

- “Degrader profile” block
- “Material block”
- “Directory” → file names, sorting
- Preliminary porting schedule

Total Connection of "material" dialogs ~ 50%

## Target

Be

Density: 1.85 g/cm<sup>3</sup>

calculate reactions in this material

Z	Element	Mass
<input checked="" type="checkbox"/> 4	Be	9.012
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		

State of Matter:  Solid,  Gas

Dimension:  mg/cm<sup>2</sup> & micron,  g/cm<sup>2</sup> & mm

Angle: Calculate, 0 degrees

Thickness at 0 degrees: 972.97297 micron, 180 mg/cm<sup>2</sup>

Effective Thickness: 972.97297 micron, 180 mg/cm<sup>2</sup>

Atoms / cm<sup>2</sup>: 1.20e+022, Energy Loss in the target box [kW]: 0.000746

d/Range (beam): 0.219

Buttons: OK, Cancel, Thickness defect, Set the spectrometer after this block using changes

Block property:

No General block settings  
No Calibration

## Material

H9C9O

Density: 1.45 g/cm<sup>3</sup>

calculate reactions in this material

Z	Element	Mass	Stoich
<input checked="" type="checkbox"/> 1	H	1.008	9
<input checked="" type="checkbox"/> 6	C	12.011	9
<input checked="" type="checkbox"/> 8	O	15.999	1
<input type="checkbox"/> 14			
<input type="checkbox"/> 14			

State of Matter:  Solid,  Gas

Dimension:  mg/cm<sup>2</sup> & micron,  g/cm<sup>2</sup> & mm

Angle: Calculate, 0 degrees

Thickness at 0 degrees: 100 micron, 14.5 mg/cm<sup>2</sup>

Effective Thickness: 100 micron, 14.5 mg/cm<sup>2</sup>

Atoms / cm<sup>2</sup>: 1.25e+021

Buttons: OK, Cancel, General block settings, Calibration, Resolution, Thickness defect, Set the spectrometer after this block using changes

Block property:

No d/range  
No Energy loss  
No Absorbed dose

## Wedge

Al

Density: 2.7 g/cm<sup>3</sup>

calculate reactions in this material

Z	Element	Mass
<input checked="" type="checkbox"/> 13	Al	26.982
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		
<input type="checkbox"/> 14		

State of Matter:  Solid,  Gas

Dimension:  mg/cm<sup>2</sup> & micron,  g/cm<sup>2</sup> & mm

Thickness at 0 degrees: 125.1 micron, 33.777 mg/cm<sup>2</sup>

Effective Thickness: 125.1 micron, 33.777 mg/cm<sup>2</sup>

Atoms / cm<sup>2</sup>: 7.54e+020, d/Range (frag): 0.219

Buttons: OK, Cancel, General block settings, Thickness defect, Set the spectrometer after this block using changes

Optical Matrix: Matrix element (6,6) or d/d: 1.0

Position - thickness: -40 coordinate, mm, +40; 98 thickness, mg/cm<sup>2</sup>, 102

Degrader profile:  Wedge profile, Angle (mrad): 0.123, Calculate angle;  Homogeneous;  Curved profile, Curved profile dialog;  Custom shape, Custom shape dialog

1. Setting fragment stops in wedge

Block property:

No Angle  
No Energy loss  
No Calibration  
No Absorbed dose

## Material

H9C9O

calculate reactions in this material

Z	Element	Mass	Stoich
<input checked="" type="checkbox"/>	1 H	1.008	9
<input checked="" type="checkbox"/>	6 C	12.011	9
<input checked="" type="checkbox"/>	8 O	15.999	1
<input type="checkbox"/>	14		
<input type="checkbox"/>	14		

Compound dictionary

OK Cancel

## Gas density

Not working yet

Input Average Molar Mass in the case of gas mixture. For example M=28.97 for air, or M=37.6 for P-10 gas

Molar mass = 29.0

Parameter	Value	Dimension
Temperature (K)	293.15	K
Pressure (Torr)	759	760 Torr
Density	123	760den mg/cm3 kg/m3 g/L

Units converter Fix Cancel

## Calculation of Angle

Done!

