

## Version 8.0.14

The Two Body kinematics calculation has been implemented using the kinematic code developed for fission reactions for the analytical method ("Distribution") transmission calculation, as well as the new LISE Monte Carlo (v.7.9) method. The following assumptions used:

- the distribution of fragments is isotropic in the center mass system;
- the fragments are produced in their ground state;
- the cross sections are taken from EPAX by default, but is highly recommended to input realistic cross sections manually.

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 Element Z Table of Nuclides

Z

N

Beta+ decay

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Charge states

Set

---

Reaction mechanism

---

MC transmission options

"Distribution" calculation

**Show Prefragments**

Monte Carlo calculation

Add in the previous MC plot window

Quit

---

X-coordinate After BLOCK

X mm

X' (T) mrad

Y mm

Y' (P) mrad

dP/P %

Energy MeV/u

TKE MeV

Momentum GeV/c

Brho T\*m

Velocity cm/ns

Energy Loss MeV

Time of flight ns

Length m

Stripper  <-- Start --> Stripper

I2\_wedge  <-- Stop --> I2\_wedge

---

Y-coordinate After BLOCK

X mm

X' (T) mrad

Y mm

Y' (P) mrad

dP/P %

Energy MeV/u

TKE MeV

Momentum GeV/c

Brho T\*m

Velocity cm/ns

Energy Loss MeV

Time of flight ns

Length m

Stripper  <-- Start --> Stripper

I2\_wedge  <-- Stop --> I2\_wedge

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Gate

Settings

**Fission (Two body) fragment information**

Ex.energy

Fissile nucleus	<input type="text" value="6Li"/>	<input type="text" value="0.0"/>
Fragment (C *)	<input type="text" value="7Be"/>	<input type="text" value="0.0"/>
Residual (D *)	<input type="text" value="2H"/>	<input type="text" value="0.0"/>

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Final Fragment "C"

