Abrasion-Ablation in Secondary Reactions

v.17.3
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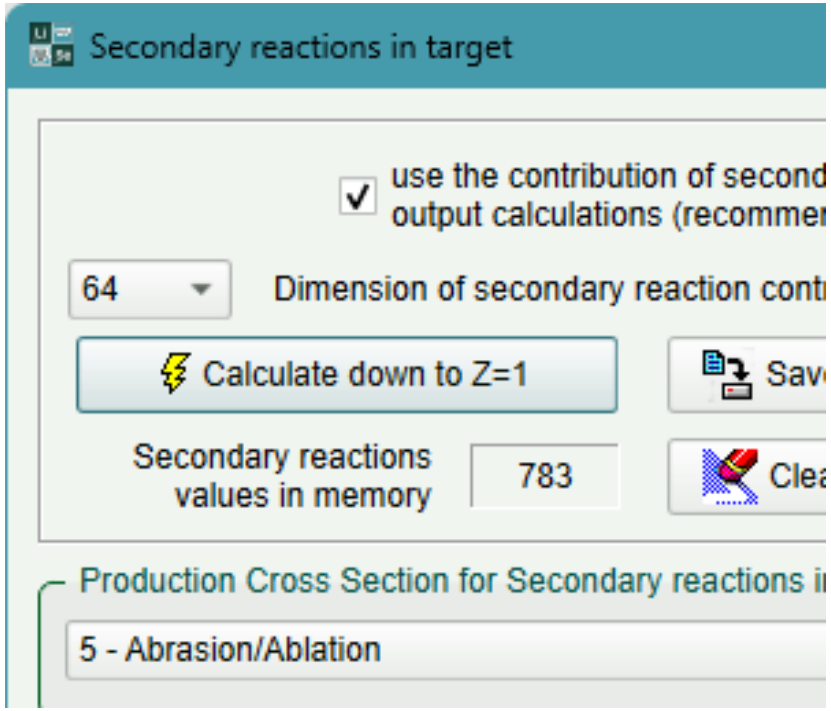
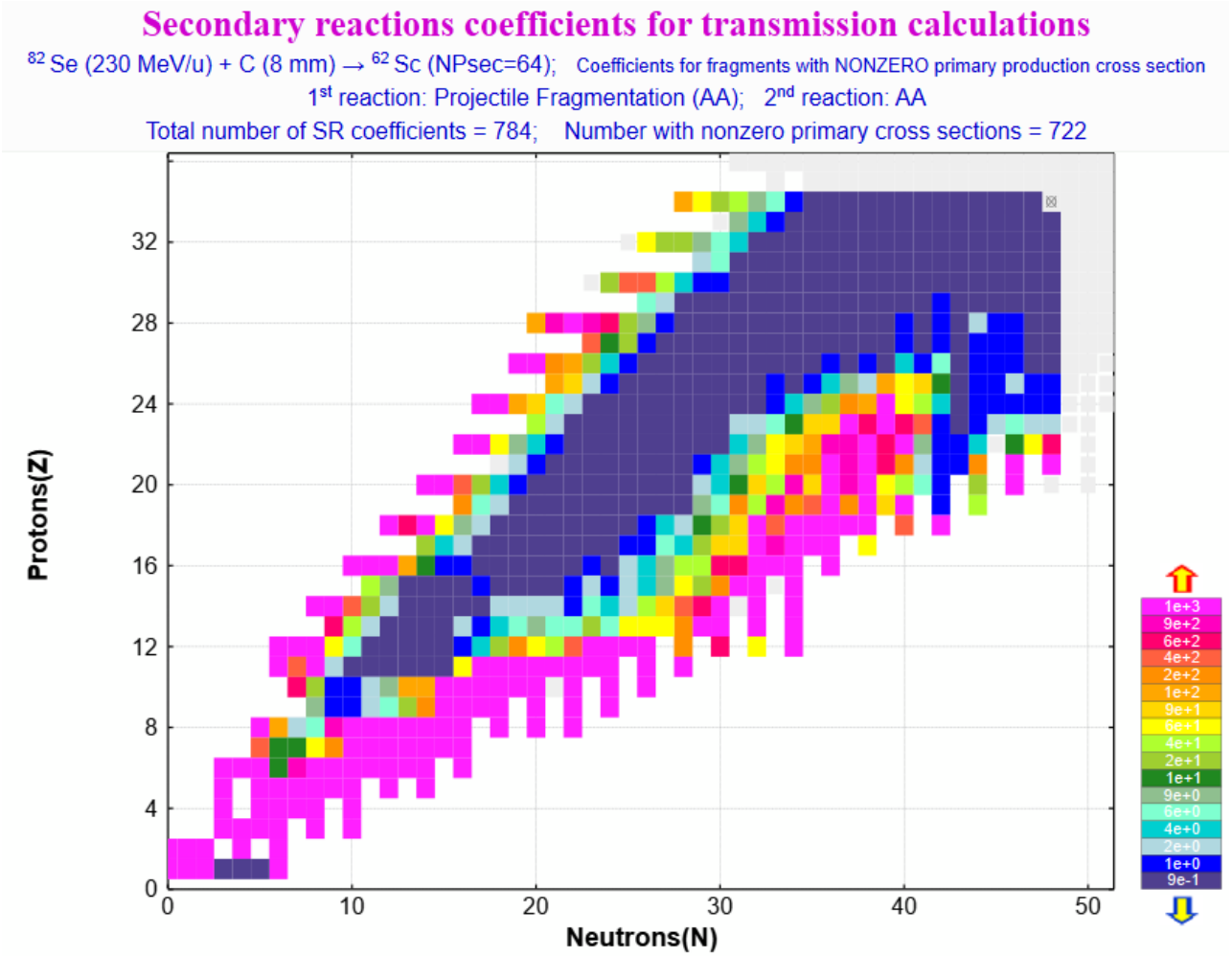
- Adding Abrasion-Ablation to Secondary reactions
- Optimization of Secondary Reaction calculations
- 4 ”fast” AA calculation modes
- Fitting the ^{82}Se MSU cross-sections with AA
- Changing distribution names in plots
- Plot distribution copy-paste
- Slopes X_{dest}/X_{wedge} and E_{dest}/X_{wedge} in wedge position shift plots

