Visualization of Fission Product Yield by NDPlot

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- Visualization of Fission Product Yield
- Summary

Contents

- Introduction of NDPlot
- Visualization of Fission Product Yield
- Summary

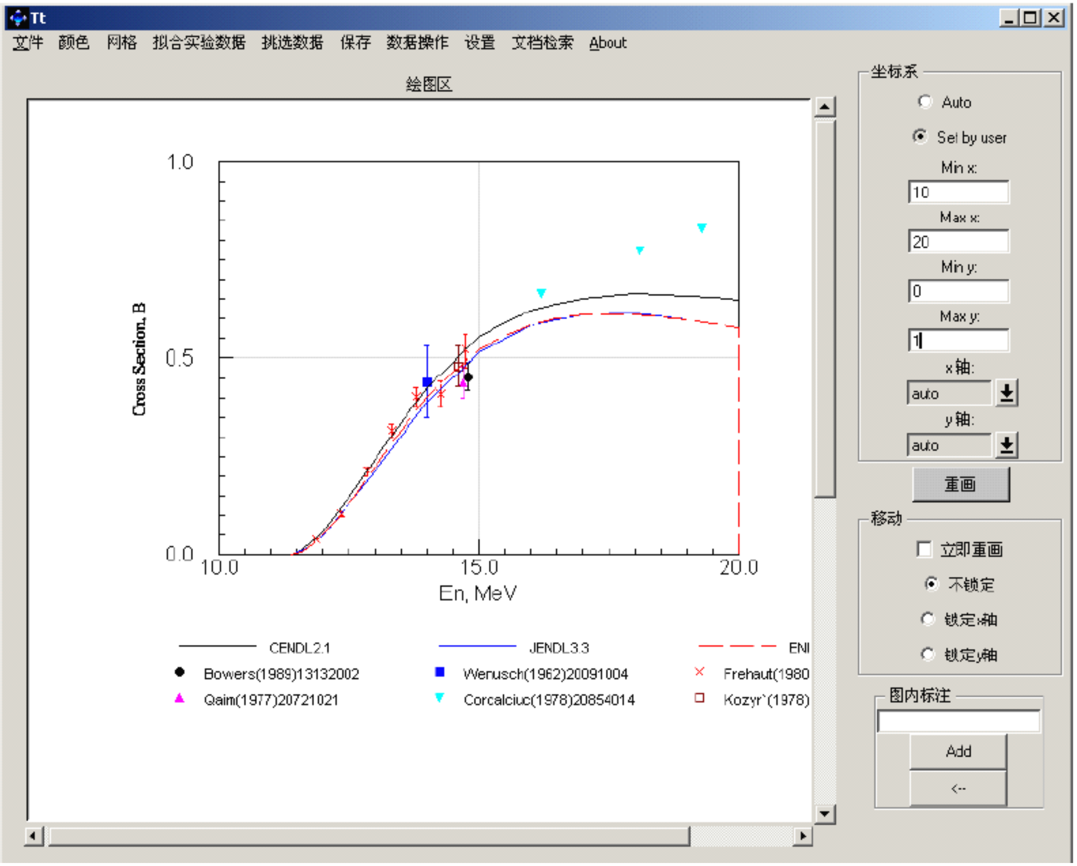
Introduction of NDPlot

■ History

- Since 1990s, CNDC has been devoting to develop plotting software for nuclear data. The first window’s plotting software named TT was released in 2002.
- TT is a Chinese abbreviation and short for “Tong Tiao（统调）”, it means comparison and adjustment.
- TT ‘s software structure is Client-Server.
- The sever has a database including ENDF and EXFOR.

Introduction of NDPlot

- History


Tt
文件
颜色
网格
拟合实验数据
挑选数据
保存
数据操作
设置
文档检索
About
绘图区
1.0
0.5
0.0
Cross Section, B
10.0
15.0
20.0
En, MeV
坐标系
重画
移动
图内标注
Add
<-

— CENDL2.1
— JENDL3.3
– – ENI
● Bowers(1989)13132002
■ Werusch(1962)20091004
× Frehaut(1980
▲ Qaim(1977)20721021
▼ Corcalciuc(1978)20854014
□ Kozyr`(1978)

○ Auto
● Sel by user
Min x: 10
Max x: 20
Min y: 0
Max y: 1
x轴: auto
y轴: auto
☐ 立即重画
● 不锁定
○ 锁定x轴
○ 锁定y轴

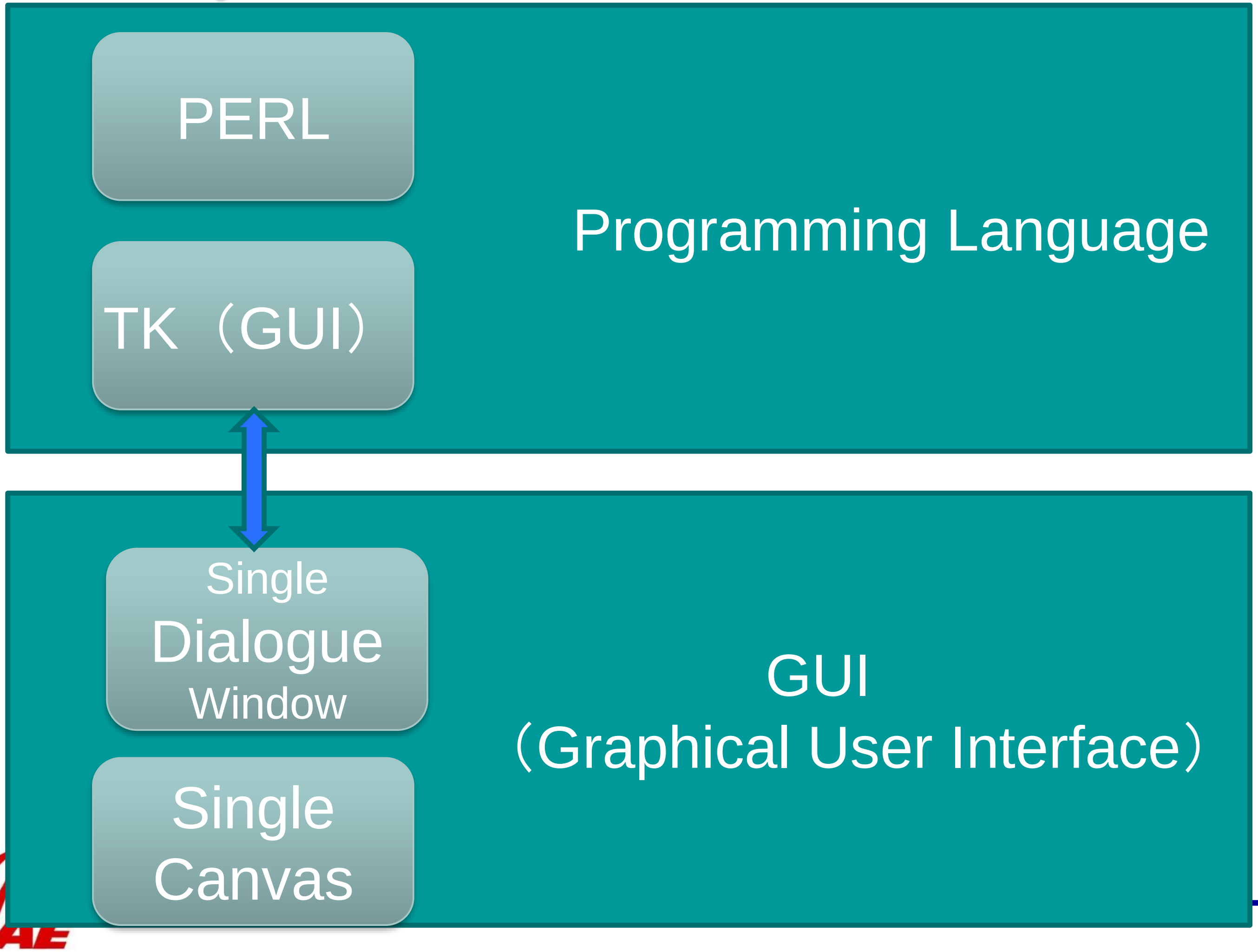
Interface of TT

- **TT example: 56Fe(n, 2n) reaction**

Introduction of NDPlot

- History

TT’s Development Platform



PERL

TK（GUI）

Programming Language

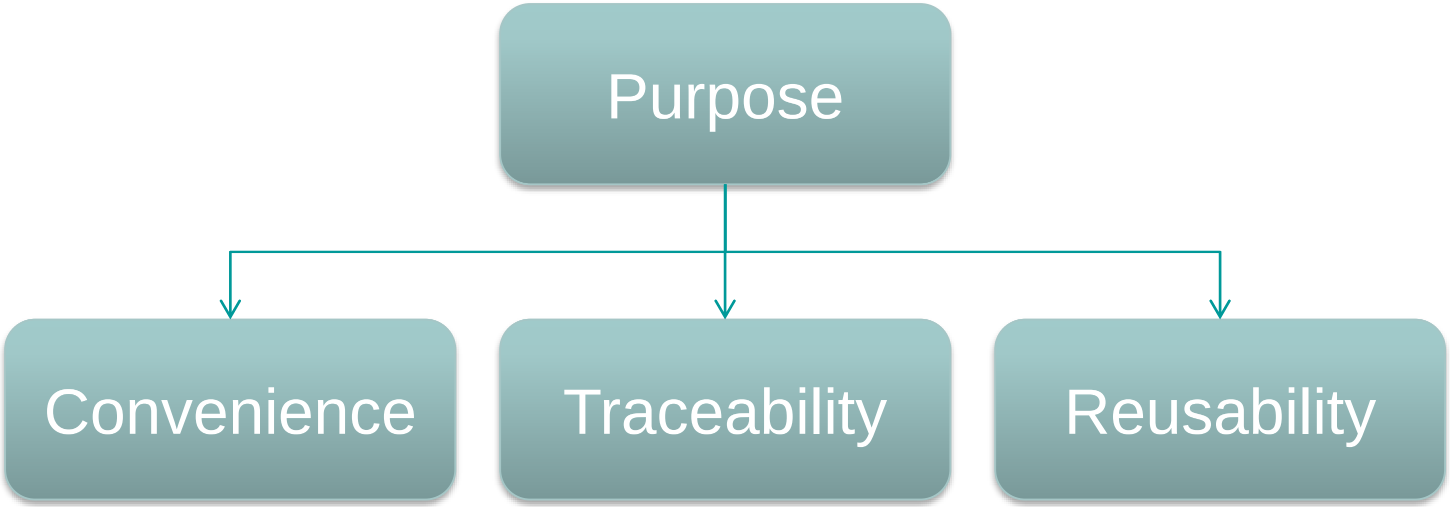
Single Dialogue Window

Single Canvas

GUI
（Graphical User Interface）

Introduction of NDPlot

- **NDPlot** is a more efficient nuclear data plotting tool, It's not only a plotting tool, but also a Integrated application software.
It can be seen as an updated version of TT.



Purpose

Convenience

Traceability

Reusability

Introduction of NDPlot

Convenience：Online, and All the experimental data and evaluated data are converted to uniform units

Traceability: lots of information **can be stored in a project file, users can view it at anytime they want. Information include: original data, plotting data, coordinate system, annotations, remarks.**

Reusability: You can save or continue the work at any time. Others can use the file to continue , examine or edit the file.

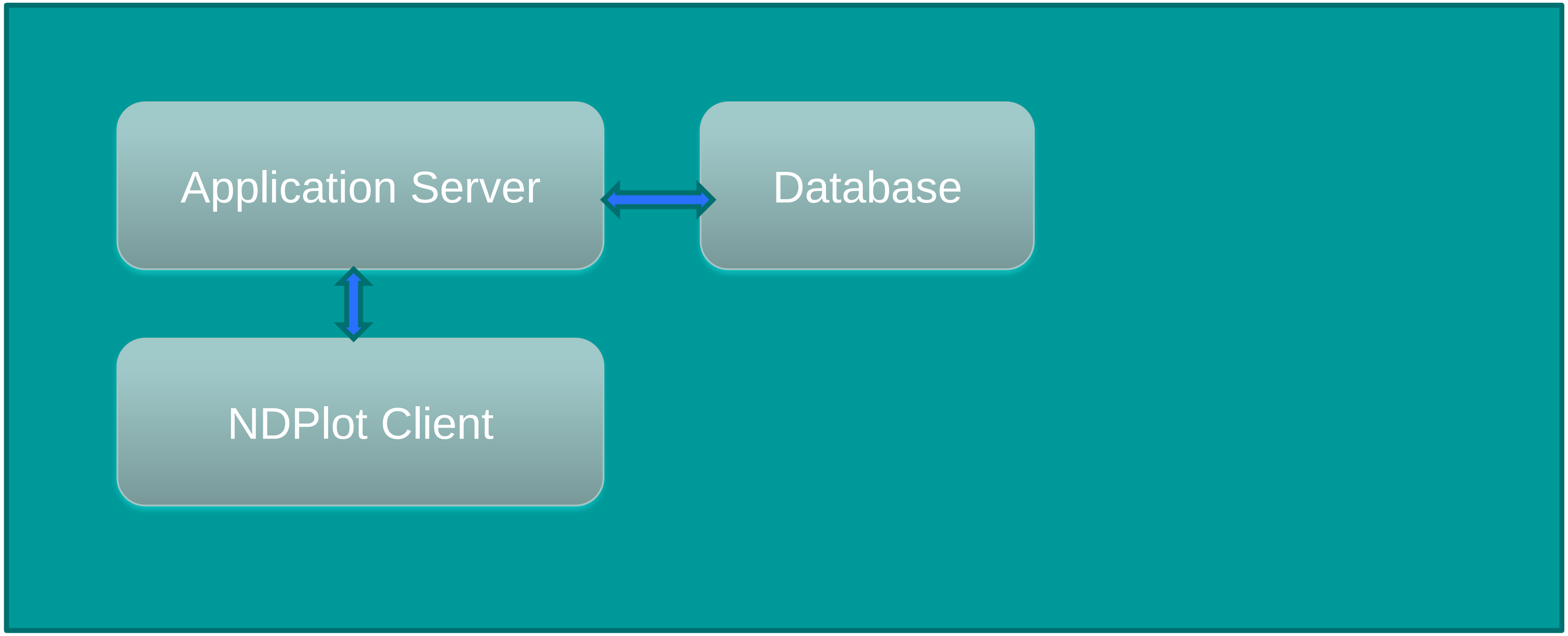
Introduction of NDPlot

Features of NDPlot

- Treatment of CS, DA, DE, DAE,MFQ,FY etc.;
- Using EXFOR, ENDF, and user-defined format data (free format);
- Saving project File;
- Exporting figures as jpg, eps, pdf, etc. ;
- Supporting Windows clipboard (word, ppt);
- Online retrieve & transfer the exp. and eval. data from the database.

