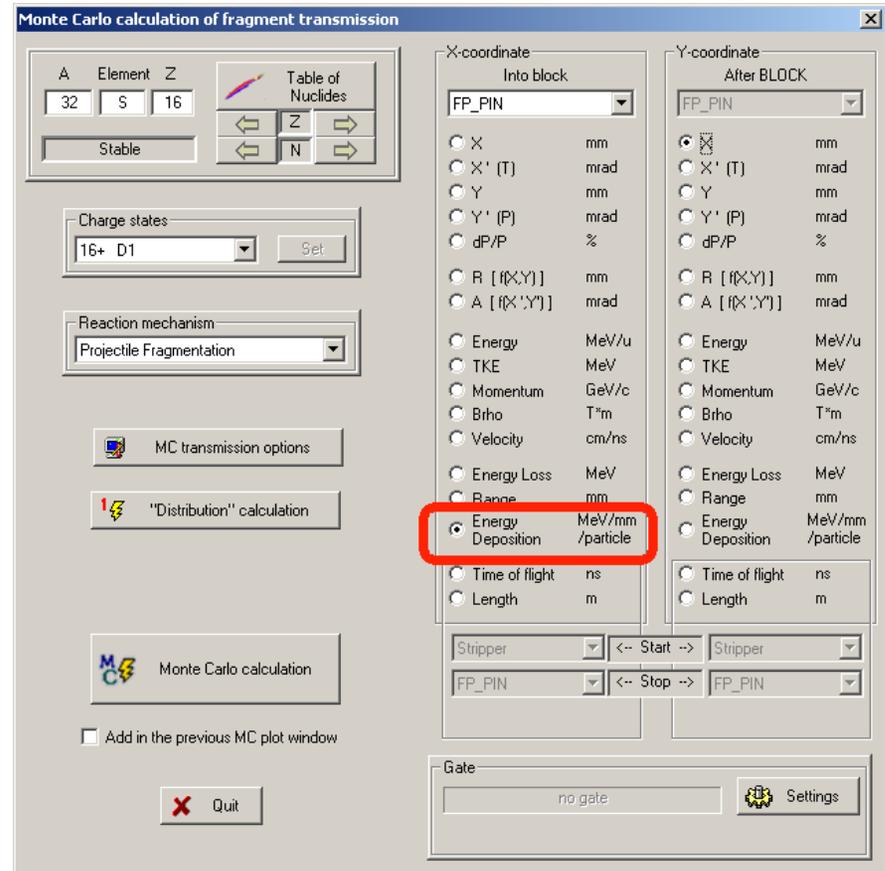


Version 8.0.29



The code operates under MS Windows environment and provides a highly user-friendly interface. It can be freely downloaded from the following internet addresses:

<http://www.nsci.msu.edu/lise>

<http://dnr080.jinr.ru/lise>

Monte Carlo calculation of fragment transmission

A: 32 Element: S Z: 16

Table of Nuclides

Stable

Change modes: 16+ D1 no stripper or target

Reaction mechanism: Projectile Fragmentation

MC transmission options

"Distribution" calculation

Monte Carlo calculation

Add in the previous MC plot window

Quit

X-coordinate: FP_PIN
 Y-coordinate: FP_PIN

X (mm)
 X' (T) (mrad)
 Y (mm)
 Y' (T) (mrad)
 dP/P (%)
 R [f(X,Y)] (mm)
 A [f(X',Y')] (mrad)
 Energy (MeV/u)
 TKE (MeV)
 Momentum (GeV/c)
 Brho (T*m)
 Velocity (cm/ns)
 Energy Loss (MeV)
 Range (mm)
 Energy Deposition (MeV/mm /particle)
 Time of flight (ns)
 Length (m)

Stripper: FP_PIN <- Start -> Stripper: FP_PIN
 FP_PIN <- Stop -> FP_PIN

Date: _____

both coordinates belong to one block in the case of energy deposition calculations

A chosen material is divided on $2 \cdot NP$ fragments (D_Z), where NP is the dimension of LISE distributions, which can be set in the "Options" dialog.