Adding Abrasion-Ablation to Secondary reactions



- Fast AA mode is used in Secondary Reactions
- Secondary Reactions mechanism has been updated to use AA calculations
- Still time-consumed. Parallelization?
- Important to apply AA parameters correctly associated to region under investigation



- Interesting results, which could be use for explanation of the “evaporation corridor” in the case of U-beams with thick targets
- The ^{82}Se MSU cross-sections have been refitted with AA to produce these calculations. See text further.

Optimization of Secondary Reaction calculations

F1 → F2

Cross section of production F2 from F1 is calculated only once, and kept in memory using Qmap

This optimization is also sufficient with using EPAX models in Secondary reactions

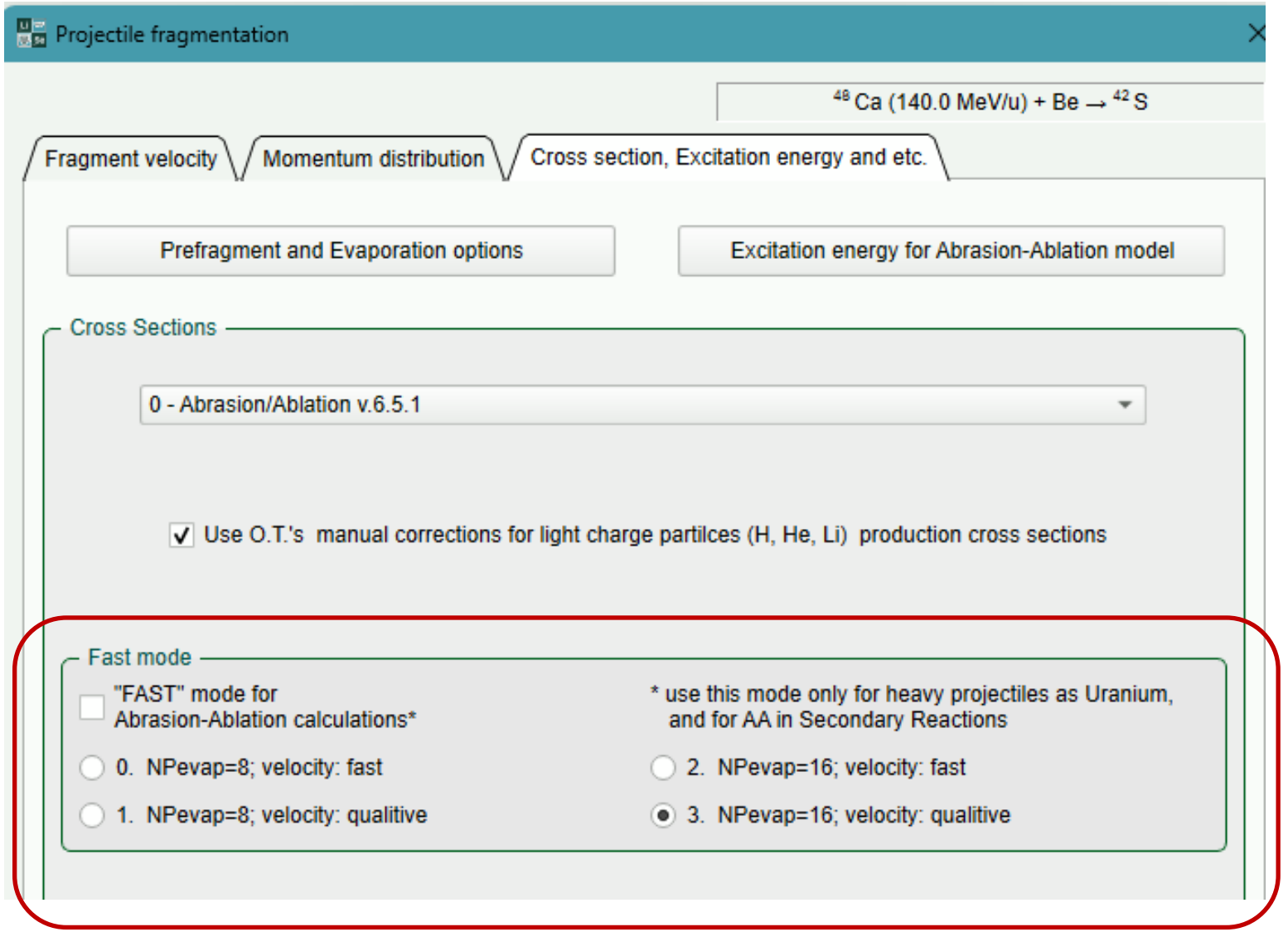
```
typedef QMap<int, double> mapCS;

mapCS* vmpCS = new mapCS[Nglobal];
```

```
double CStemp;
int index_iff = calc_index(indexZ[iff],indexN[iff]);
bool exist = vmpCS[ib].contains(index_iff);

if(exist)  CStemp = vmpCS[ib].value(index_iff);
else
  {
     CStemp = epax.yield(indexZ[iff],indexZ[iff]+indexN[iff],EPAX_option,false);
     vmpCS[ib].insert(index_iff, CStemp);
     lev3a++;
  }
```

Additionally internal modifications

- TGauge was optimized for AA use
- LastZ value was revised for AA use in Secondary Reactions
- Additional fast AA modes have been created