Introduction of NDPlot

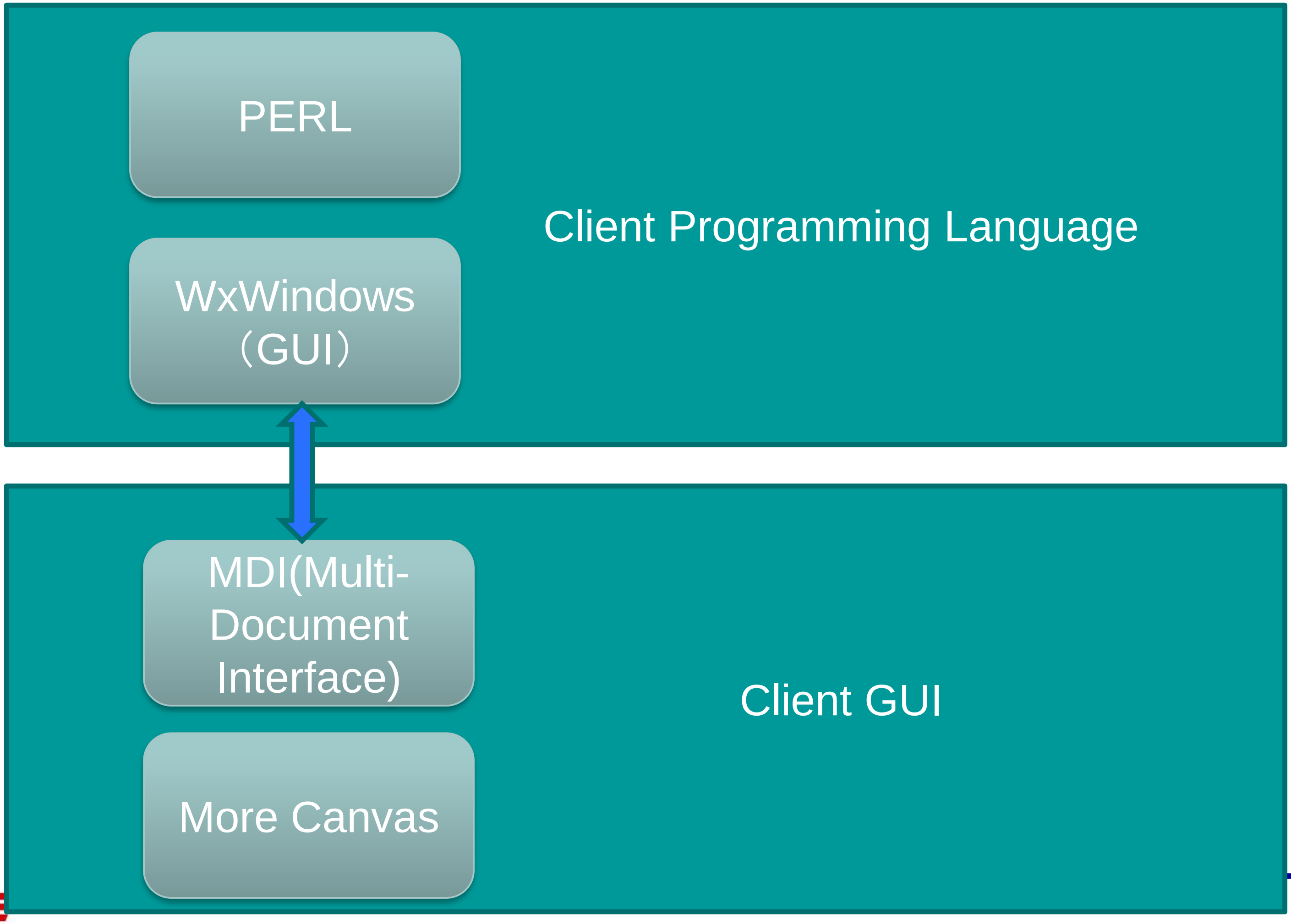
- Architecture of NDPlot


Application Server
Database
NDPlot Client

Client-Server Structure

Introduction of NDPlot

■Development Platform of NDPlot



PERL

WxWindows（GUI）

Client Programming Language

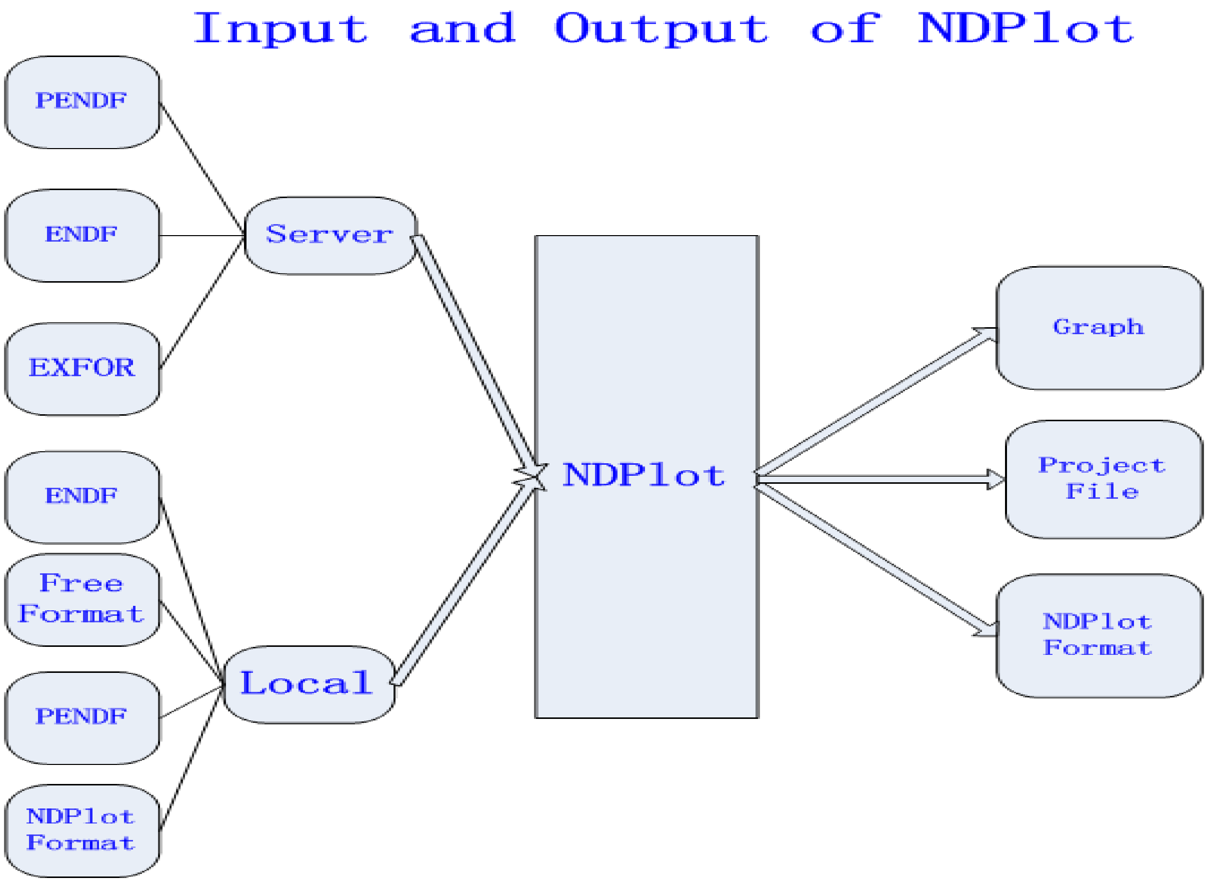
MDI(Multi-Document Interface)

More Canvas

Client GUI

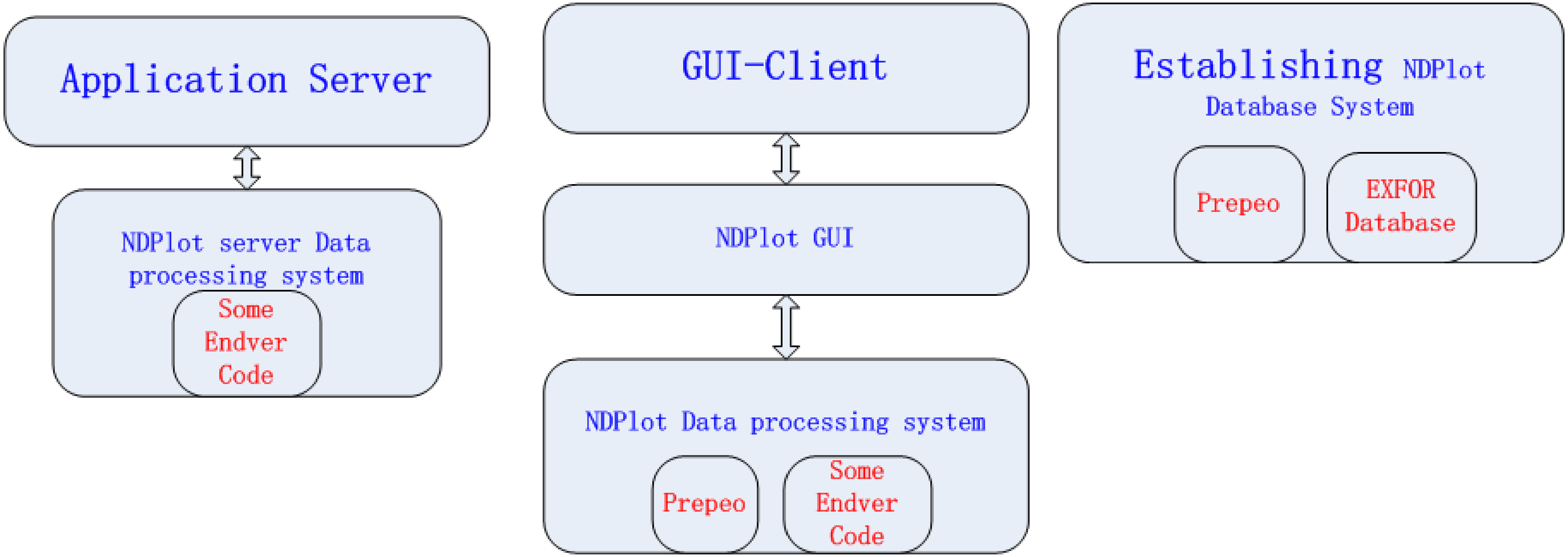
Introduction of NDPlot

- Input & Output


Input and Output of NDPlot
PENDF
ENDF
EXFOR
Server
ENDF
Free Format
PENDF
NDPlot Format
Local
NDPlot
Graph
Project File
NDPlot Format

Introduction of NDPlot

- Codes written by others are called by NDPlot:

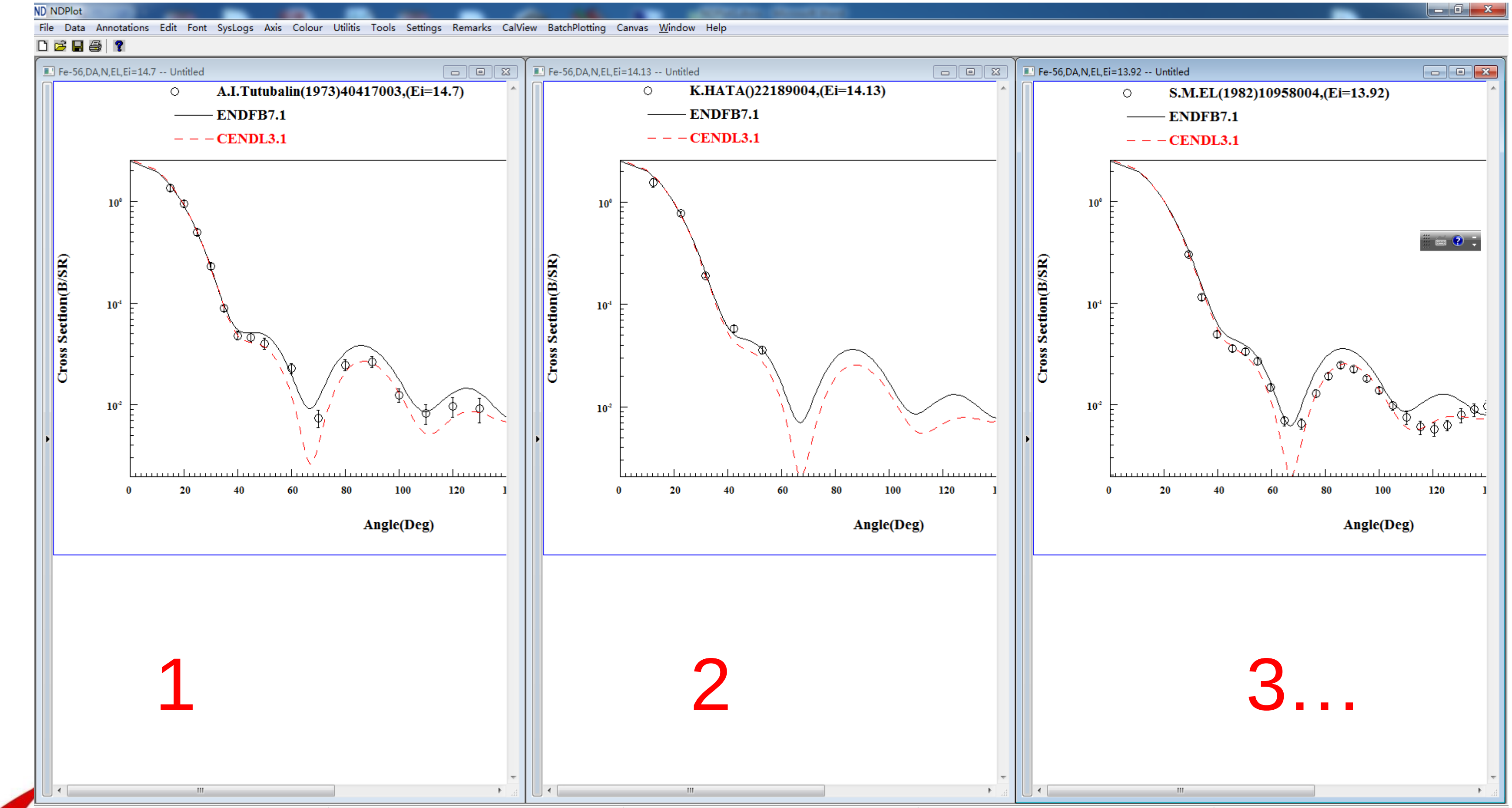

Application Server
NDPlot server Data processing system
Some Endver Code
GUI-Client
NDPlot GUI
NDPlot Data processing system
Prepeo
Some Endver Code
Establishing NDPlot Database System
Prepeo
EXFOR Database

1 Endver : **LSTTAB,X4TOC4.**

Prepro: **Convert** ENDF to PENDF

Introduction of NDPlot

- Interface


NDPlot
File Data Annotations Edit Font SysLogs Axis Colour Utilitis Tools Settings Remarks CalView BatchPlotting Canvas Window Help
Fe-56,DA,N,EL,Ei=14.7 -- Untitled
○ A.I.Tutubalin(1973)40417003,(Ei=14.7)
ENDFB7.1
CENDL3.1
Cross Section(B/SR)
Angle(Deg)
Fe-56,DA,N,EL,Ei=14.13 -- Untitled
○ K.HATA()22189004,(Ei=14.13)
ENDFB7.1
CENDL3.1
Cross Section(B/SR)
Angle(Deg)
Fe-56,DA,N,EL,Ei=13.92 -- Untitled
○ S.M.EL(1982)10958004,(Ei=13.92)
ENDFB7.1
CENDL3.1
Cross Section(B/SR)
Angle(Deg)