The code fills two distributions, which after sent to the MC plot subroutine instead two points as it was done for other MC modes.

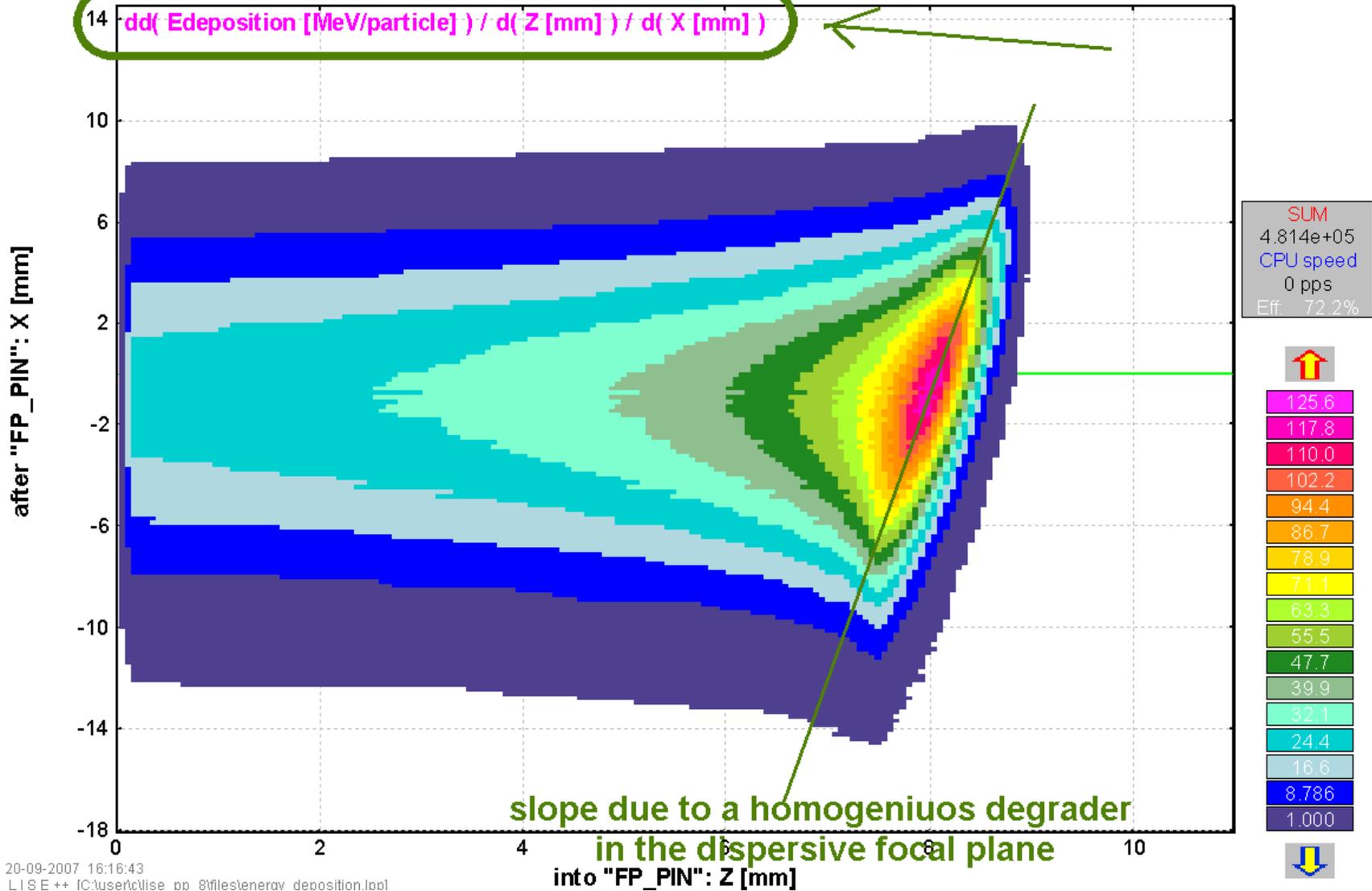
Dimension [E_deposition]:
MeV / particle / mm