4 ”fast” AA calculation modes



Fitting the ^{82}Se MSU cross-sections with AA

34 different AA settings have been used to fitting ^{82}Se MSU cross-sections

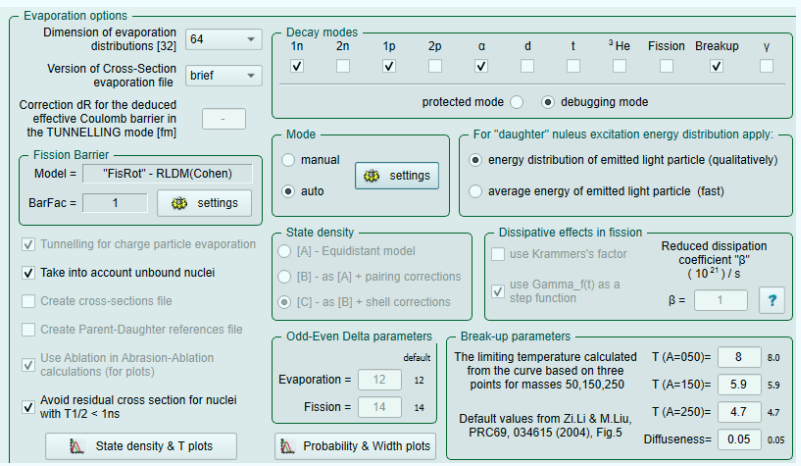
Last results

3rd day fits: new left bound, A>1 pair corrections, no2n

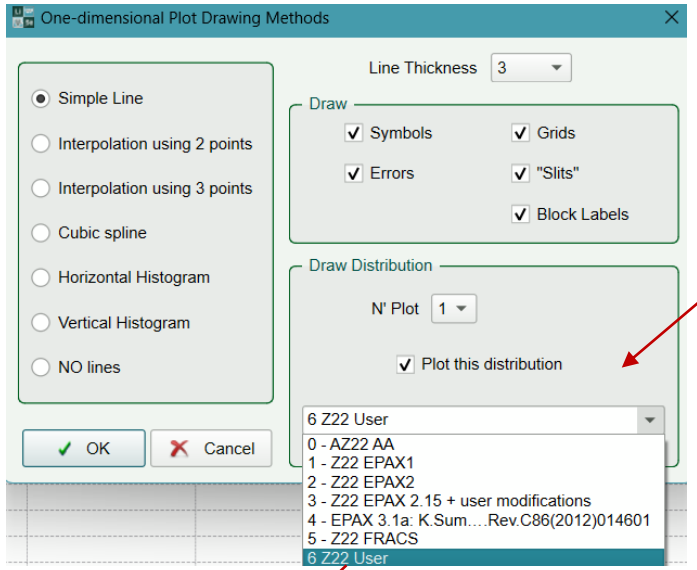
1.	NP=64 down to Z=21 N=48 WS4_RBF	4.89
2.	NP=64 down to Z=21 N=48 WS4_RBF MeanT	224
3.	NP=64 down to Z=21 N=48 WS4_RBF LogNorm	2180
4.	NP=64 down to Z=21 N=48 WS4_RBF with 2n	11.92
5.	NP=64 down to Z=21 Z=22 WS4_RBF	10.75
6.	NP=64 down to Z=21 N=48 WS4_RBF Thermo	5.21
7.	NP=64 down to Z=21 N=48 HFB22	4.49
8.	NP=64 down to Z=18 N=48 WS4_RBF	4.798
9.	NP=64 down to Z=21 N=48 WS4_RBF fast	8.94
10.	NP=64 down to Z=18 N=48 WS4_RBF A>70 pair corrections	14.1
7a.	Like 7 but Z=18	4.64