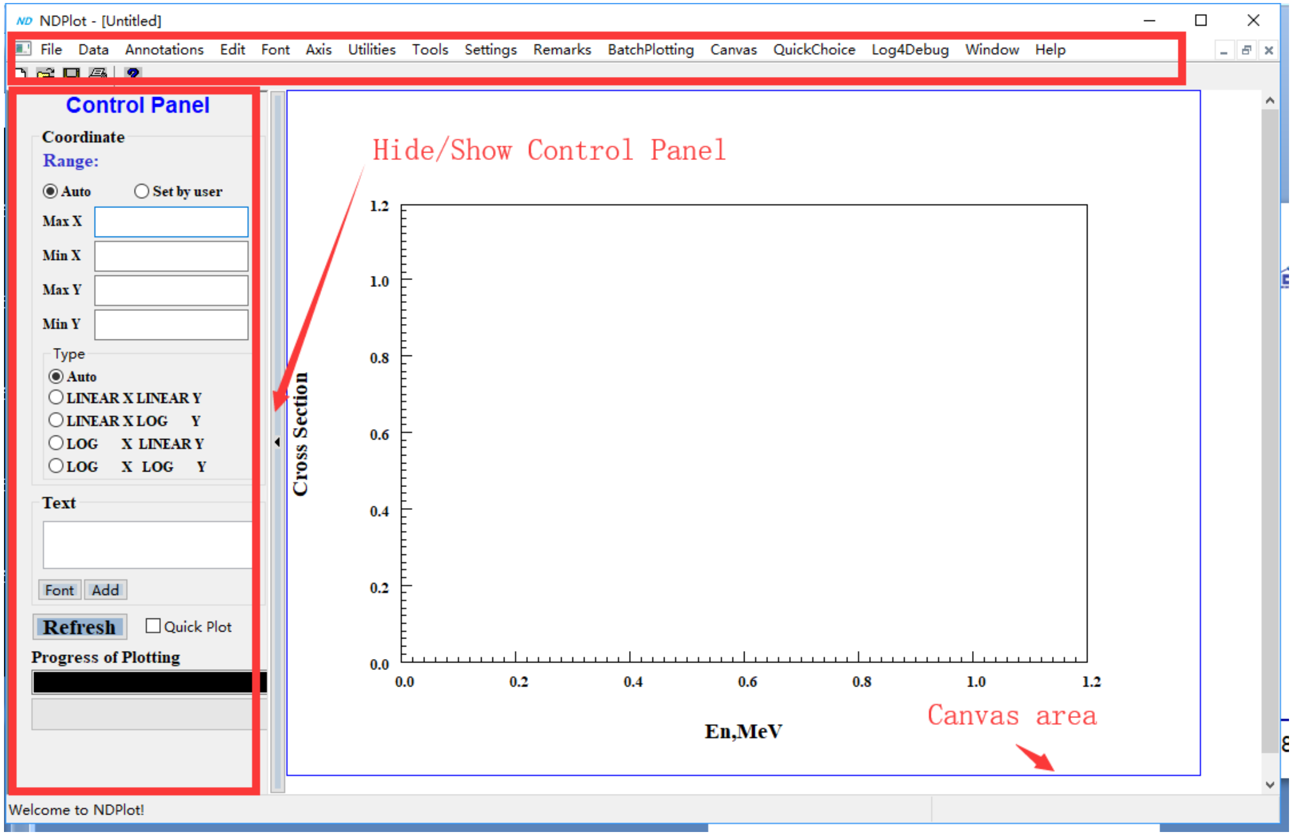
1

2

3…

Introduction of NDPlot

- Screenshot


NDPlot - [Untitled]
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
Control Panel
Font
Add
Refresh
Progress of Plotting
Cross Section
En,MeV
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2

Control Panel

Coordinate

Range:

● Auto ○ Set by user

Max X

Min X

Max Y

Min Y

Type

● Auto

○ LINEAR X LINEAR Y

○ LINEAR X LOG Y

○ LOG X LINEAR Y

○ LOG X LOG Y

Text

☐ Quick Plot

Welcome to NDPlot!

Hide/Show Control Panel

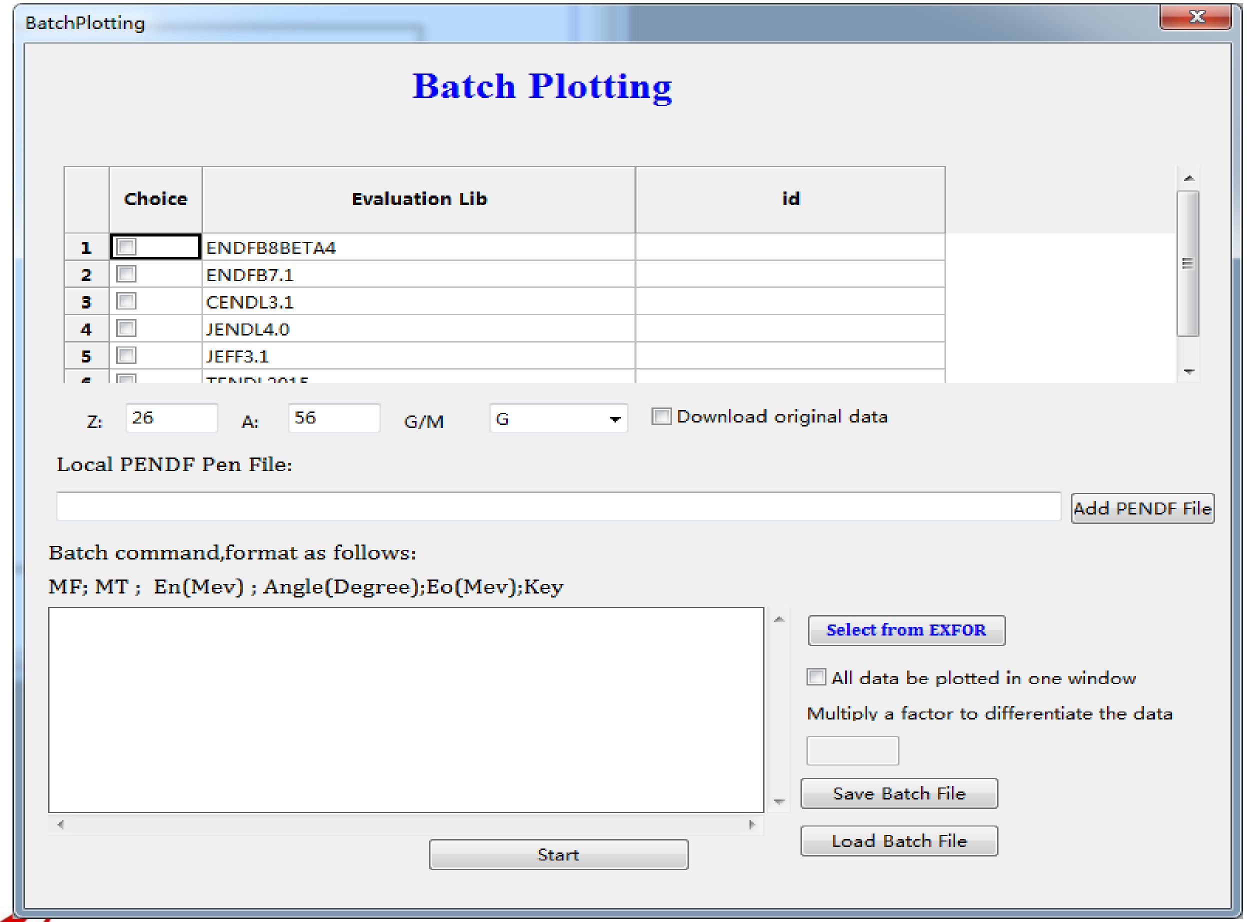
Canvas area

MainFrame:
Menu bar

ChildFrame:
Control Panel
Canvas

Introduction of NDPlot

- Batch Plotting(DA,DE,DAE)



BatchPlotting

Batch Plotting

	Choice	Evaluation Lib	id
1	☐	ENDFB8BETA4	
2	☐	ENDFB7.1	
3	☐	CENDL3.1	
4	☐	JENDL4.0	
5	☐	JEFF3.1	
6	☐	TENDL2015	

Z: 26 A: 56 G/M G

☐ Download original data

Local PENDF Pen File:

Batch command,format as follows:

MF; MT ; En(Mev) ; Angle(Degree);Eo(Mev);Key

☐ All data be plotted in one window

Multiply a factor to differentiate the data

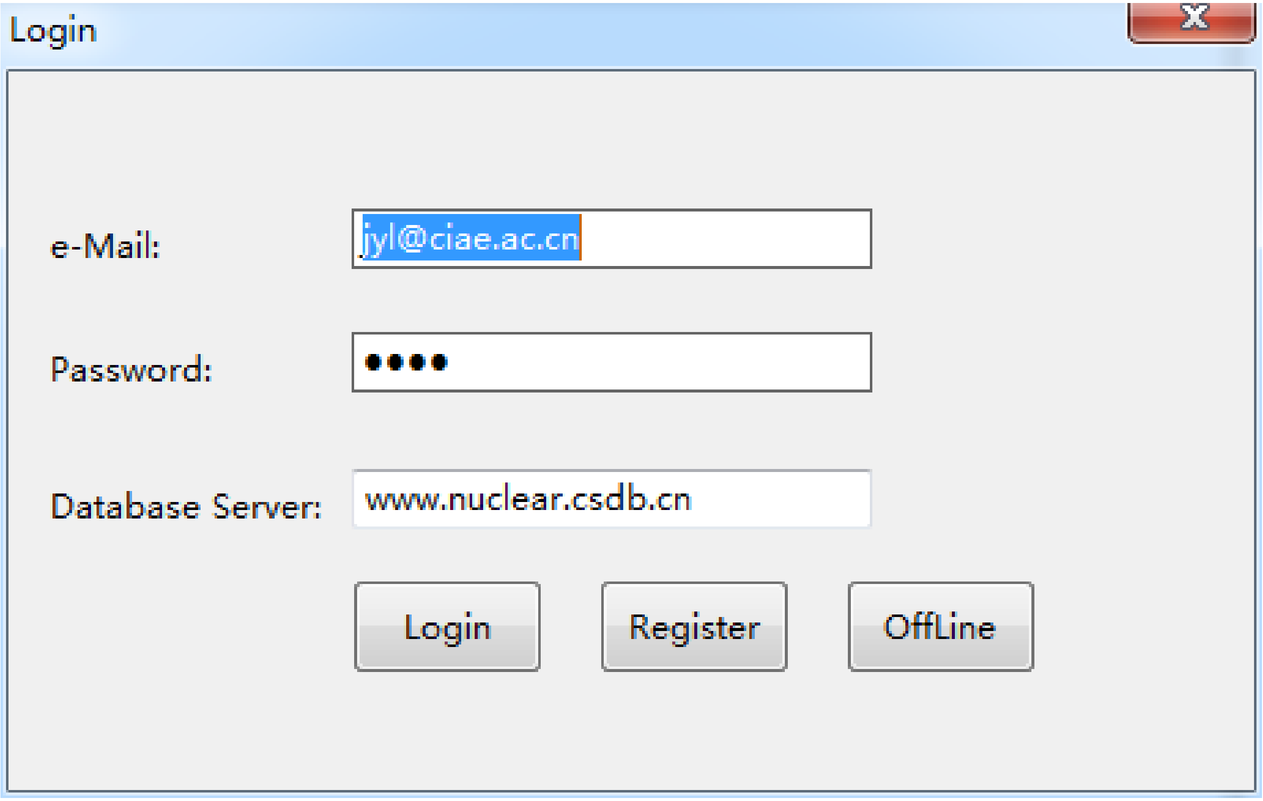
Add PENDF File
Select from EXFOR
Save Batch File
Load Batch File
Start

The data can be plotted in one or more windows.

It can plot more than one reaction at the same time.

Introduction of NDPlot

■Register And Login


Login
x

e-Mail: jyl@ciae.ac.cn

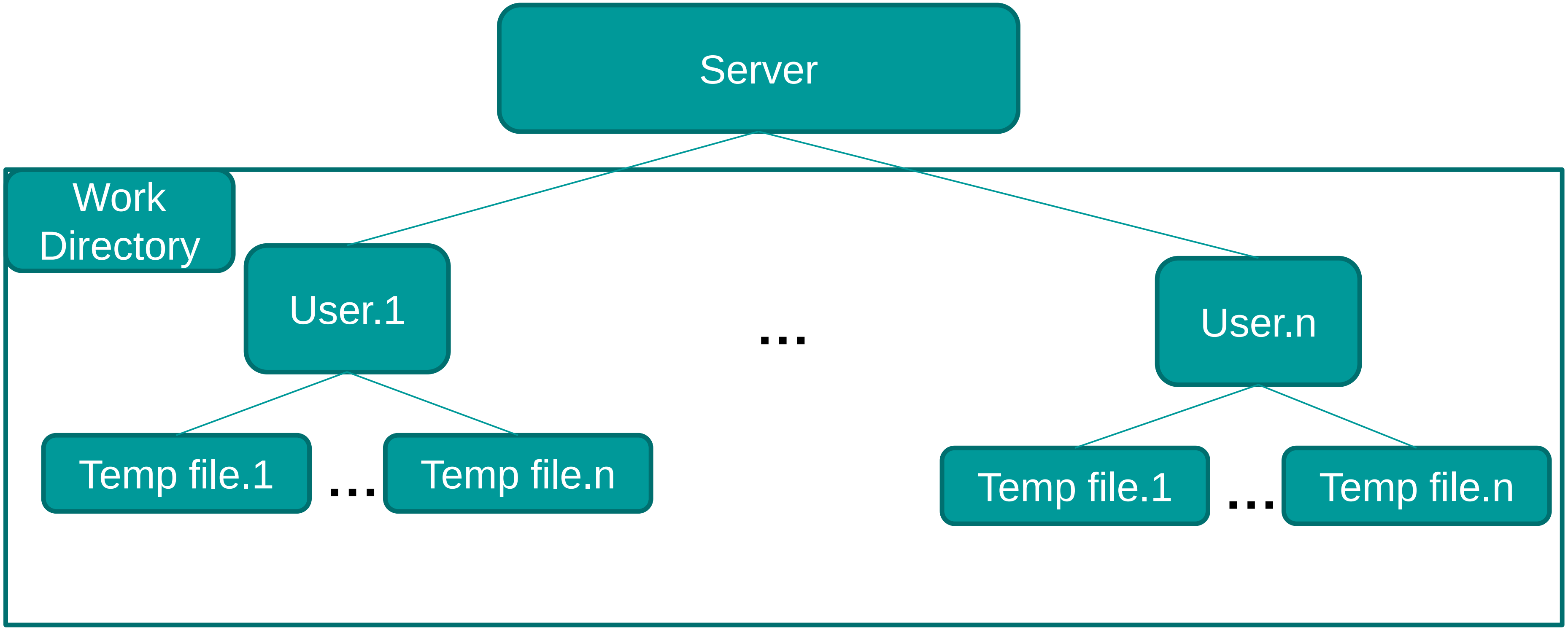
Password: ●●●●

Database Server: www.nuclear.csdb.cn

Login
Register
OffLine

Introduction of NDPlot

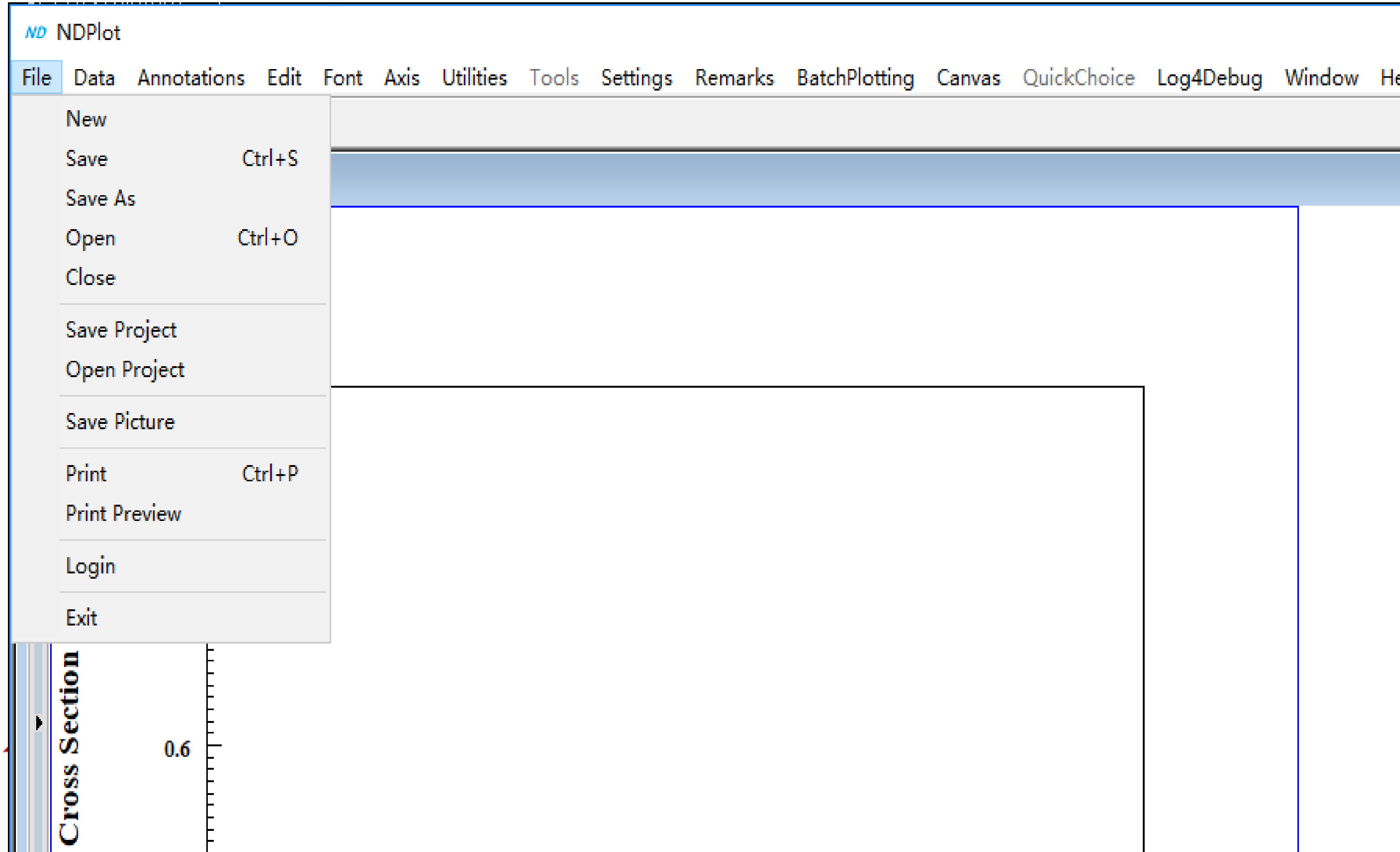
- Why need to register?