Thickness at 0 degrees 100 micron

Thickness Effective 350

Angle 73.40 degrees

OK Cancel

## General Block Settings

Not working yet

Type of Block 10.22

Let call automatically

Block Name Dipole 1

Block Length 120.2 m

Distance from the target to in the beginning 10.22 m at the end 10.22 m

OK Cancel

## Calibration

Not working yet

Parameter	Calibration	Resolution (sigma)	Dimension
Energy Loss	<input checked="" type="checkbox"/> dE	0.5	% MeV
Time of flight	<input checked="" type="checkbox"/> TOF	0.1	ns
Horizontal space	<input checked="" type="checkbox"/> X	0.3	mm
Vertical space	<input checked="" type="checkbox"/> Y	0.3	mm

Thickness defect 0.1 % 0 micron

OK Cancel

## Compounds

Done!

	Common Name	Atomic Stoich.	Density	
Nuclear physics materials	Aluminum Oxide alpha	Al2 O3	3.98	Input
Plastic-polymers	Bakelite	H9 C9 O1	1.45	Input
Liquids	1-2 - Ethanedio1	H6 C2 O2	1.1088	Input
Gases	Acetylene	H2 C2	0.0010825	Input

Cancel

## Periodic Tables of Elements

Done!

PERIODIC TABLE OF ELEMENTS

BMP Cancel

# "Degradar profile" : new BASE class dialog

**Thickness of Wedge**

Material: Al

Density: 2.7 g/cm<sup>3</sup>

State of Matter: Solid

Dimension: mg/cm<sup>2</sup> & micron

Thickness at 0 degrees: 125.1 micron

Effective Thickness: 125.1 micron

Atoms / cm<sup>2</sup>: 7.54e+20

d/Range (frag): 0.219

Optical Matrix: Matrix element (6,6) or d/d: 1.0

Buttons: Calculate angle, Curved profile dialog, Custom shape dialog

1. Setting fragment stops in wedge

**Curved Profile degrader focal plane**

Dispersion Plane: X (horizontal) / Y (vertical)

Mode: Wedge

Block: Wedge

Degrader Profile: Homogeneous

Setting fragment: 42S16+

For the central trajectory: Thickness: Al (125.1 micron)

Energy before the degrader: 33.33 MeV/u

Energy after the degrader: 33.33 MeV/u

Dimension of wedge angle distributions (default 16): 16

Diagram: Shows a beam passing through a curved wedge with parameters  $x_0$ ,  $-dx$ ,  $+dx$ ,  $L$ ,  $e_0$ ,  $e_x$ ,  $h$ , and  $\theta$ .

Custom Shape Degrader: Choose mode, X0: 2.888 mm, L: 3.51 mm, h: 4.21 mm, e0: 4.21 micron

Buttons: Calculate, Plot, Make it as Current

base

**Wedge degrader in dispersive focal plane**

Dispersion Plane: X (horizontal) / Y (vertical)

Mode: Wedge

Block: Wedge

Degrader Profile: Homogeneous

Setting fragment: 42S16+

For the central trajectory: Thickness: Al (125.1 micron)

Energy before the degrader: 33.33 MeV/u

Energy after the degrader: 33.33 MeV/u

Dimension of wedge angle distributions (default 16): 16

Diagram: Shows a beam passing through a wedge with parameters  $x_0$ ,  $-dx$ ,  $+dx$ ,  $L$ ,  $e_0$ , and  $\theta$ .

Custom Shape Degrader: Choose mode, X0: 2.888 mm, L: 3.51 mm, h: 4.21 mm, e0: 4.21 micron

Buttons: Calculate, Plot, Make it as Current

**Custom Shape degrader in dispersive focal plane**

Dispersion Plane: X (horizontal) / Y (vertical)

Mode: Wedge

Block: Wedge

Degrader Profile: Homogeneous

Setting fragment: 42S16+

For the central trajectory: Thickness: Al (125.1 micron)

Energy before the degrader: 33.33 MeV/u

Energy after the degrader: 33.33 MeV/u

Dimension of wedge angle distributions (default 16): 16

Diagram: Shows a beam passing through a custom shaped wedge with parameters  $x_0$ ,  $-dx$ ,  $+dx$ ,  $L$ ,  $e_0$ , and  $\theta$ .