At point "k" ($Z_k = D_Z \cdot k$)

$$E_{deposit}_k = (E_{loss}_k - E_{loss}_{k-1}) / D_Z$$

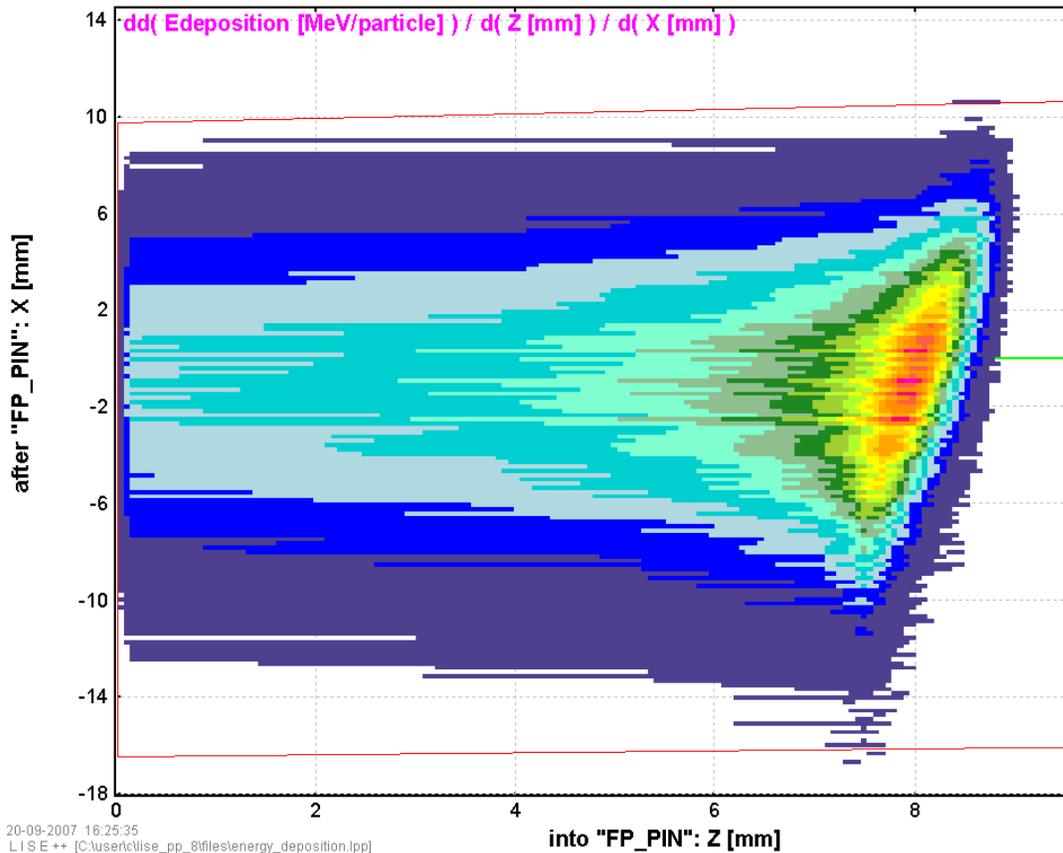
^{32}S : MC Transmission Plot - Energy Deposition

^{40}Ar (140.0 MeV/u) + Be (500 μm); Transmitted Fragment ^{32}S (Fragmentn)
 dp/p=5.07% ; Wedges: Al (500 μm); Brho(Tm): 3.4494, 3.4494, 3.3794, 3.3794
 "FP_PIN" : last block for MC calculation; no gate; Configuration: DDSWDDMSMMM