Server
Work Directory
User.1
…
User.n
Temp file.1
…
Temp file.n
Temp file.1
…
Temp file.n

Solving resource conflict on server side

Introduction of NDPlot

■[File Menu]


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
He
New
Save Ctrl+S
Save As
Open Ctrl+O
Close
Save Project
Open Project
Save Picture
Print Ctrl+P
Print Preview
Login
Exit
Cross Section
0.6

Introduction of NDPlot

File->New: Create a new window（ChildFrame）
File->Save （AS）： Save current window（.ND）(Ctrl+S)
File->Open：Open a ND file(.ND) (Ctrl+O)
File->Save Project : All windows will be stored（.NDS）
File->Open Project: Open a project File（.NDS）
File->Close : Close Current ChildFrame.

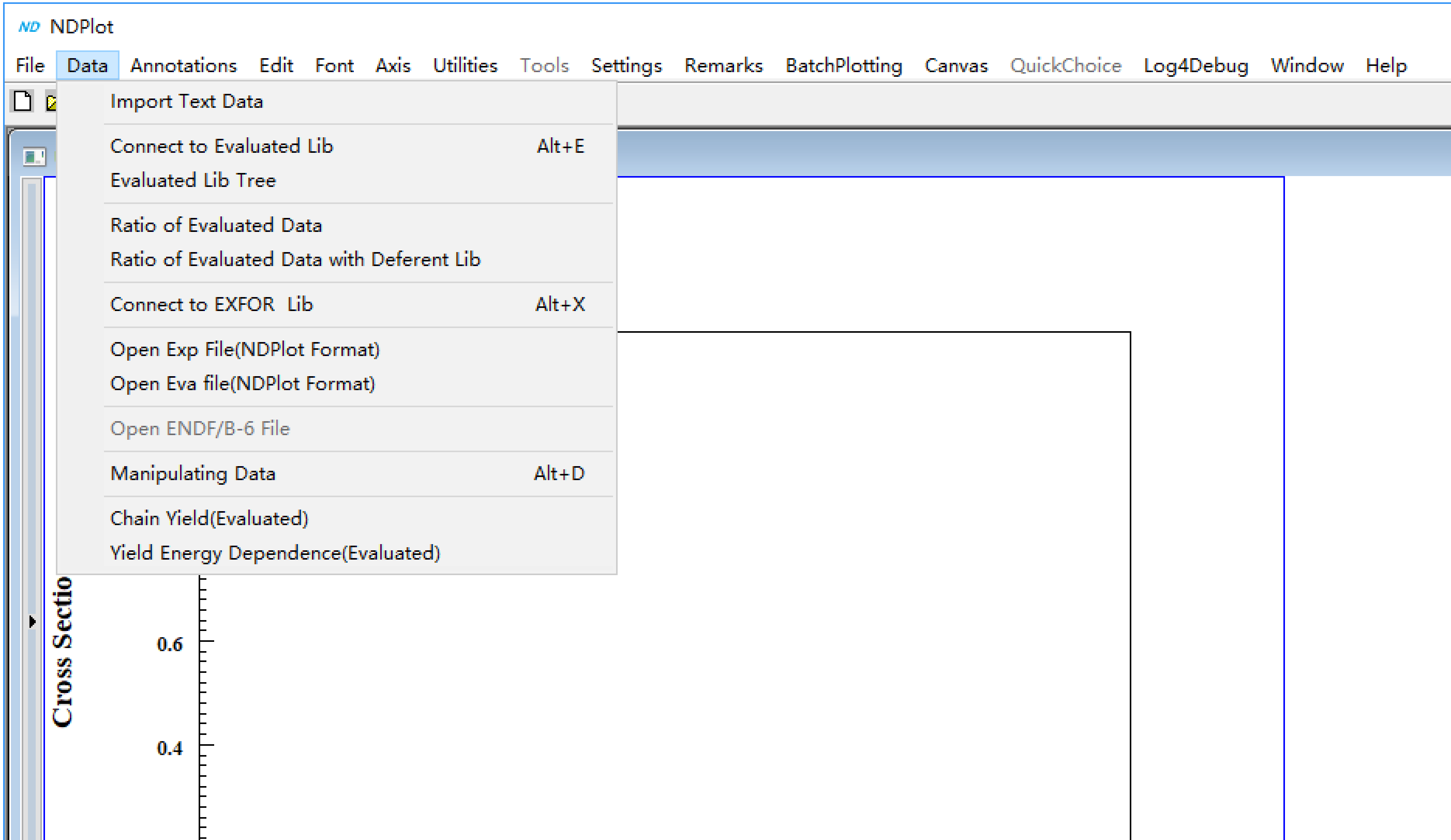
File->Print Preview
File->Print (Ctrl+P)

File->Save Picture：Output current window as a picture(JPG,BMP,GIF,PNG);

File->Login: Online
File->Exit

Introduction of NDPlot

■[Data Menu]

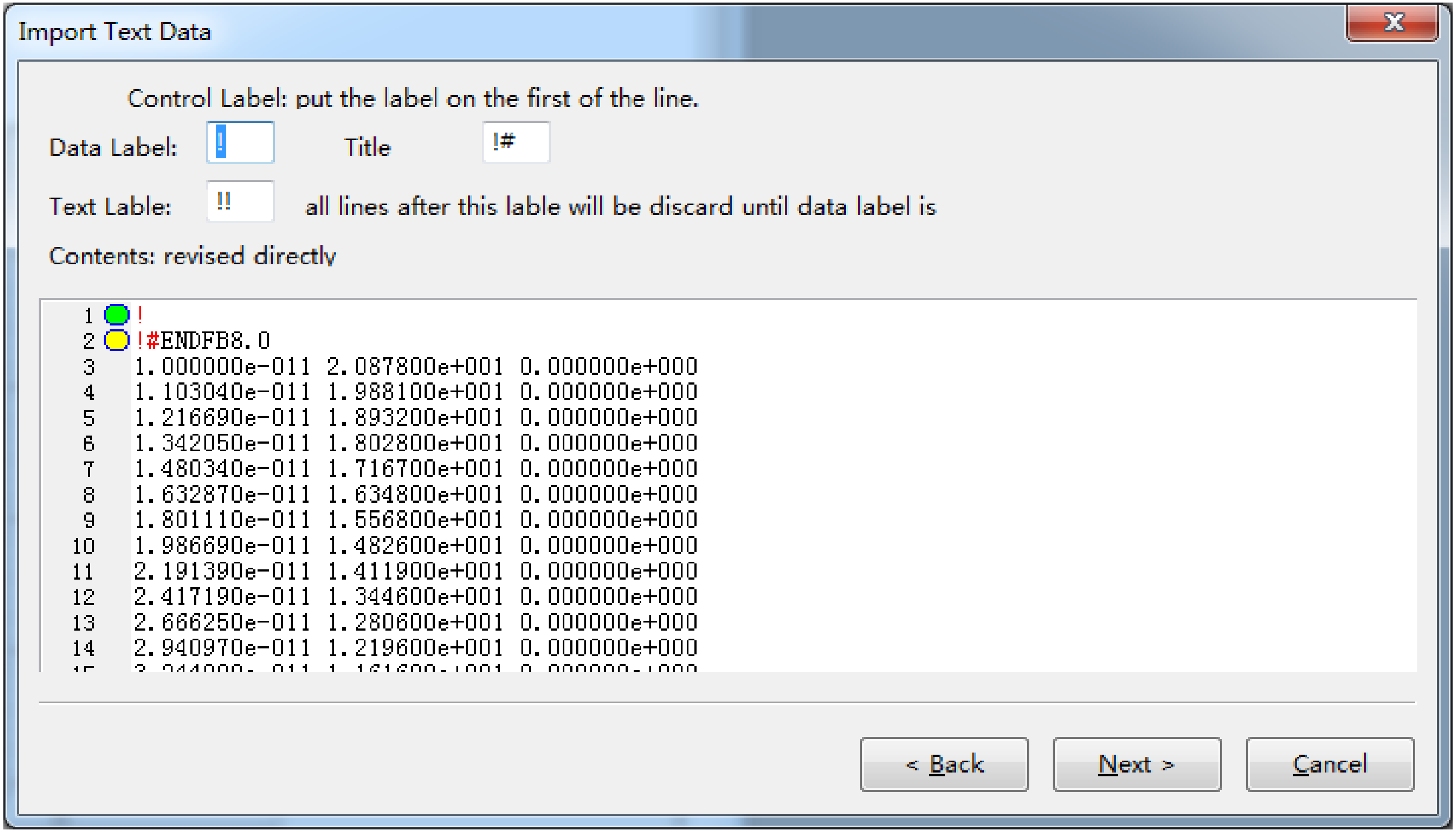

NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
Import Text Data
Connect to Evaluated Lib Alt+E
Evaluated Lib Tree
Ratio of Evaluated Data
Ratio of Evaluated Data with Deferent Lib
Connect to EXFOR Lib Alt+X
Open Exp File(NDPlot Format)
Open Eva file(NDPlot Format)
Open ENDF/B-6 File
Manipulating Data Alt+D
Chain Yield(Evaluated)
Yield Energy Dependence(Evaluated)
Cross Sectio
0.6
0.4

Introduction of NDPlot

Data->Import Text Data：free format data

Data->Connect to Evaluated Lib: Retrieve data from Eva. Lib（Alt+E）
Data->Evaluated Lib Tree: Show the Eva. Lib information in tree form.
Data->Ratio of Eva. Data: Ratio of Cross Section(same lib)
Data->Ratio of Eva. Data with diff. lib:
Ratio of Cross Section(same lib)
Data->Connect to EXFOR Lib (Alt+X)
Data-> Open Exp. Data (NDPlot format)
Data-> Open Eva. Data (NDPlot format)
Data->Manipulating Data （Alt+D）: Chang the size, color, annotation …of point or curve ; View data ,original data..; Column Operation for data;
Data->Chain Yield: Chain Yield of Fission Product
Data->Yield Energy Independence: Yield Energy Independence of Fission Product

[Data Menu->Import Text Data]


Import Text Data

Control Label: put the label on the first of the line.

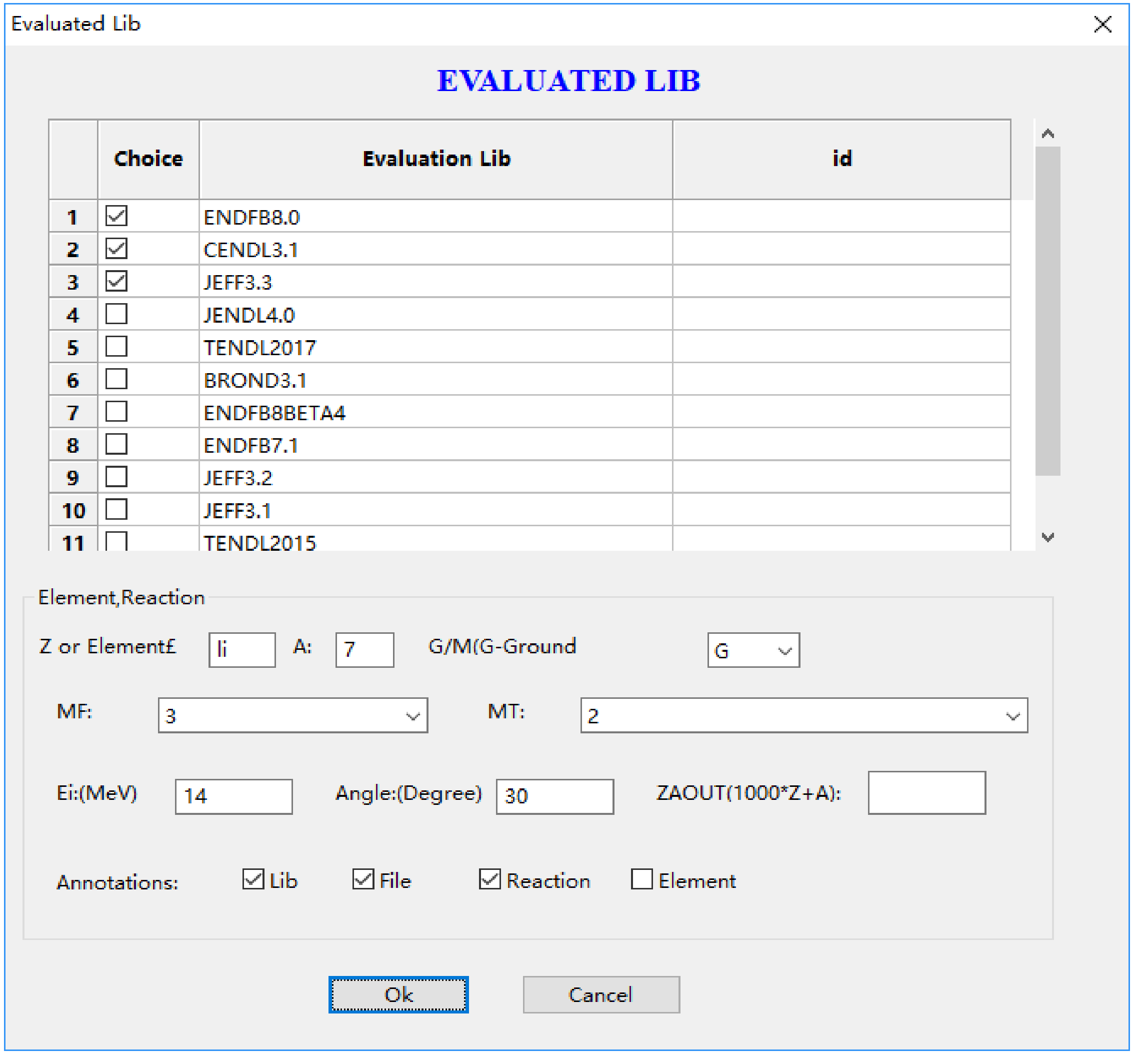
Data Label: !   Title !#

Text Lable: !!   all lines after this lable will be discard until data label is

Contents: revised directly

```
!
!#ENDFB8.0
1.000000e-011 2.087800e+001 0.000000e+000
1.103040e-011 1.988100e+001 0.000000e+000
1.216690e-011 1.893200e+001 0.000000e+000
1.342050e-011 1.802800e+001 0.000000e+000
1.480340e-011 1.716700e+001 0.000000e+000
1.632870e-011 1.634800e+001 0.000000e+000
1.801110e-011 1.556800e+001 0.000000e+000
1.986690e-011 1.482600e+001 0.000000e+000
2.191390e-011 1.411900e+001 0.000000e+000
2.417190e-011 1.344600e+001 0.000000e+000
2.666250e-011 1.280600e+001 0.000000e+000
2.940970e-011 1.219600e+001 0.000000e+000
```