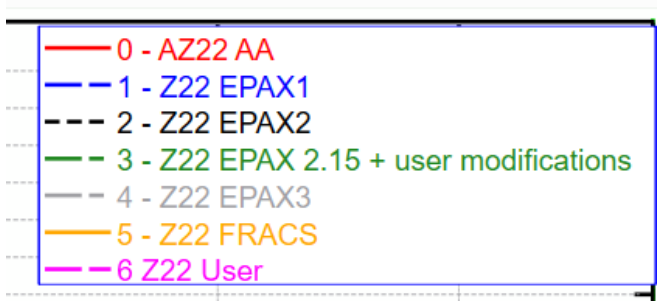
7a mode: best results down to Z=18

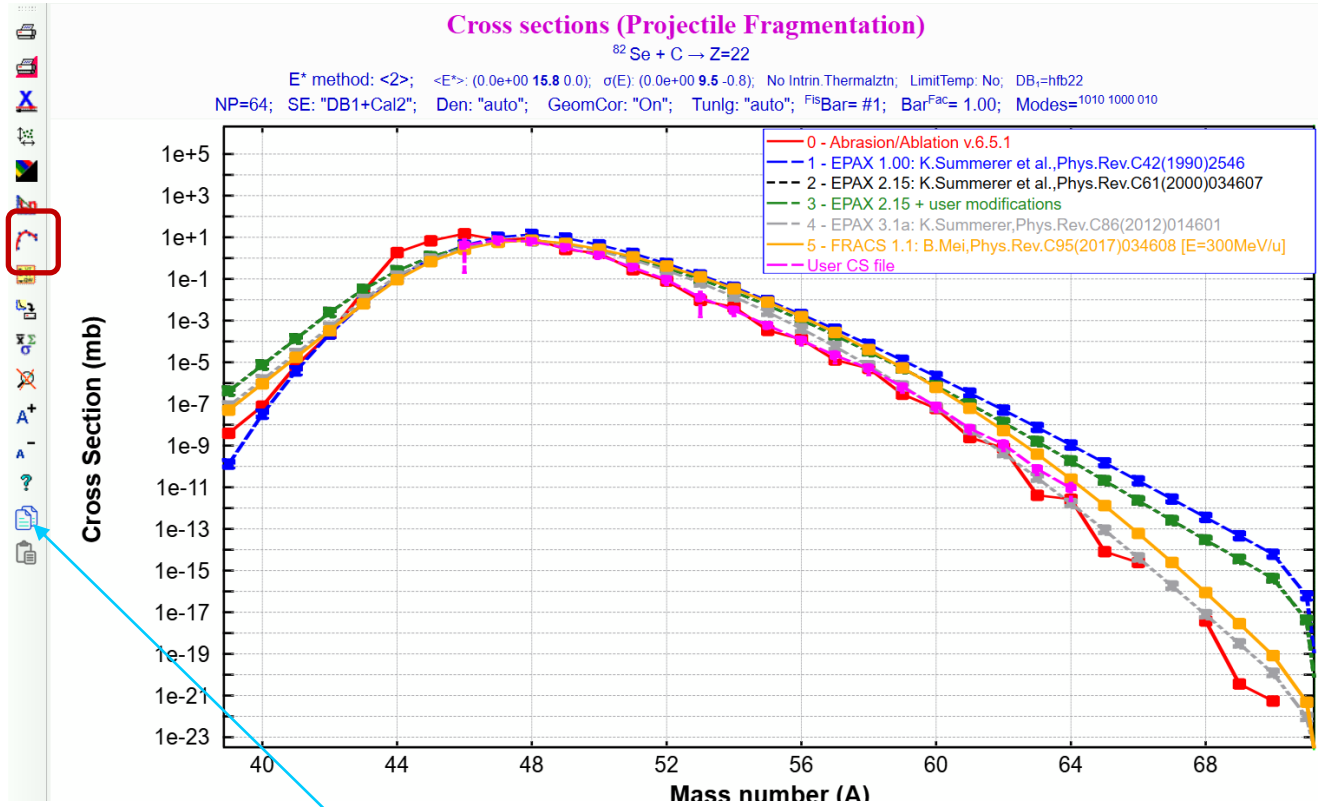
```
82Se (230.0 MeV/u) + C; ****  Local line N = 48; Last Z=18
NP=64;    SE: "DB1+Cal2";      Den: "auto";      GeomCor: "On";
Tunlg: "auto";   FisBar= #1;    BarFac= 1.00;    Modes=1010 1000 010
No Intrin.Thermalztn; LimitTemp: No;  DB1="hfb22";  ParticleDistribution=Quality
--------------------------------------------------------------------------------

N => Local: init=8 final=8;   Total: init=233, final=233

TARGET VALUEs: Initial    572.368  and Final   4.63657  LISE++ reduced values

Parameters :      LeftBound   <   Initial    <   RightBound |  Final
1. Energy #a1       +9.0e+00  <  +1.5902e+01  <  +3.0e+01   | +1.5841e+01
2. Energy #a2       -2.0e+00  <  +1.9400e-02  <  +2.0e+00   | +1.5763e-02
3.  Sigma #a1       +3.0e+00  <  +9.4273e+00  <  +2.0e+01   | +9.4954e+00
4.  Sigma #a2       -2.0e+00  <  -7.0620e-01  <  +2.0e+00   | -7.6994e-01
5. AA CS-factor     +5.0e-02  <  +6.5210e-01  <  +1.5e+00   | +6.8603e-01
```