^{32}S : MC Transmission Plot - Energy Deposition

^{40}Ar (140.0 MeV/u) + Be (500 μm); Trasmitted Fragment ^{32}S (Fragmentn)
 $dp/p=5.07\%$; Wedges: Al (500 μm); Brho(Tm): 3.4494, 3.4494, 3.3794, 3.3794



Contour
 Area 4.12e+03
 Max 143

<X> 5.198
 <Y> -1.346
 dX 2.443
 dY 4.085

SUM
 1.696e+04
 CPU speed
 0 pps
 Eff 72%

↑

143.1
 134.2
 125.3

An area should be equal average energy loss by a particle in the material

Physical calculator

A: 32 Element: S Z: 16 Q: 16
 Stable

Energy: 128.962 MeV/u Energy: 128.962 AMeV
 Brho: 3.37831 Tm
 TKE: 4123.17 MeV
 Erho: 484.718 MJ/C Velocity: 14.3284 cm/ns
 P: 16204.7 MeV/c Beta: 0.477944
 p_tnspt: 1.012792 GeV/c Gamma: 1.138446

Alter: FP_slits Energy Remain: E-Loss

Block	Z \ Thickness	MeV/u	MeV	MeV	Q
FP_PIN	Si 10000 micron	0	0	4123.2	00
FP_PP...	Al 2 mg/cm2	0	0	0	
FP_SCI	C9H10 100 mm	0	0	0	

after/into: Si 10000 micron

Energy Remain: 0 MeV/u
 Energy Loss: 4123.2 MeV
 Energy Strag(sigma): 0.39503 MeV/u
 Angular Strag(sigma): 6.1059 mrad (plane)
 Lateral spread (sigma): 9.8084 microns
 Brho (for Q=Z): 0 Tm

Equilibrium values for material "Si"
 Charge State <Q>: 16
 dQ (sigma): 0.02
 Thickness: 1.4699 mg/cm2

Range and Energy Loss to: Si

Range: 1917.5 mg/cm2
 dRange (sigma): 4.0106 mg/cm2
 8229.63 micron 17.213 micron

Energy Remain: 0.000 MeV/u
 Material thickness: 1917.5 mg/cm2
 for energy rest: 8229.6 micron