[Data Menu-> Connect to Evaluated Lib]


Evaluated Lib
EVALUATED LIB

	Choice	Evaluation Lib	id
1	☑	ENDFB8.0	
2	☑	CENDL3.1	
3	☑	JEFF3.3	
4	☐	JENDL4.0	
5	☐	TENDL2017	
6	☐	BROND3.1	
7	☐	ENDFB8BETA4	
8	☐	ENDFB7.1	
9	☐	JEFF3.2	
10	☐	JEFF3.1	
11	☐	TENDL2015	

Element,Reaction

Z or Element£ li A: 7 G/M(G-Ground G

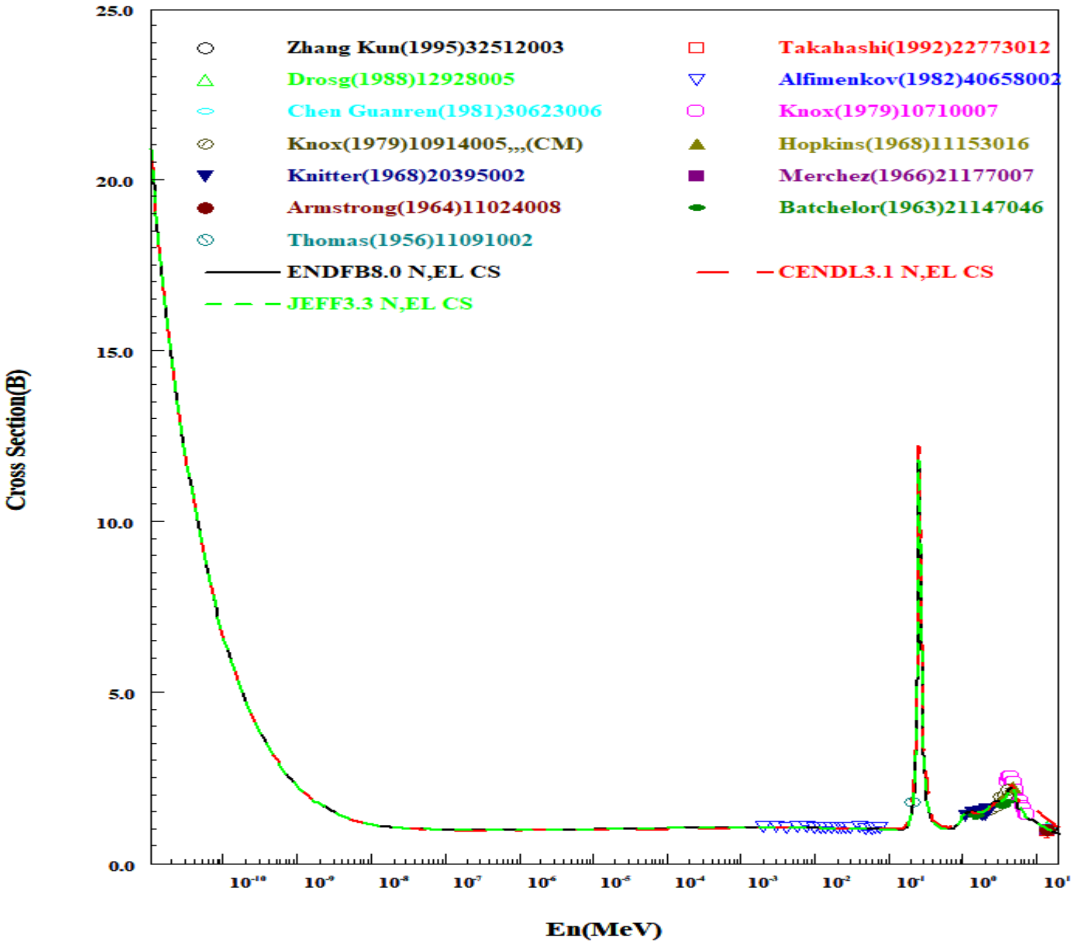
MF: 3 MT: 2

Ei:(MeV) 14 Angle:(Degree) 30 ZAOUT(1000*Z+A):

Annotations: ☑ Lib ☑ File ☑ Reaction ☐ Element

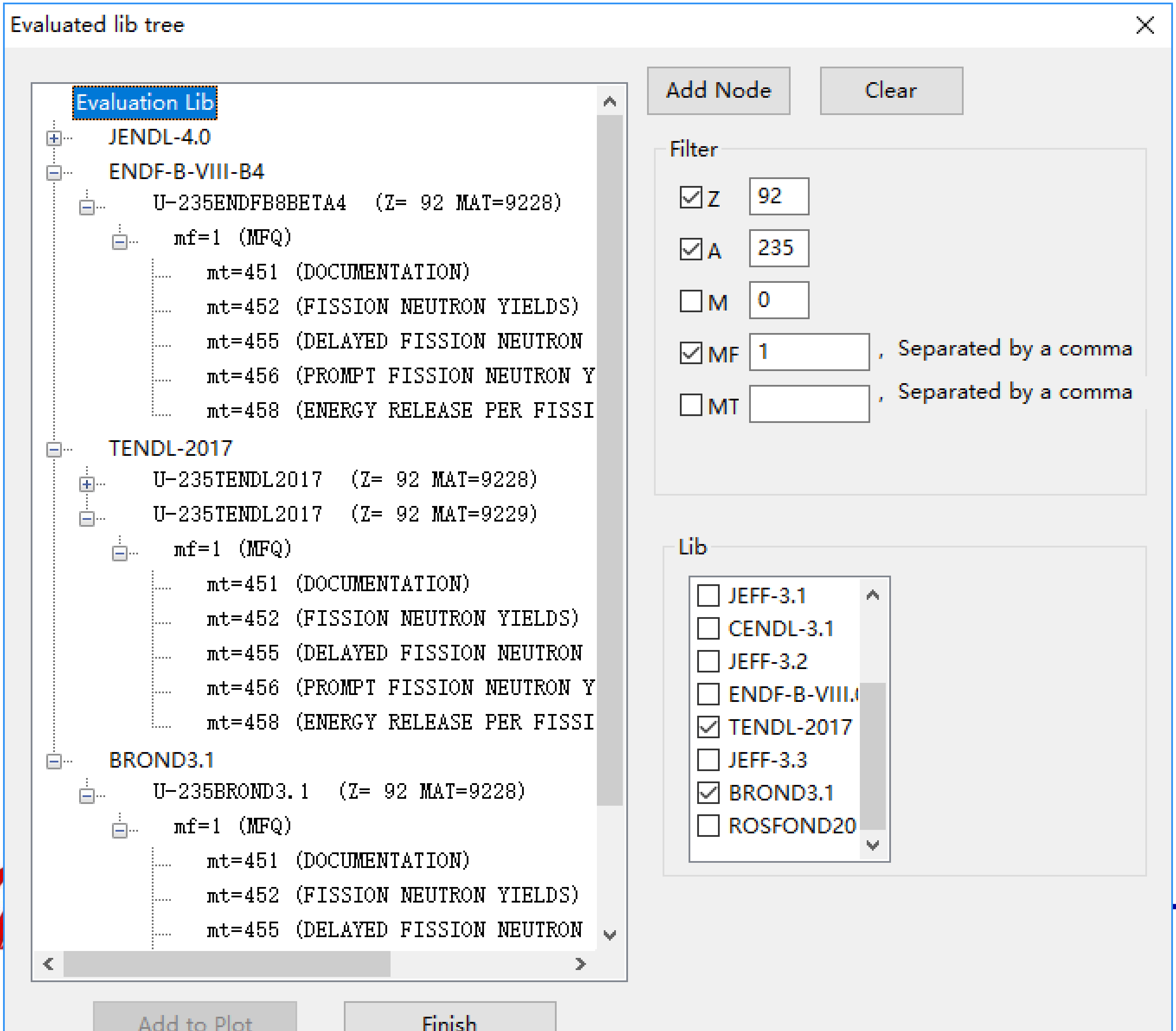
Ok
Cancel

[Data Menu-> Connect to Evaluated Lib]



Adding Exp. Data

[Data Menu-> Evaluated Lib Tree]



Evaluated lib tree

```
Evaluation Lib
  JENDL-4.0
  ENDF-B-VIII-B4
    U-235ENDFB8BETA4  (Z= 92 MAT=9228)
      mf=1 (MFQ)
        mt=451 (DOCUMENTATION)
        mt=452 (FISSION NEUTRON YIELDS)
        mt=455 (DELAYED FISSION NEUTRON
        mt=456 (PROMPT FISSION NEUTRON Y
        mt=458 (ENERGY RELEASE PER FISSI
  TENDL-2017
    U-235TENDL2017  (Z= 92 MAT=9228)
    U-235TENDL2017  (Z= 92 MAT=9229)
      mf=1 (MFQ)
        mt=451 (DOCUMENTATION)
        mt=452 (FISSION NEUTRON YIELDS)
        mt=455 (DELAYED FISSION NEUTRON
        mt=456 (PROMPT FISSION NEUTRON Y
        mt=458 (ENERGY RELEASE PER FISSI
  BROND3.1
    U-235BROND3.1  (Z= 92 MAT=9228)
      mf=1 (MFQ)
        mt=451 (DOCUMENTATION)
        mt=452 (FISSION NEUTRON YIELDS)
        mt=455 (DELAYED FISSION NEUTRON
```

Filter

☑ Z: 92

☑ A: 235

☐ M: 0

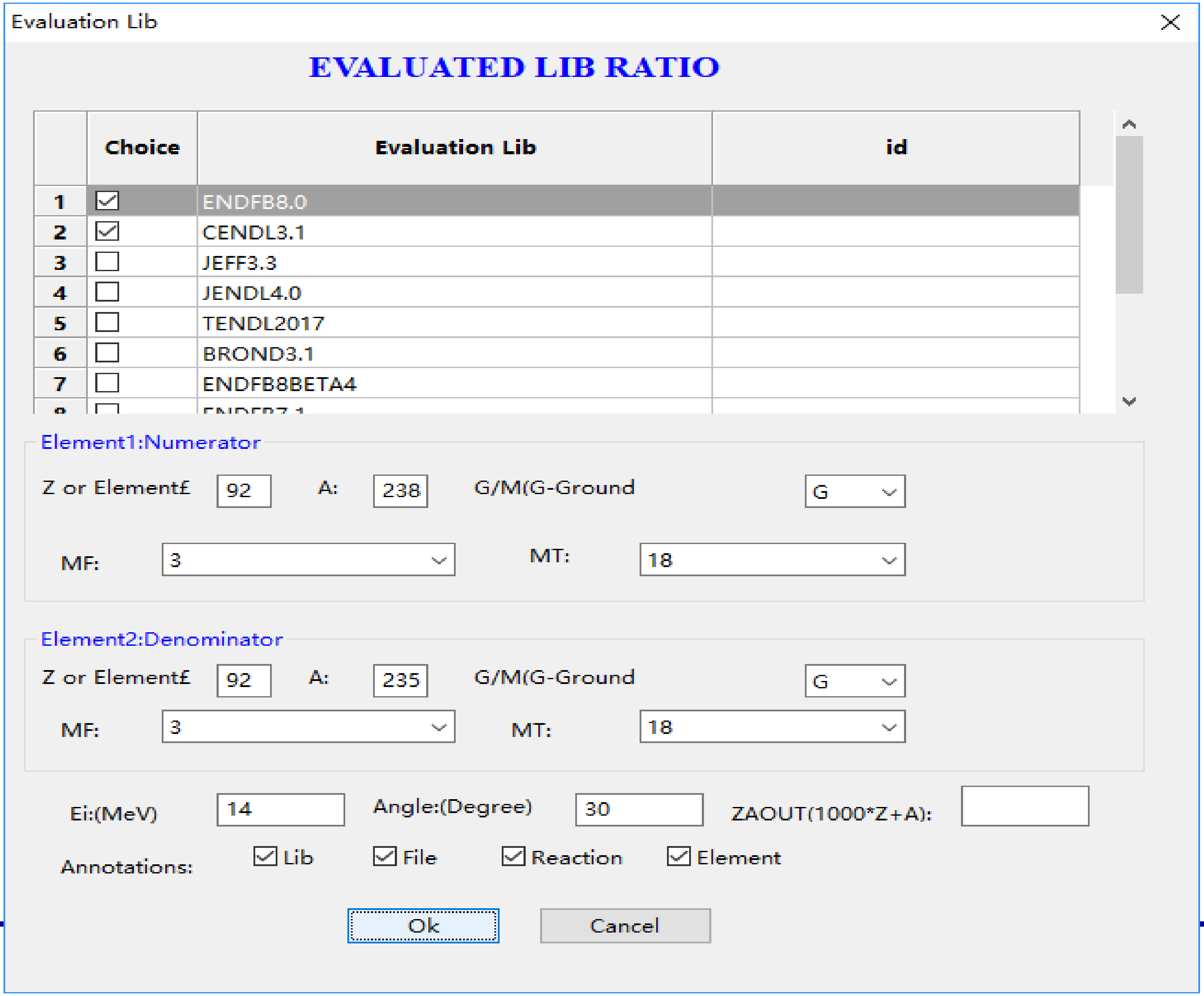
☑ MF: 1 , Separated by a comma

☐ MT: , Separated by a comma

Lib

☐ JEFF-3.1
☐ CENDL-3.1
☐ JEFF-3.2
☐ ENDF-B-VIII.
☑ TENDL-2017
☐ JEFF-3.3
☑ BROND3.1
☐ ROSFOND20

[Data Menu-> Ratio of Eva. Data



Evaluation Lib

EVALUATED LIB RATIO

	Choice	Evaluation Lib	id
1	☑	ENDFB8.0	
2	☑	CENDL3.1	
3	☐	JEFF3.3	
4	☐	JENDL4.0	
5	☐	TENDL2017	
6	☐	BROND3.1	
7	☐	ENDFB8BETA4	