Polynomial mode: Coefficients: a0=1, a1=2, a2=3, a3=4, a4=5

Polynomial fit of the CURRENT custom shape: x-left: -30, x-right: 40

Custom Shape Degrader: Choose mode, X0: 2.888 mm, L: 3.51 mm, h: 4.21 mm, e0: 4.21 micron

Buttons: Calculate, Plot, Make it as Current

- Folder [c\_Config]
- Folder [c\_PlotGraph]
- Folder [d\_BlockOptic]
- Folder [d\_Calculator]
- Folder [d\_CN]
- Folder [d\_Database]
- Folder [d\_MC]
- Folder [d\_Mechanism]
- Folder [d\_Options]
- Folder [d\_Plot]
- Folder [d\_Plot\_CSdialogs]
- Folder [d\_Setup]
- Folder [d\_Thick]
- Folder [d\_Uilities]
- Folder [Icons]
- Folder [L\_atima]
- Folder [L\_Block]
- Folder [L\_calise]
- Folder [L\_dbf]
- Folder [L\_distribution]
- Folder [L\_element]
- Folder [L\_init]
- Folder [L\_loss]
- Folder [L\_mass]
- Folder [L\_taulise]
- Folder [l\_utils]
- Folder [o\_evap]
- Folder [o\_fission]
- Folder [o\_phys]
- Folder [q\_dbf]
- Folder [q\_style]
- Folder [tt]
- Folder [w\_Bi]
- Folder [w\_Graph]
- Folder [w\_IsoTable]
- Folder [w\_Main]
- Folder [w\_Staff]

c:\LISEcute\d\_Calculator\\*

Name	Ext
[.]	
[d_Kinematics]	
d_Calculator_errorMean	cpp
d_Calculator_errorMean	h
d_Calculator_errorMean	ui
d_Calculator_fusionResidue	cpp
d_Calculator_fusionResidue	h
d_Calculator_fusionResidue	ui
d_Calculator_ionisation	cpp
d_Calculator_ionisation	h
d_Calculator_ionisation	ui
d_Calculator_math	cpp
d_Calculator_math	h
d_Calculator_math	ui
d_Calculator_matrix	cpp
d_Calculator_matrix	h
d_Calculator_matrix	ui
d_Calculator_phys	cpp
d_Calculator_phys	h
d_Calculator_phys	ui
d_Calculator_radiation	cpp
d_Calculator_radiation	h
d_Calculator_radiation	ui
d_Calculator_radiationOptions	cpp
d_Calculator_radiationOptions	h
d_Calculator_radiationOptions	ui

c:\LISEcute\d\_BlockOptic\\*

Name	Ext
[.]	
[BlockBase]	
[Matrix]	
d_Acc	cpp
d_Acc_limit	cpp
d_Angle_DM	cpp
d_Beam_optimum	cpp
d_Block_calibration	cpp
d_Block_option	cpp
d_Buncher	cpp
d_D6	cpp
d_Delay	cpp
d_Delay_file	cpp
d_Dipole_electric	cpp
d_Dipole_magnetic	cpp
d_Dipole_transport	cpp
d_Drift	cpp
d_Finger	cpp
d_Fit	cpp
d_GNS	cpp
d_Kicker	cpp
d_Kicker_fit	cpp
d_Magnet_ideal	cpp
d_Multipole	cpp
d_Quad	cpp
d_Quad_calibration	cpp
d_Quad_effLength	cpp
d_Quad_electric	cpp
d_Rotate	cpp
d_Shift	cpp
d_Solenoid_block	cpp
d_Wien	cpp
o_Acc_solidAngle	cpp
o_Magnet_ideal	cpp
d_Acc	h
d_Acc_limit	h
d_Angle_DM	h
d_Beam_optimum	h
d_Block_calibration	h
d_Block_option	h
d_Buncher	h
d_D6	h
d_Delay	h
d_Delay_file	h
d_Dipole_electric	h

New LISE++ file convention

w\_Bbbb\_wwwAaaa