Max.Lab. Angle =  mrad

Fragment energy Max. =  MeV/u

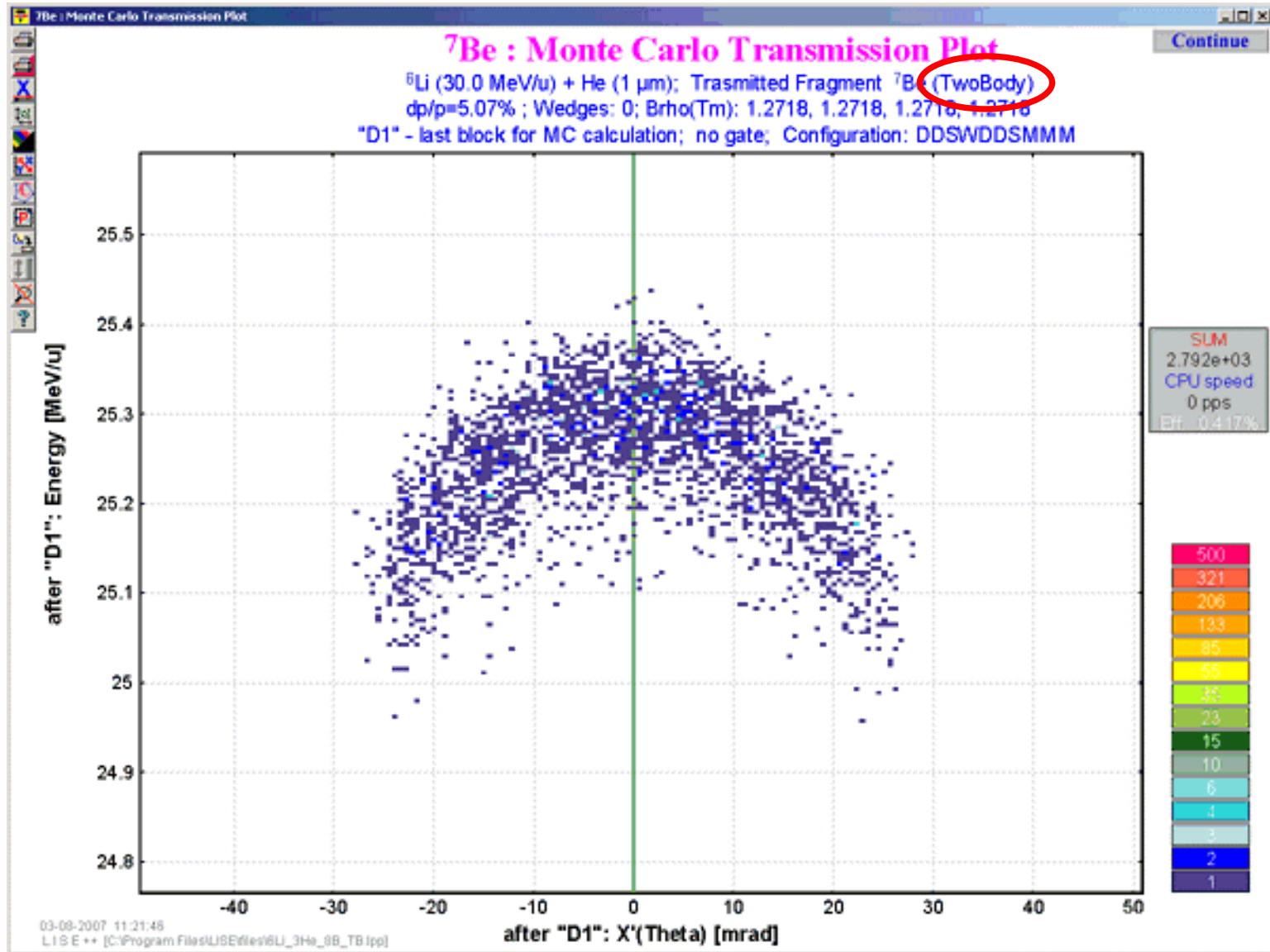
Fragment energy Min. =  MeV/u

Fissile nucleus energy =  MeV/u

Cross section =  mb

Close





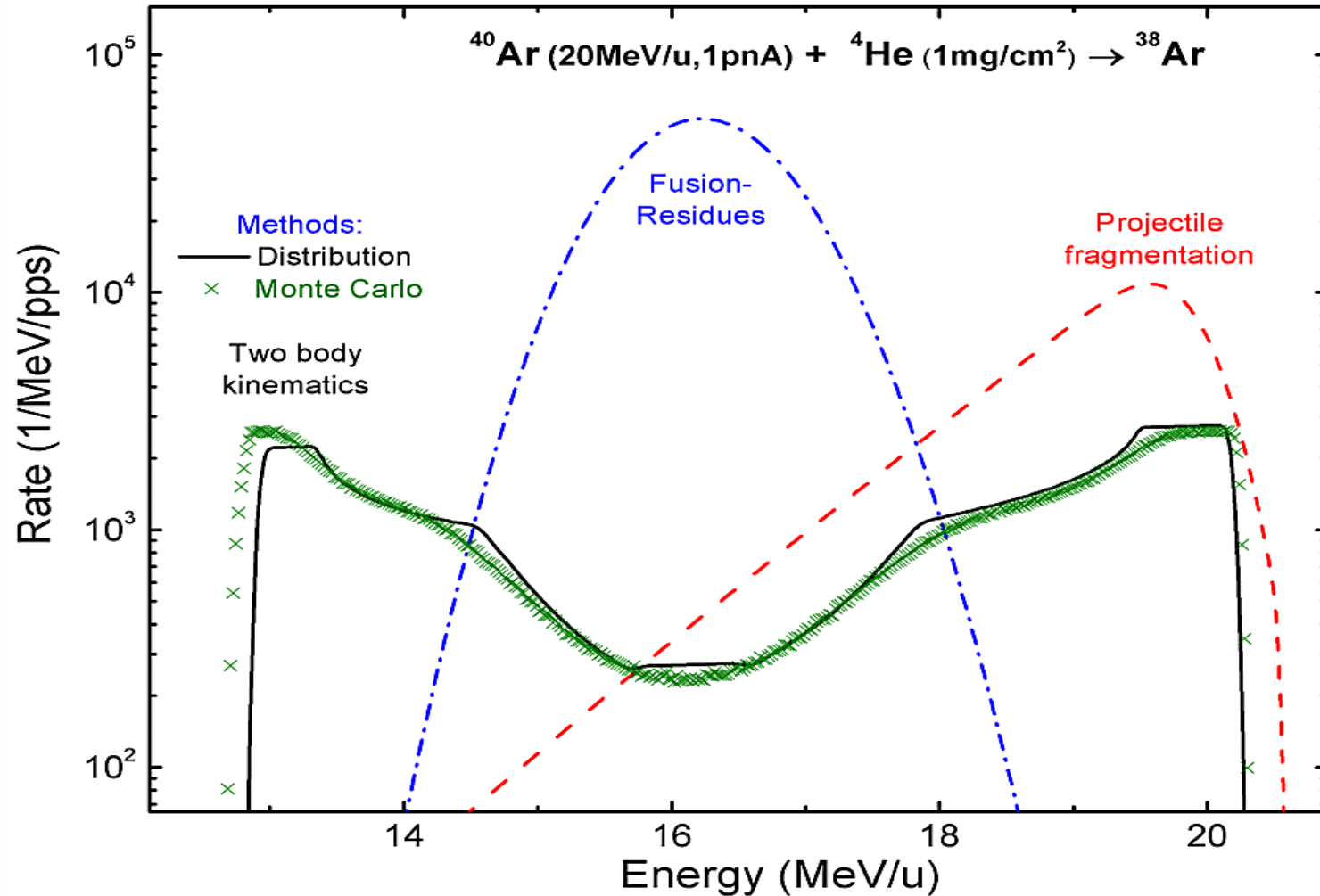


Figure. Energy spectra calculated by the "Distribution" method of  $^{38}\text{Ar}$  fragments produced by different reaction mechanisms, using an  $^{40}\text{Ar}$  beam at 20 MeV/u on a  $^4\text{He}$  target (1 mg/cm<sup>2</sup>) and gated by a rectangular angular acceptance  $X' = \pm 100\text{mrad}$ ,  $Y' = \pm 60\text{mrad}$ .

The Monte Carlo calculation of the energy spectrum of  $^{38}\text{Ar}$  fragment produced in two body reaction is also shown. The default LISE++ production cross sections EPAX 2.15 and LisFus model were used to estimate the rates.