Element1:Numerator

Z or Element£: 92
A: 238
G/M(G-Ground: G
MF: 3
MT: 18

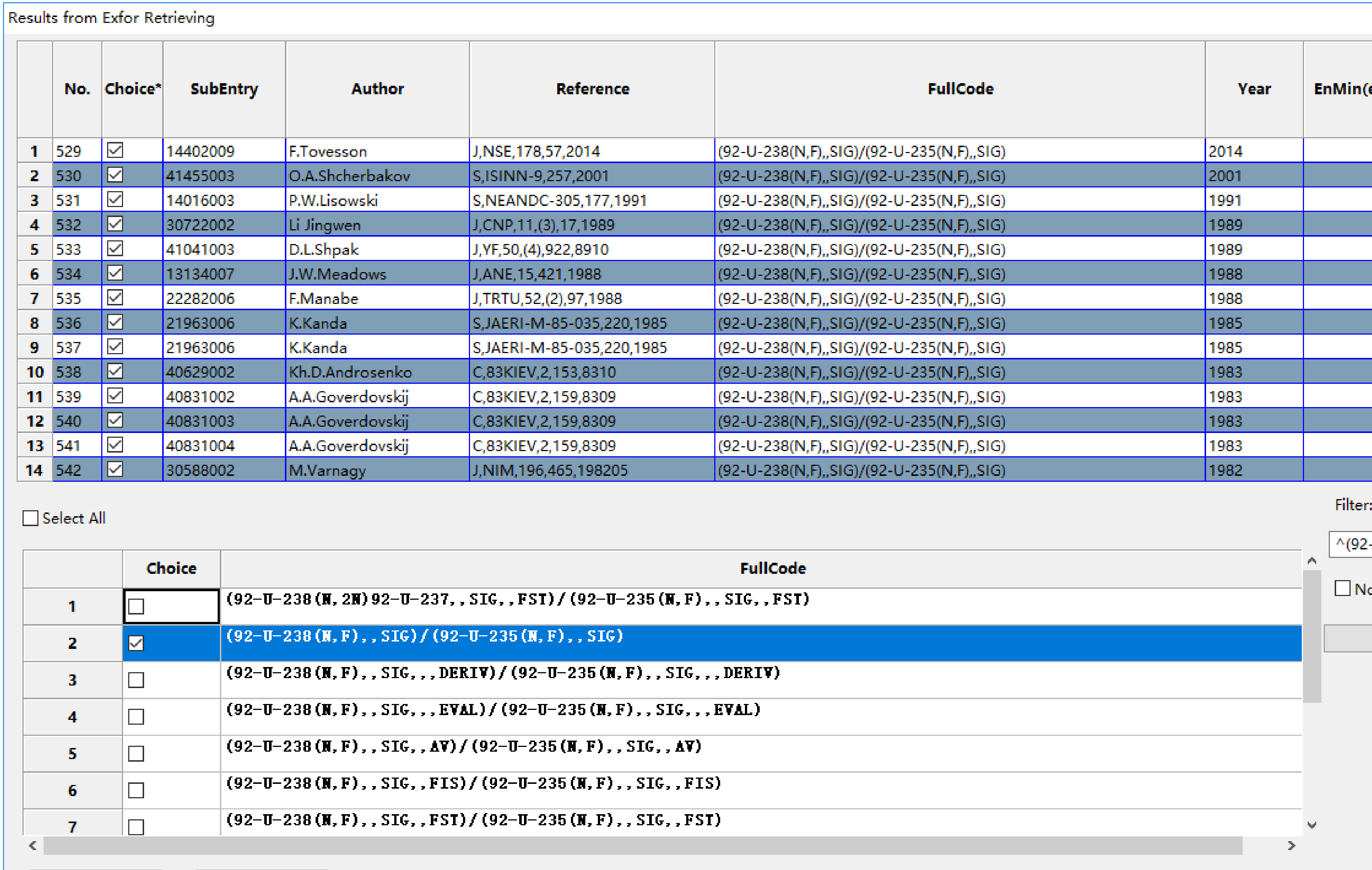
Element2:Denominator

Z or Element£: 92
A: 235
G/M(G-Ground: G
MF: 3
MT: 18

Ei:(MeV): 14
Angle:(Degree): 30
ZAOUT(1000*Z+A):

Annotations: ☑ Lib ☑ File ☑ Reaction ☑ Element

[Data Menu-> Ratio of Eva. Data]



Results from Exfor Retrieving

	No.	Choice*	SubEntry	Author	Reference	FullCode	Year	EnMin(
1	529	☑	14402009	F.Tovesson	J,NSE,178,57,2014	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	2014	
2	530	☑	41455003	O.A.Shcherbakov	S,ISINN-9,257,2001	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	2001	
3	531	☑	14016003	P.W.Lisowski	S,NEANDC-305,177,1991	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1991	
4	532	☑	30722002	Li Jingwen	J,CNP,11,(3),17,1989	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1989	
5	533	☑	41041003	D.L.Shpak	J,YF,50,(4),922,8910	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1989	
6	534	☑	13134007	J.W.Meadows	J,ANE,15,421,1988	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1988	
7	535	☑	22282006	F.Manabe	J,TRTU,52,(2),97,1988	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1988	
8	536	☑	21963006	K.Kanda	S,JAERI-M-85-035,220,1985	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1985	
9	537	☑	21963006	K.Kanda	S,JAERI-M-85-035,220,1985	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1985	
10	538	☑	40629002	Kh.D.Androsenko	C,83KIEV,2,153,8310	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1983	
11	539	☑	40831002	A.A.Goverdovskij	C,83KIEV,2,159,8309	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1983	
12	540	☑	40831003	A.A.Goverdovskij	C,83KIEV,2,159,8309	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1983	
13	541	☑	40831004	A.A.Goverdovskij	C,83KIEV,2,159,8309	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1983	
14	542	☑	30588002	M.Varnagy	J,NIM,196,465,198205	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)	1982	

☐ Select All

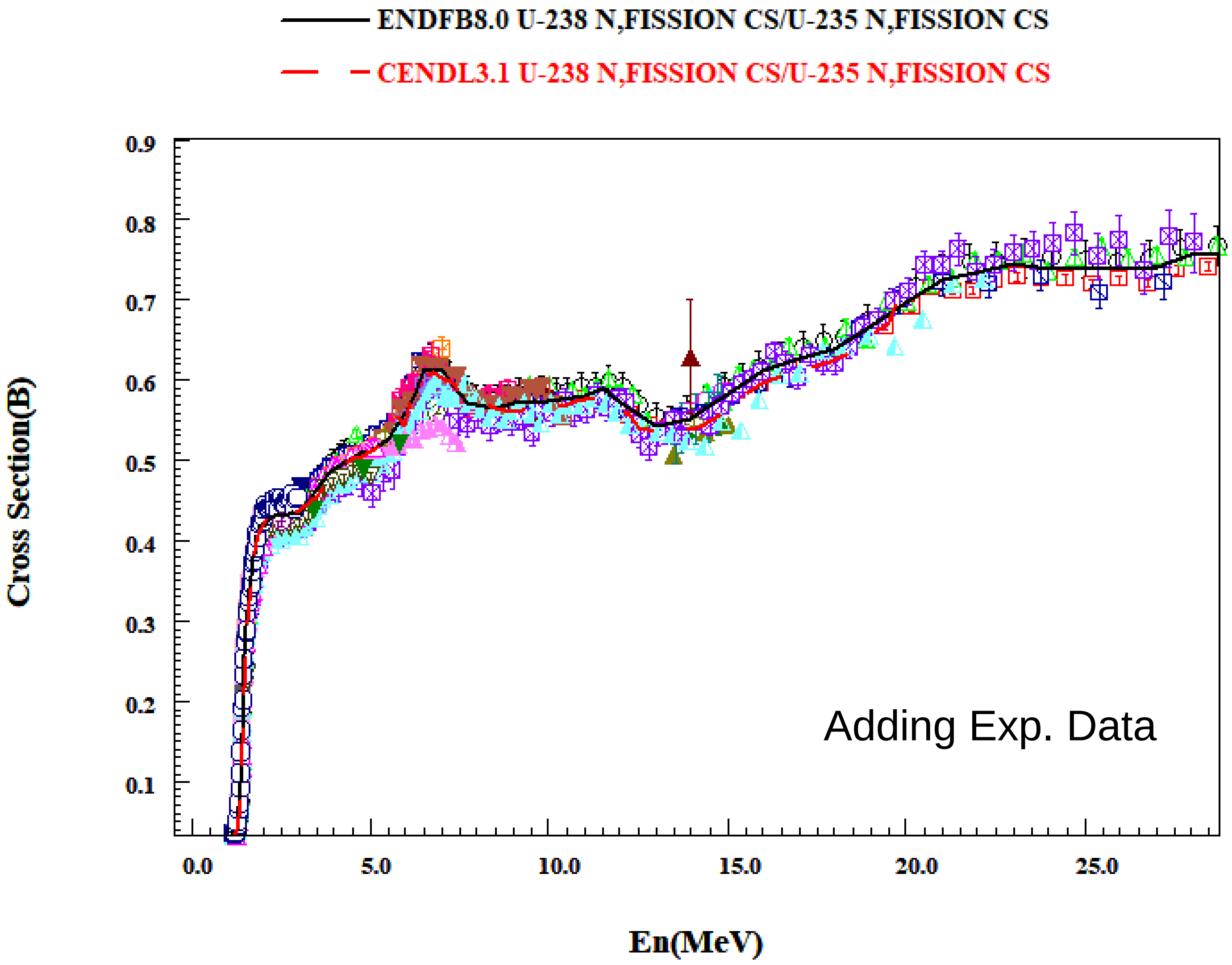
Filter:

^(92-

☐ Nc

	Choice	FullCode
1	☐	(92-U-238(N,2N)92-U-237,,SIG,,FST)/(92-U-235(N,F),,SIG,,FST)
2	☑	(92-U-238(N,F),,SIG)/(92-U-235(N,F),,SIG)
3	☐	(92-U-238(N,F),,SIG,,,DERIV)/(92-U-235(N,F),,SIG,,,DERIV)
4	☐	(92-U-238(N,F),,SIG,,,EVAL)/(92-U-235(N,F),,SIG,,,EVAL)
5	☐	(92-U-238(N,F),,SIG,,AV)/(92-U-235(N,F),,SIG,,AV)
6	☐	(92-U-238(N,F),,SIG,,FIS)/(92-U-235(N,F),,SIG,,FIS)
7	☐	(92-U-238(N,F),,SIG,,FST)/(92-U-235(N,F),,SIG,,FST)

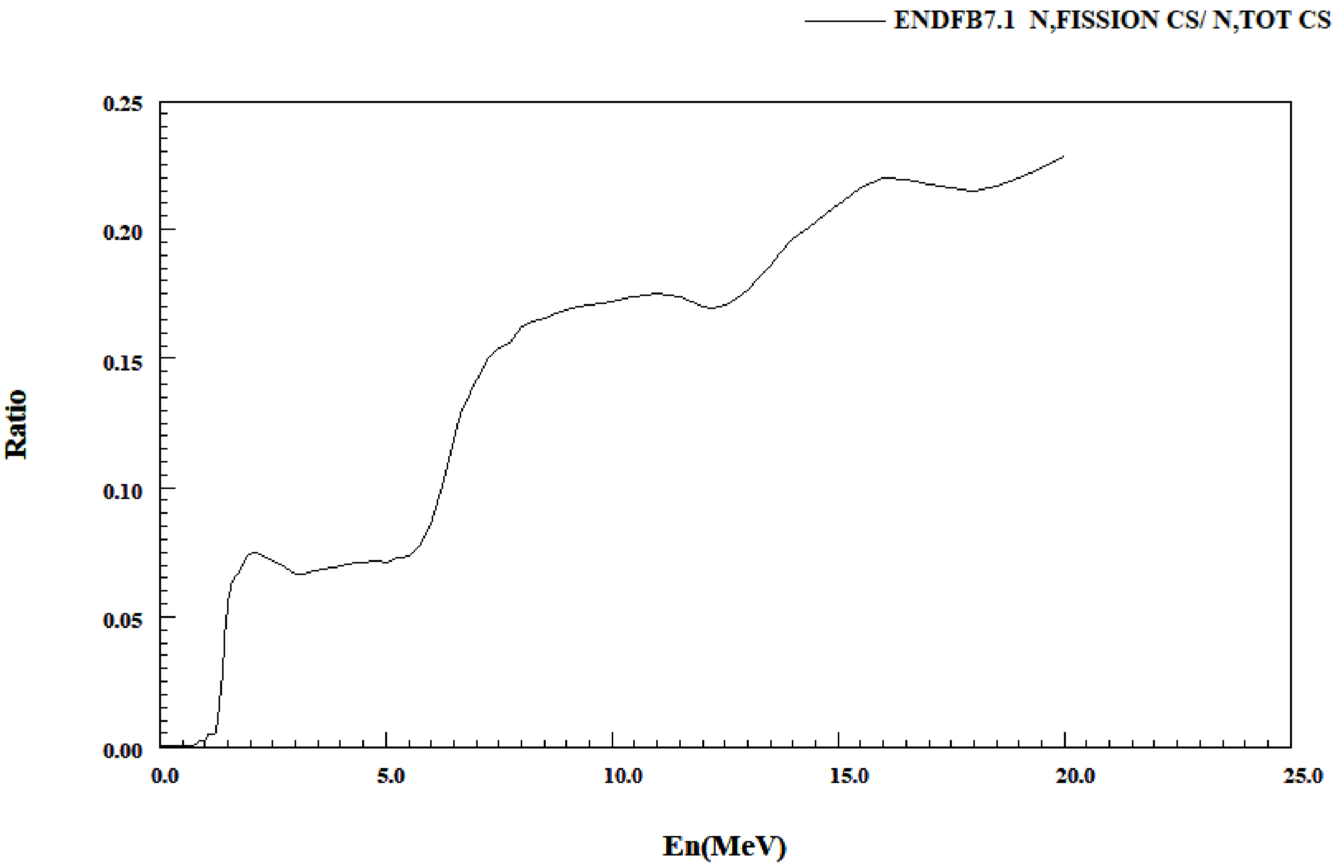
[Data Menu-> Ratio of Eva. Data]



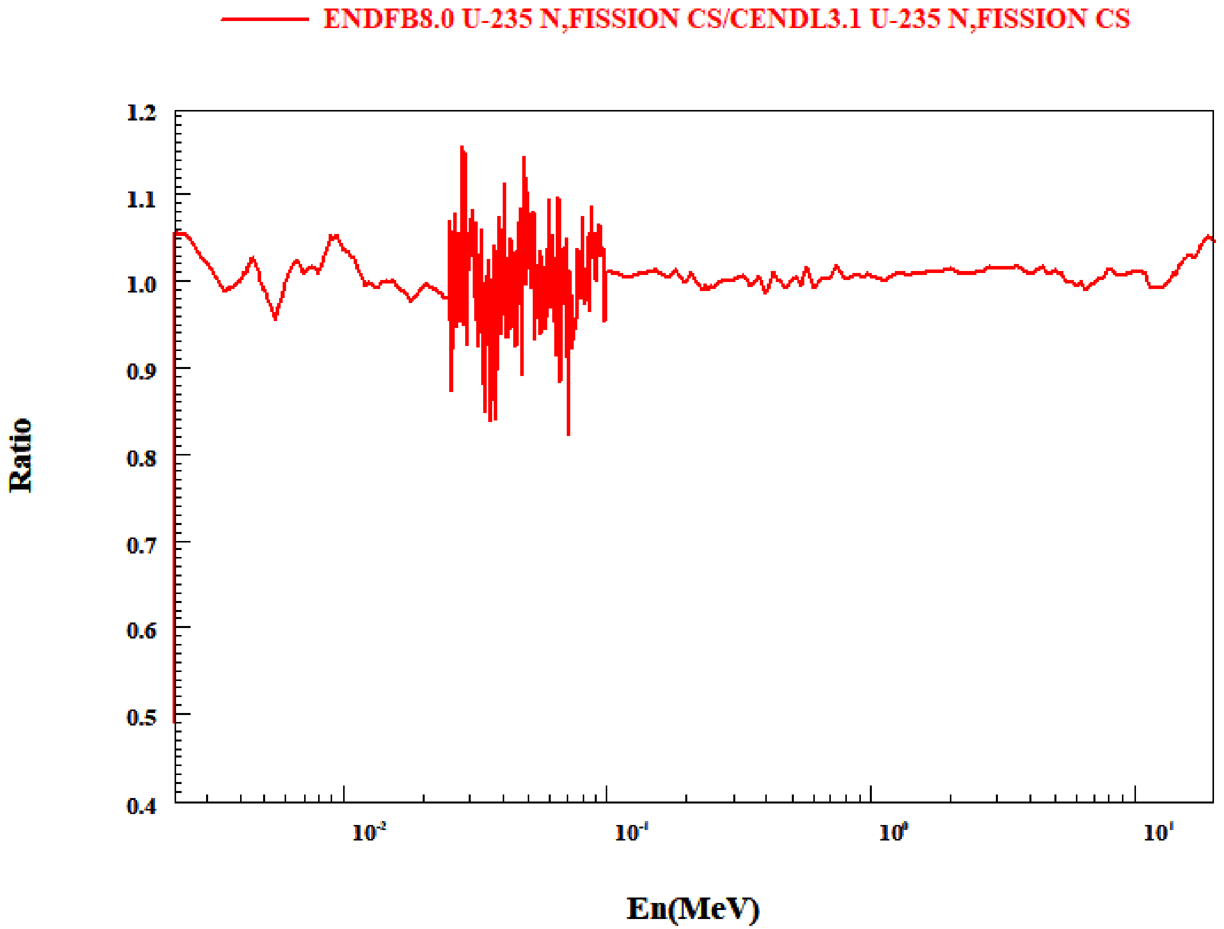
Adding Exp. Data

[Data Menu-> Ratio of Eva. Data]

