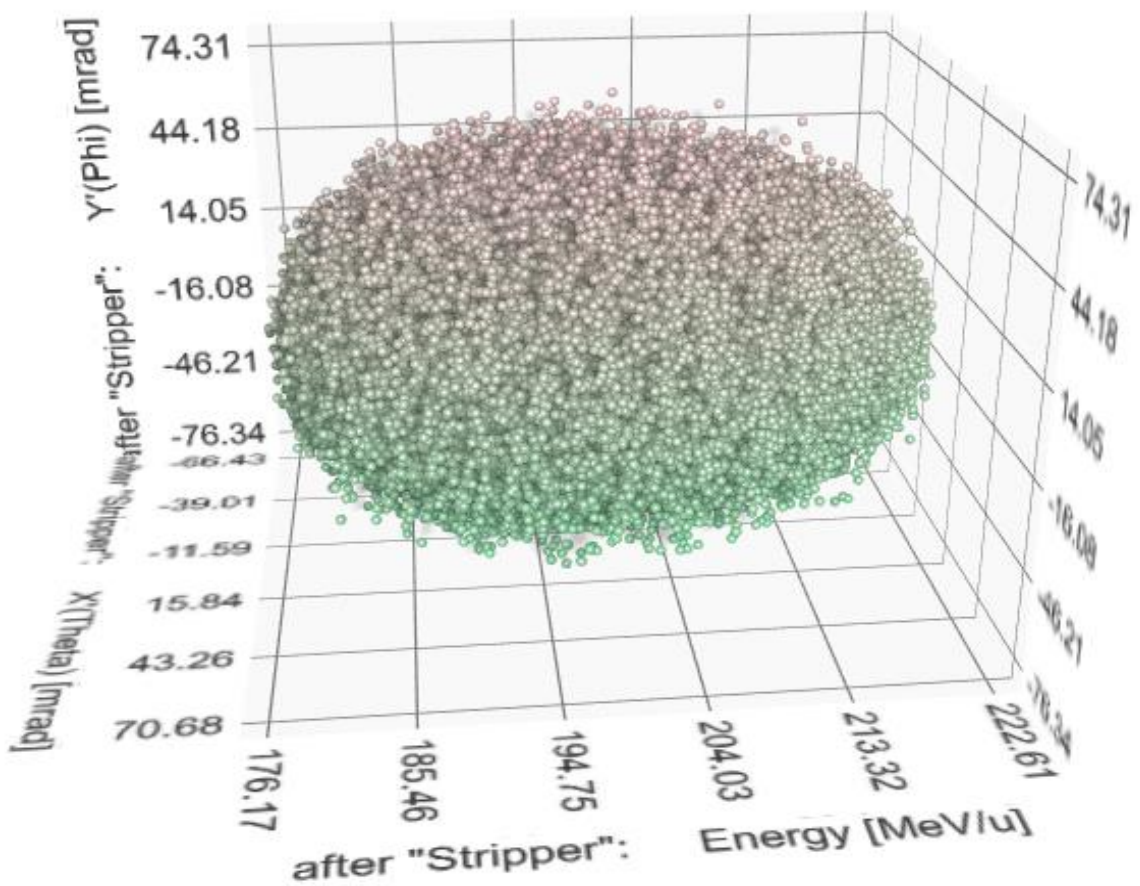
Good isotope separation in this plane



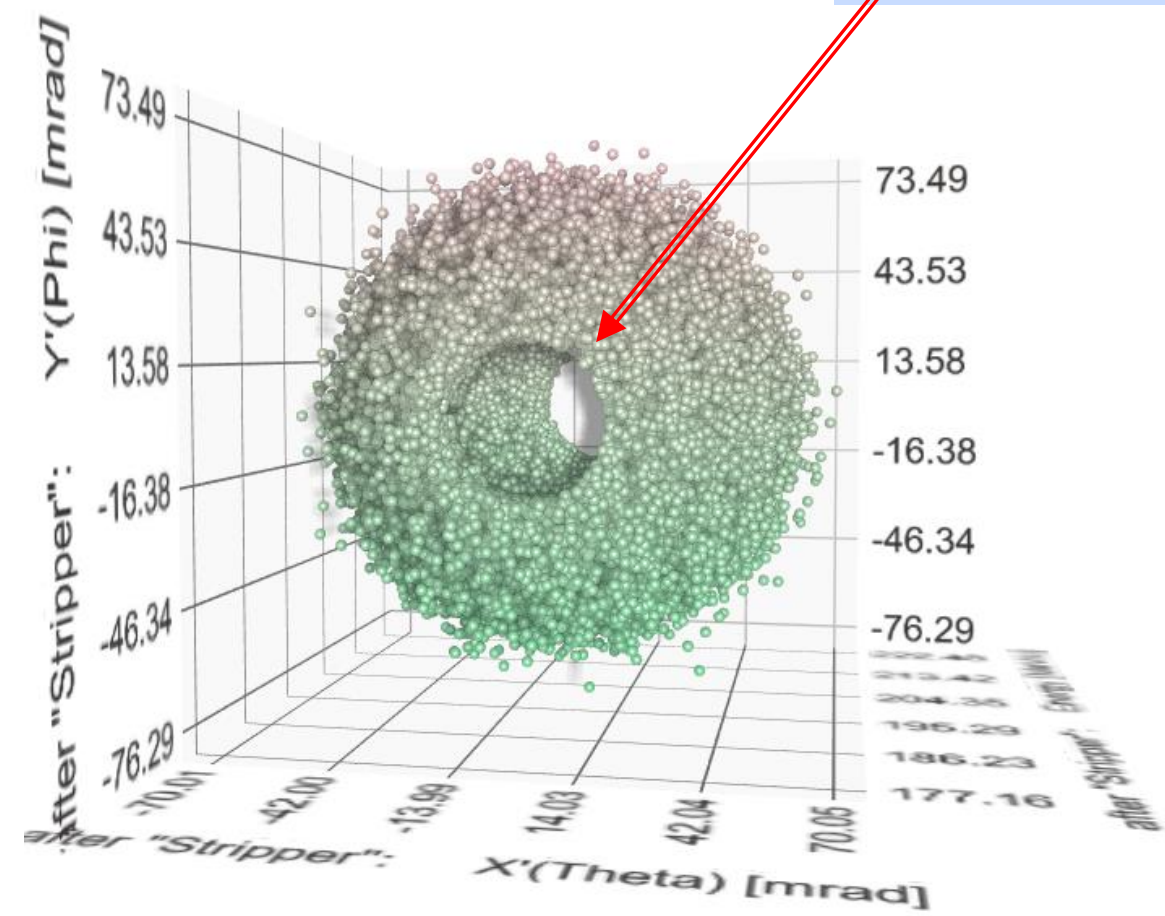
Fission products in 3-D

Projectile 238 U 92+
 200 MeV/u 1 pA
Fragment 132 Sn 50+.. 50+
 EERs: 237 U(34) 232 Th(108) 222 Rn(394)
Target 12 C 0.01 g/cm²

132Sn : Monte Carlo Transmission Plot



132Sn : Monte Carlo Transmission Plot



Gate 1

Settings

"NOT" [0, 20]

< Angle [mrad] > after Stripper

- Statistics Binning to use intensity color
- Multi-isotope mode: specific color for each isotope + labels
- 3D Envelope mode development
- Use absolute coordinates in the envelope mode (for example using dipole angles)
- Use 3D semi-transparent objects to show separator elements