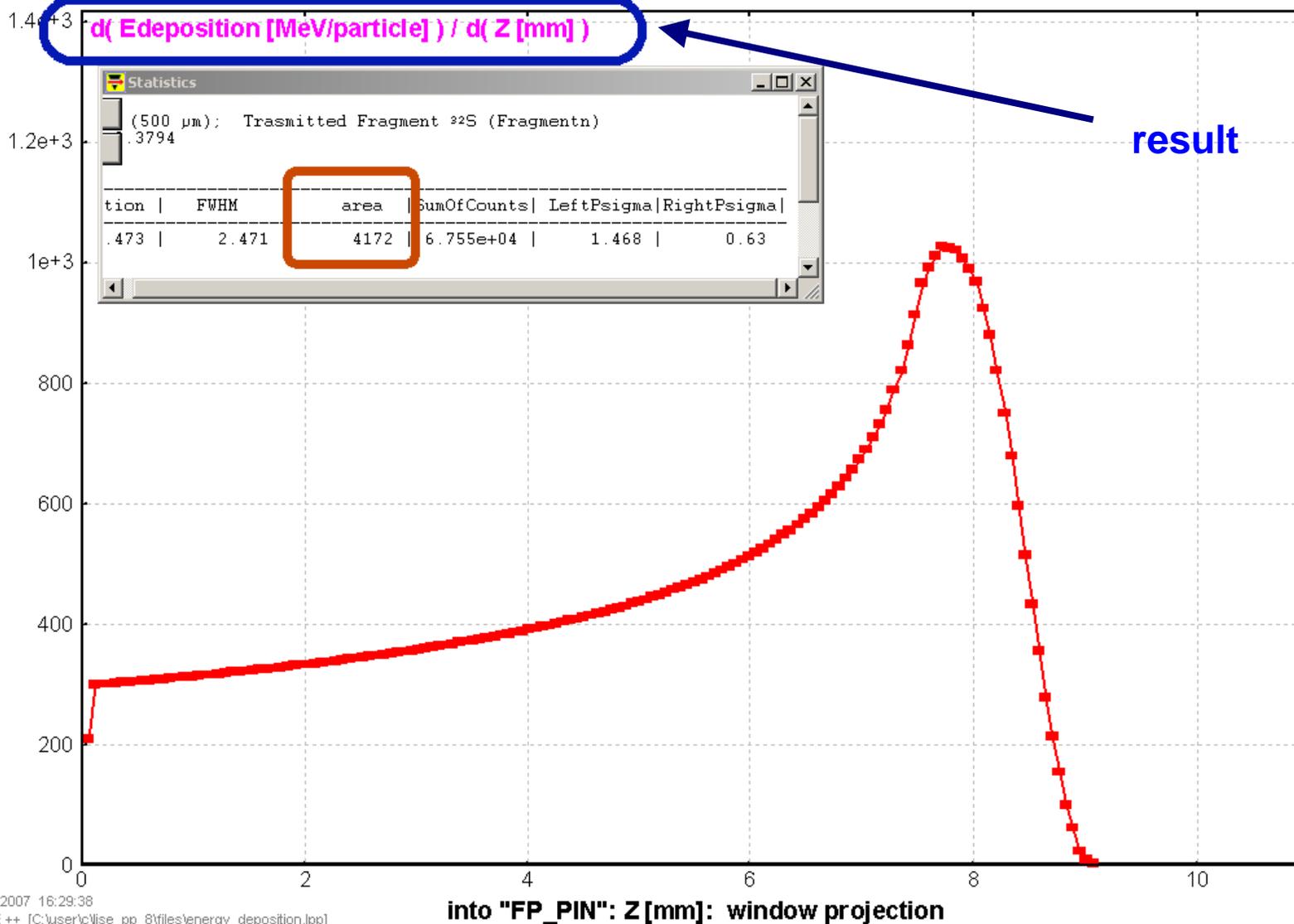
Calculation method of
 Energy Losses: 2 Energy straggling: 1
 Charge States: 3 Angular straggling: 1

Print Help Quit

20-09-2007 16:25:35
 L I S E ++ [C:\user\clise_pp_8\files\energy_deposition.lpp]