ENDFB7.1 N,FISSION CS/ N,TOT CS

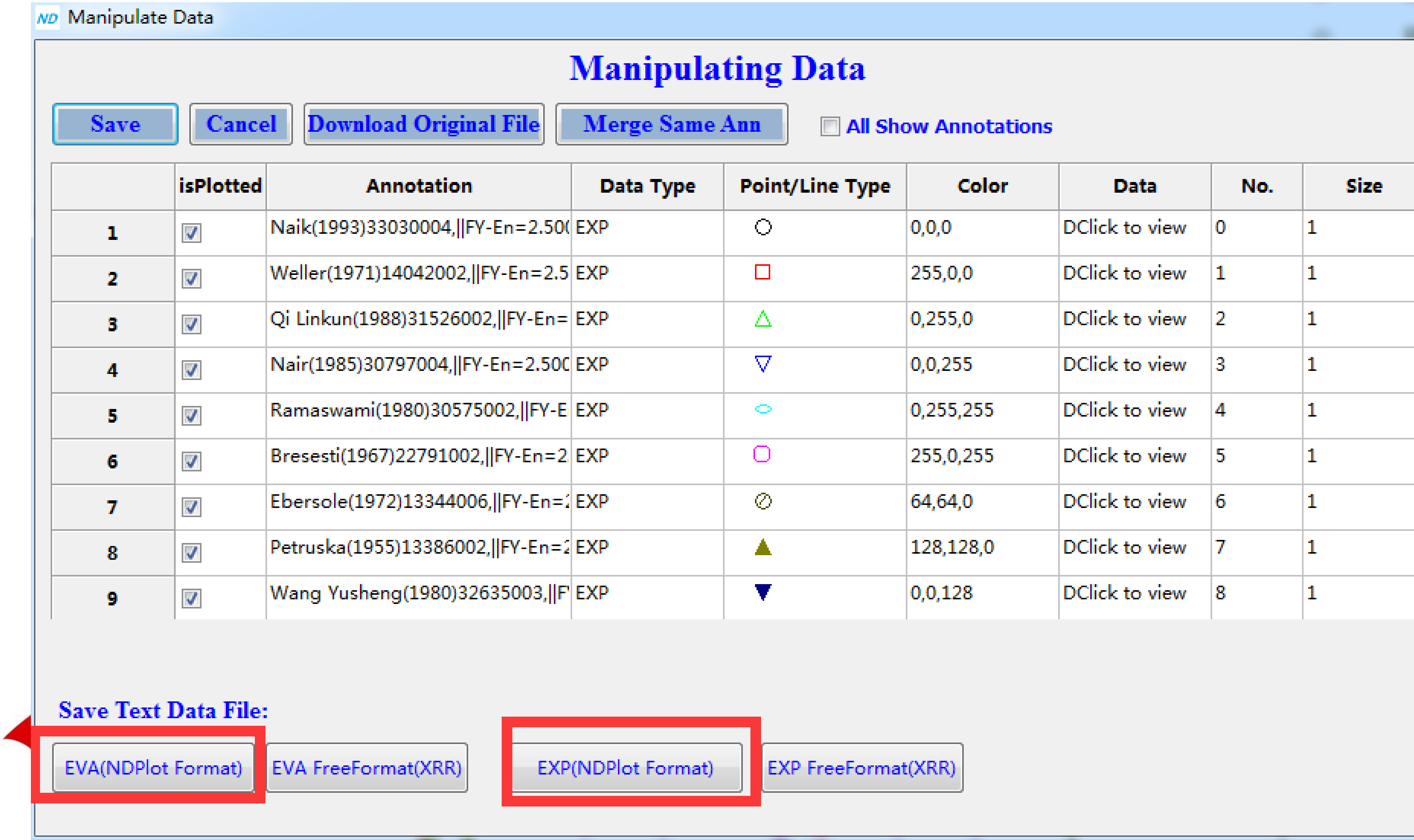


[Data Menu-> Ratio of Eva. Data With Different Lib]



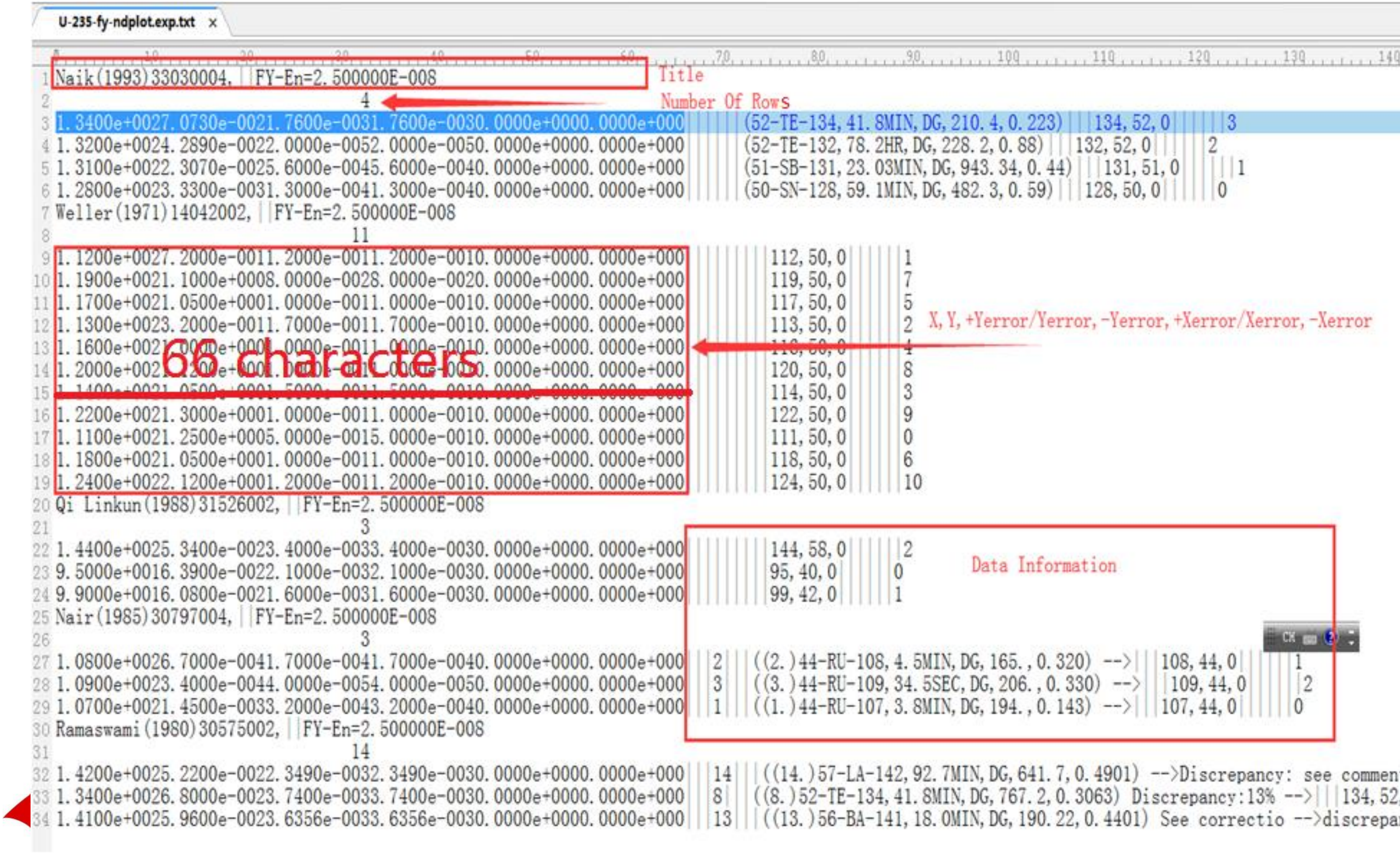
[Data Menu->Open EXP(EVA) File(Ndplot format)]

The Data is outputted by Manipulating data Window


Manipulate Data
Manipulating Data
Save
Cancel
Download Original File
Merge Same Ann
☐ All Show Annotations
Save Text Data File:
EVA(NDPlot Format)
EVA FreeFormat(XRR)
EXP(NDPlot Format)
EXP FreeFormat(XRR)

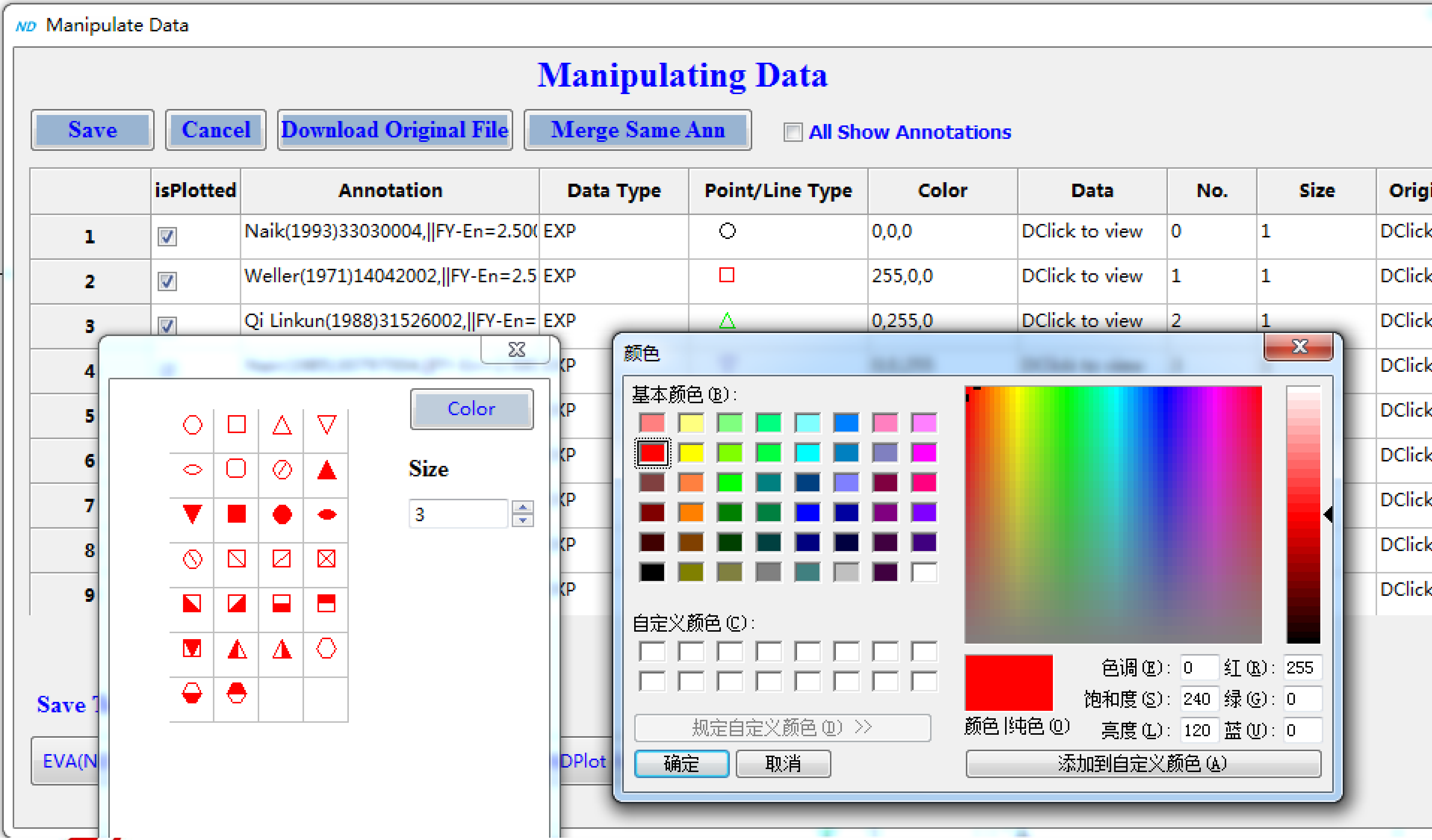
	isPlotted	Annotation	Data Type	Point/Line Type	Color	Data	No.	Size
1	☑	Naik(1993)33030004,||FY-En=2.50	EXP	○	0,0,0	DClick to view	0	1
2	☑	Weller(1971)14042002,||FY-En=2.5	EXP	□	255,0,0	DClick to view	1	1
3	☑	Qi Linkun(1988)31526002,||FY-En=	EXP	△	0,255,0	DClick to view	2	1
4	☑	Nair(1985)30797004,||FY-En=2.50	EXP	▽	0,0,255	DClick to view	3	1
5	☑	Ramaswami(1980)30575002,||FY-E	EXP	⬭	0,255,255	DClick to view	4	1
6	☑	Bresesti(1967)22791002,||FY-En=2	EXP	▢	255,0,255	DClick to view	5	1
7	☑	Ebersole(1972)13344006,||FY-En=	EXP	⊘	64,64,0	DClick to view	6	1
8	☑	Petruska(1955)13386002,||FY-En=	EXP	▲	128,128,0	DClick to view	7	1
9	☑	Wang Yusheng(1980)32635003,||F	EXP	▼	0,0,128	DClick to view	8	1

NDPlot Text Data Format



```
Naik(1993)33030004,   FY-En=2.500000E-008
                            4
1.3400e+0027.0730e-0021.7600e-0031.7600e-0030.0000e+0000.0000e+000          (52-TE-134,41.8MIN,DG,210.4,0.223)   134,52,0        3
1.3200e+0024.2890e-0022.0000e-0052.0000e-0050.0000e+0000.0000e+000          (52-TE-132,78.2HR,DG,228.2,0.88)   132,52,0      2
1.3100e+0022.3070e-0025.6000e-0045.6000e-0040.0000e+0000.0000e+000          (51-SB-131,23.03MIN,DG,943.34,0.44)   131,51,0      1
1.2800e+0023.3300e-0031.3000e-0041.3000e-0040.0000e+0000.0000e+000          (50-SN-128,59.1MIN,DG,482.3,0.59)   128,50,0      0
Weller(1971)14042002,   FY-En=2.500000E-008
                            11
1.1200e+0027.2000e-0011.2000e-0011.2000e-0010.0000e+0000.0000e+000          112,50,0        1
1.1900e+0021.1000e+0008.0000e-0028.0000e-0020.0000e+0000.0000e+000          119,50,0        7
1.1700e+0021.0500e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          117,50,0        5
1.1300e+0023.2000e-0011.7000e-0011.7000e-0010.0000e+0000.0000e+000          113,50,0        2
1.1600e+0021.[illegible]e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          116,50,0        4
1.2000e+0021.1200e+0001.[illegible]0.0000e+0000.0000e+000          120,50,0        8
1.1400e+0021.0500e+0001.5000e-0011.5000e-0010.0000e+0000.0000e+000          114,50,0        3
1.2200e+0021.3000e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          122,50,0        9
1.1100e+0021.2500e+0005.0000e-0015.0000e-0010.0000e+0000.0000e+000          111,50,0        0
1.1800e+0021.0500e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          118,50,0        6
1.2400e+0022.1200e+0001.2000e-0011.2000e-0010.0000e+0000.0000e+000          124,50,0        10
Qi Linkun(1988)31526002,   FY-En=2.500000E-008
                            3
1.4400e+0025.3400e-0023.4000e-0033.4000e-0030.0000e+0000.0000e+000          144,58,0        2
9.5000e+0016.3900e-0022.1000e-0032.1000e-0030.0000e+0000.0000e+000          95,40,0        0
9.9000e+0016.0800e-0021.6000e-0031.6000e-0030.0000e+0000.0000e+000          99,42,0        1
Nair(1985)30797004,   FY-En=2.500000E-008
                            3
1.0800e+0026.7000e-0041.7000e-0041.7000e-0040.0000e+0000.0000e+000   2   ((2.)44-RU-108,4.5MIN,DG,165.,0.320) -->   108,44,0        1
1.0900e+0023.4000e-0044.0000e-0054.0000e-0050.0000e+0000.0000e+000   3   ((3.)44-RU-109,34.5SEC,DG,206.,0.330) -->   109,44,0        2
1.0700e+0021.4500e-0033.2000e-0043.2000e-0040.0000e+0000.0000e+000   1   ((1.)44-RU-107,3.8MIN,DG,194.,0.143) -->   107,44,0        0
Ramaswami(1980)30575002,   FY-En=2.500000E-008
                            14
1.4200e+0025.2200e-0022.3490e-0032.3490e-0030.0000e+0000.0000e+000   14   ((14.)57-LA-142,92.7MIN,DG,641.7,0.4901) -->Discrepancy: see commen
1.3400e+0026.8000e-0023.7400e-0033.7400e-0030.0000e+0000.0000e+000   8   ((8.)52-TE-134,41.8MIN,DG,767.2,0.3063) Discrepancy:13% -->   134,52
1.4100e+0025.9600e-0023.6356e-0033.6356e-0030.0000e+0000.0000e+000   13   ((13.)56-BA-141,18.0MIN,DG,190.22,0.4401) See correctio -->discrepa
```