Changing distribution names in plots



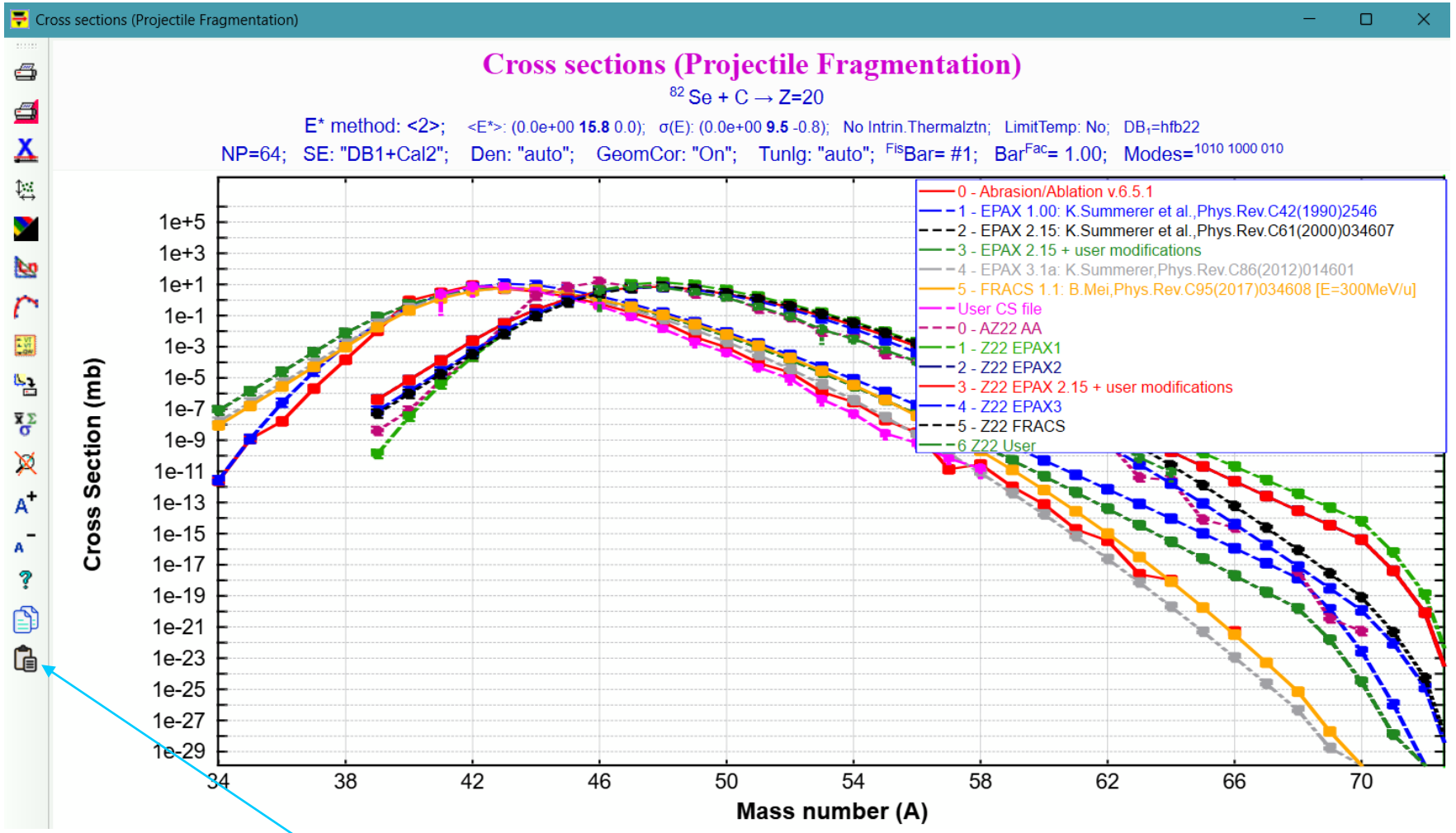




Copy these distributions to buffer

Plot distribution copy-paste

Let's copy distributions from previous Z=22 plot to Z=20 plot



Paste distributions to buffer to the current plot. Z22 distributions were copied to Z20 plot.

Slopes X_{dest}/X_{wedge} and E_{dest}/X_{wedge} in wedge position shift plots