32S · MC Transmission Plot - Energy Deposition

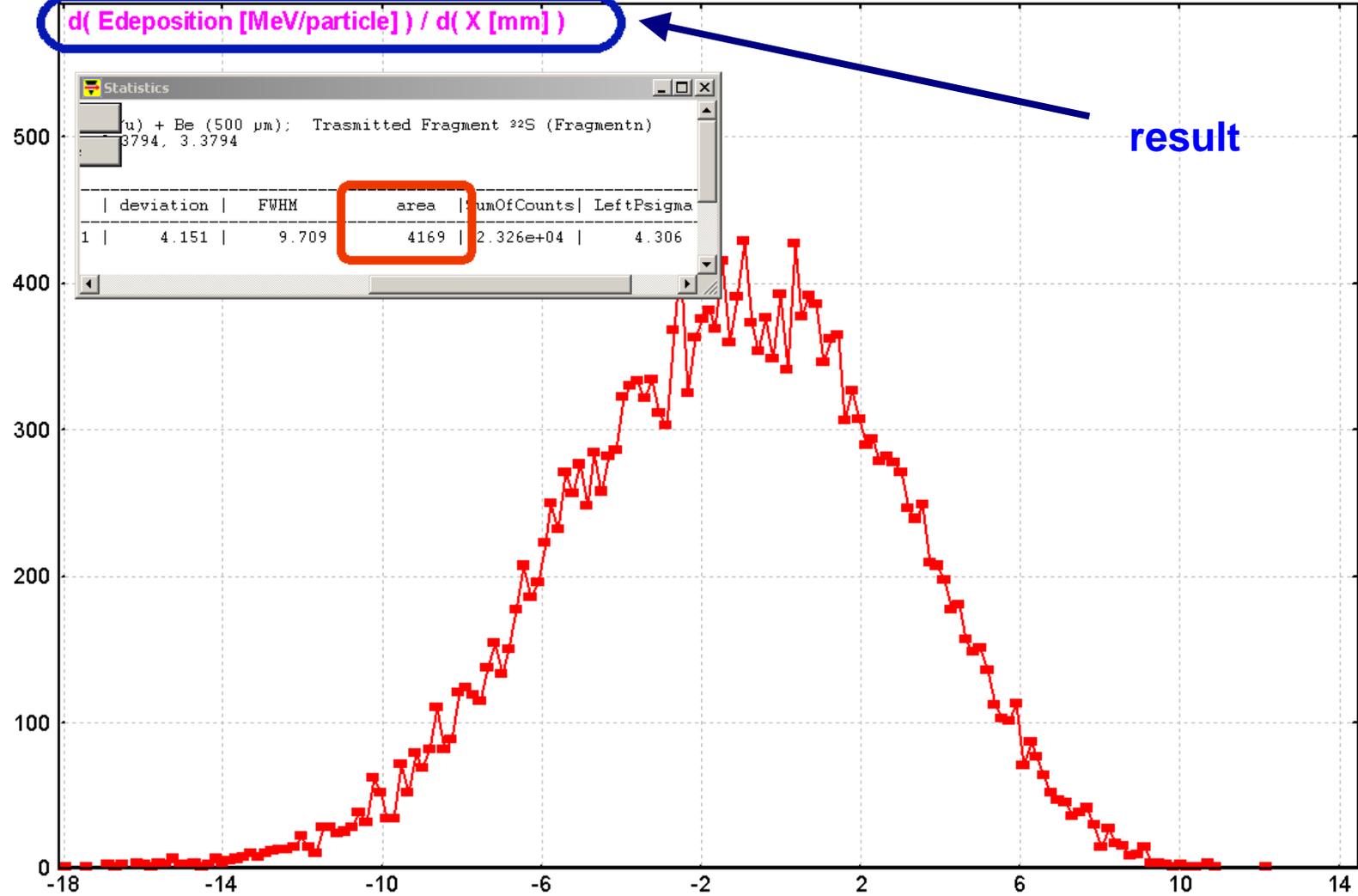
into "FP_PIN": Z [mm]: window projection -- ^{40}Ar (140.0 MeV/u) + Be (500 μm); Trasmitted Fragment ^{32}S (Fragmentn
 dpp=5.07% ; Wedges: Al (500 μm); Brho(Tm): 3.4494, 3.4494, 3.3794, 3.3794



32S : MC Transmission Plot - Energy Deposition

after "FP_PIN": X [mm]: window projection → ^{40}Ar (140.0 MeV/u) + Be (500 μm); Trasmitted Fragment ^{32}S (Fragmentn)
 up/p=3.07% , vedges: Al (500 μm); Brho(Tm): 3.4494, 3.4494, 3.3794, 3.3794

$d(\text{Edeposition [MeV/particle]}) / d(X [\text{mm}])$



result

07 16:34:56
 [C:\user\lise_pp_8\files\energy_deposition.lpp]

after "FP_PIN": X [mm]: window projection

No energy deposition calculations for target and stripper.

If you'd like to simulate that, then set a target thickness equal to 0, and add a material after the target (stripper) to visualize energy deposition.

**Recommended
NP-value for Energy
deposition
Calculations
is equal to 32**

Thanks to
Prof. Dave Morrissey
(NSCL/MSU)
for fruitful discussions