[Data Menu->Manipulating Data]

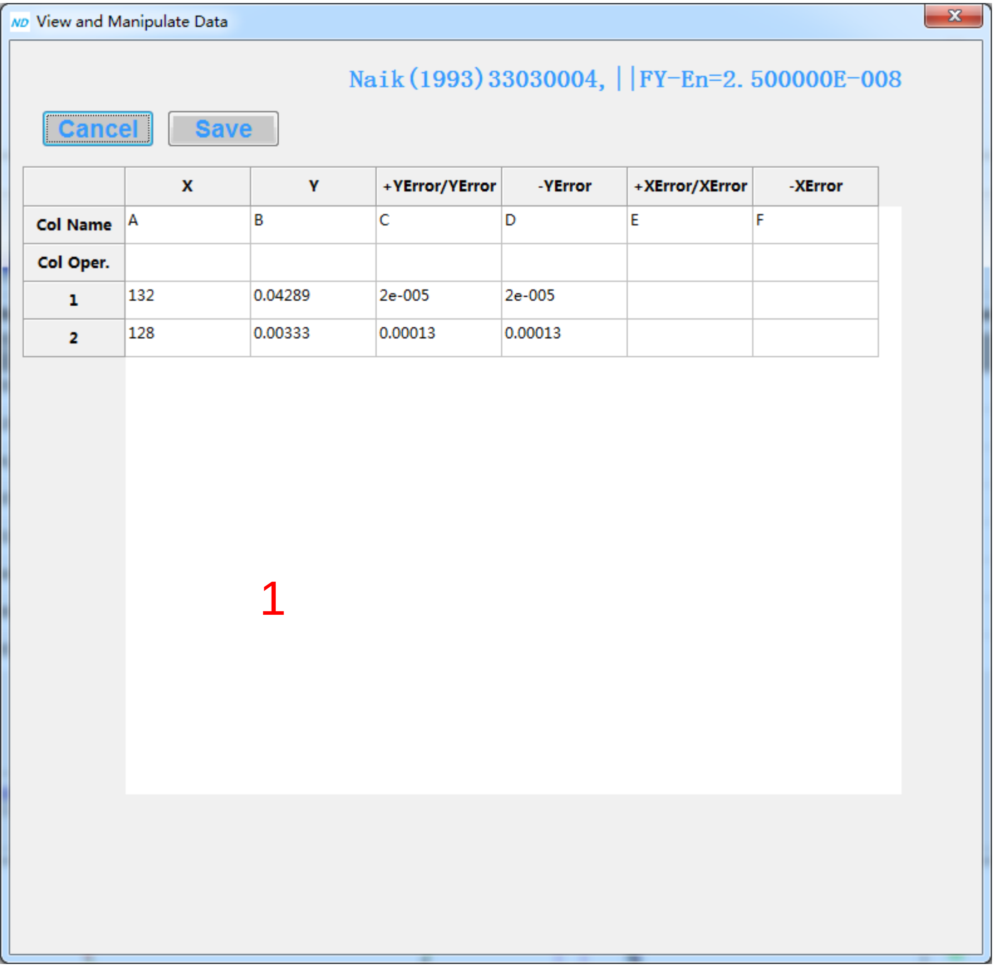

ND Manipulate Data
Manipulating Data
Save
Cancel
Download Original File
Merge Same Ann
☐ All Show Annotations
Color
Size
颜色
基本颜色(B):
自定义颜色(C):
规定自定义颜色(D) >>
确定
取消
颜色|纯色(O)
添加到自定义颜色(A)
Save T
EVA(N
DPlot

	isPlotted	Annotation	Data Type	Point/Line Type	Color	Data	No.	Size	Origi
1	☑	Naik(1993)33030004,||FY-En=2.50(	EXP	○	0,0,0	DClick to view	0	1	DClick
2	☑	Weller(1971)14042002,||FY-En=2.5	EXP	□	255,0,0	DClick to view	1	1	DClick
3	☑	Qi Linkun(1988)31526002,||FY-En=	EXP	△	0,255,0	DClick to view	2	1	DClick
4			XP						DClick
5			XP						DClick
6			XP						DClick
7			XP						DClick
8			XP						DClick
9			XP						DClick

Size: 3

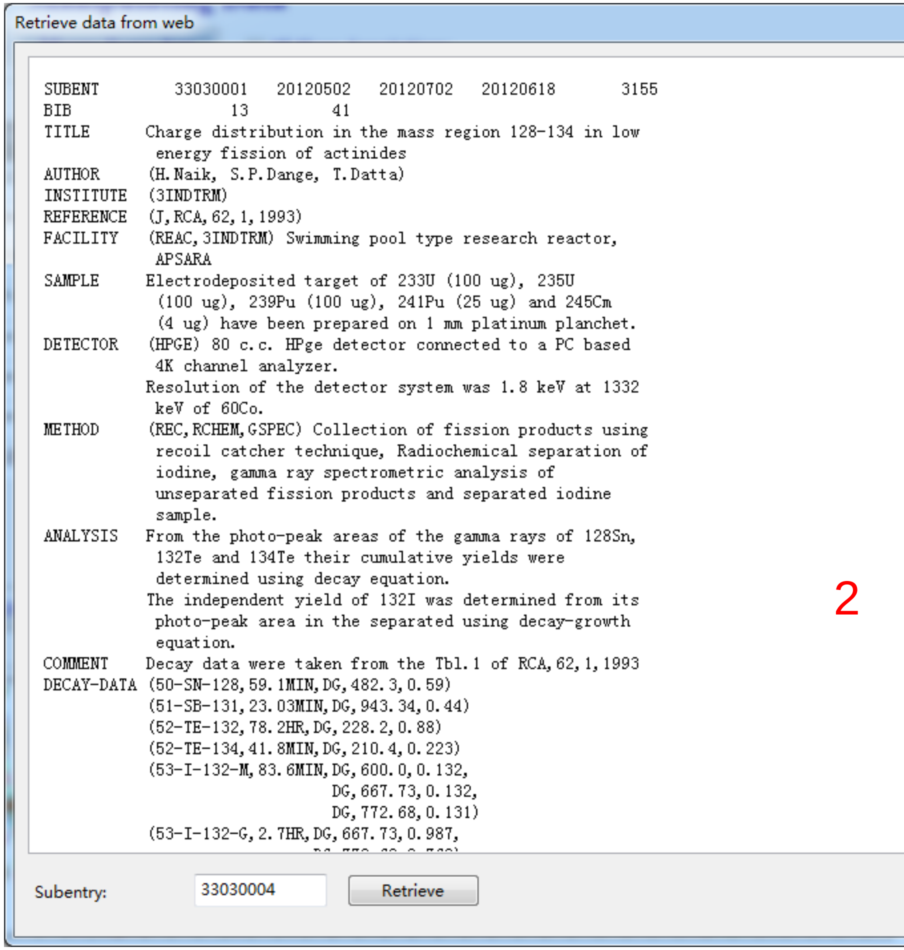
色调(E): 0
红(R): 255
饱和度(S): 240
绿(G): 0
亮度(L): 120
蓝(U): 0

[Data Menu->Manipulating Data]



Naik(1993)33030004, ||FY-En=2.500000E-008

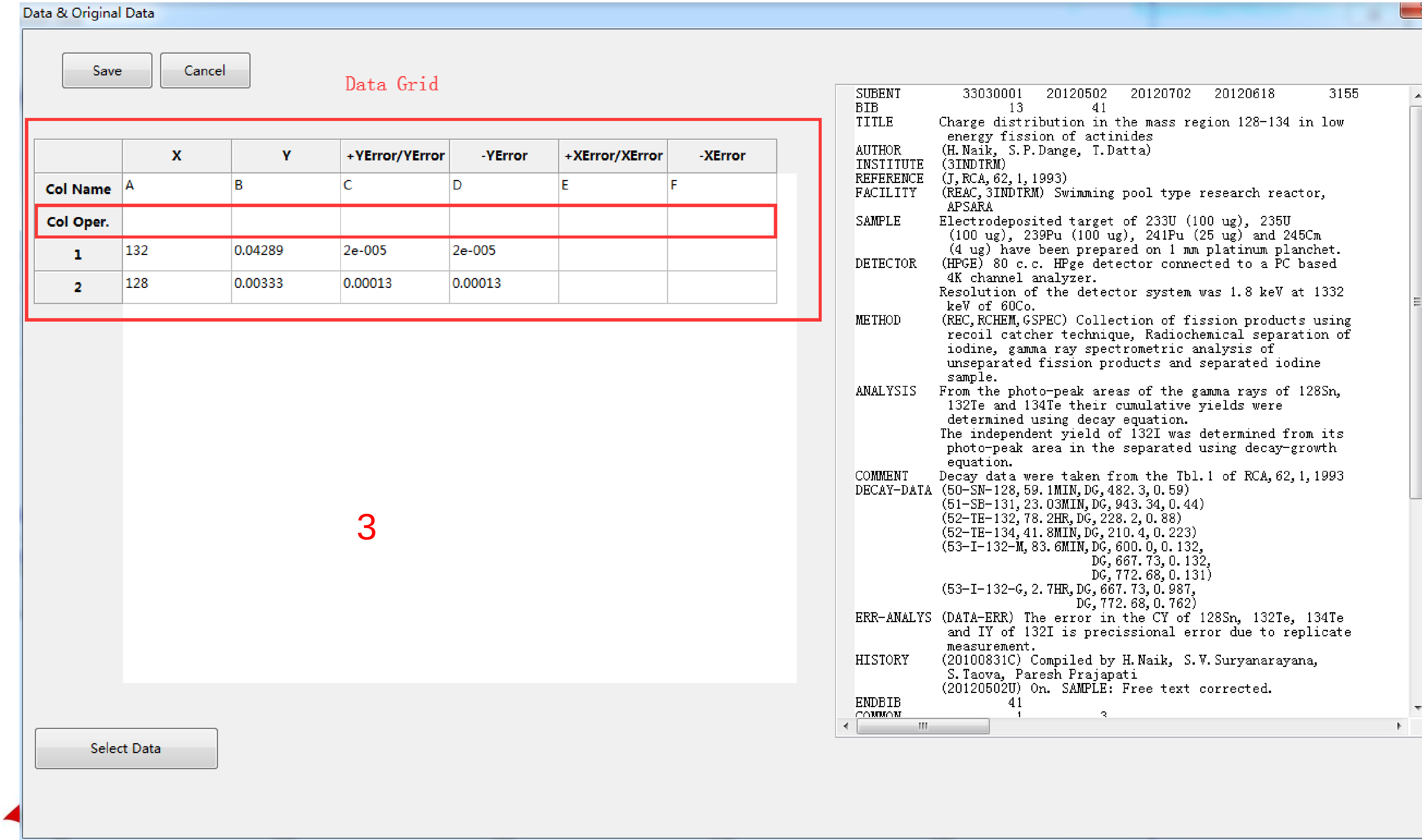
	X	Y	+YError/YError	-YError	+XError/XError	-XError
Col Name	A	B	C	D	E	F
Col Oper.						
1	132	0.04289	2e-005	2e-005		
2	128	0.00333	0.00013	0.00013		



```
SUBENT        33030001   20120502   20120702   20120618       3155
BIB                 13         41
TITLE      Charge distribution in the mass region 128-134 in low
            energy fission of actinides
AUTHOR     (H.Naik, S.P.Dange, T.Datta)
INSTITUTE  (3INDTRM)
REFERENCE  (J,RCA,62,1,1993)
FACILITY   (REAC,3INDTRM) Swimming pool type research reactor,
            APSARA
SAMPLE     Electrodeposited target of 233U (100 ug), 235U
            (100 ug), 239Pu (100 ug), 241Pu (25 ug) and 245Cm
            (4 ug) have been prepared on 1 mm platinum planchet.
DETECTOR   (HPGE) 80 c.c. HPge detector connected to a PC based
            4K channel analyzer.
           Resolution of the detector system was 1.8 keV at 1332
            keV of 60Co.
METHOD     (REC,RCHEM,GSPEC) Collection of fission products using
            recoil catcher technique, Radiochemical separation of
            iodine, gamma ray spectrometric analysis of
            unseparated fission products and separated iodine
            sample.
ANALYSIS   From the photo-peak areas of the gamma rays of 128Sn,
            132Te and 134Te their cumulative yields were
            determined using decay equation.
           The independent yield of 132I was determined from its
            photo-peak area in the separated using decay-growth
            equation.
COMMENT    Decay data were taken from the Tbl.1 of RCA,62,1,1993
DECAY-DATA (50-SN-128,59.1MIN,DG,482.3,0.59)
           (51-SB-131,23.03MIN,DG,943.34,0.44)
           (52-TE-132,78.2HR,DG,228.2,0.88)
           (52-TE-134,41.8MIN,DG,210.4,0.223)
           (53-I-132-M,83.6MIN,DG,600.0,0.132,
                               DG,667.73,0.132,
                               DG,772.68,0.131)
           (53-I-132-G,2.7HR,DG,667.73,0.987,
```

Subentry: 33030004

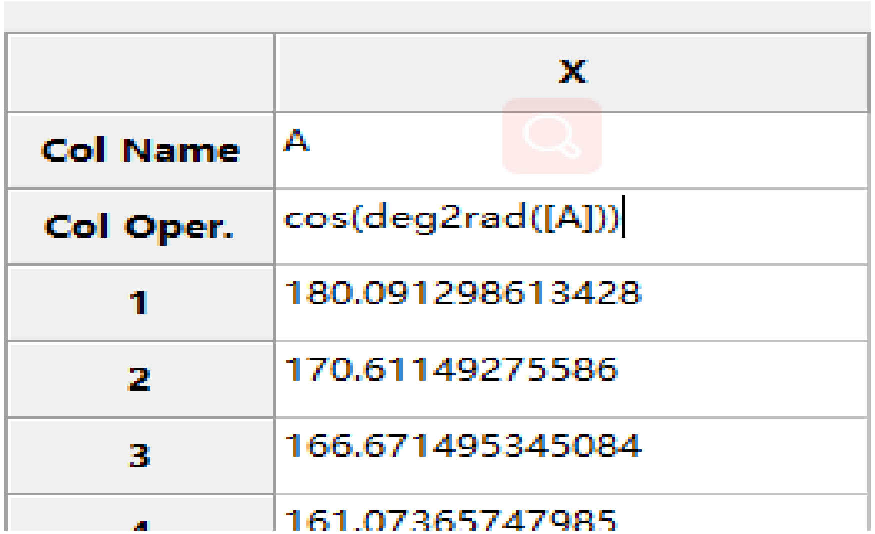
[Data Grid : Support Column Operation]



	X	Y	+YError/YError	-YError	+XError/XError	-XError
Col Name	A	B	C	D	E	F
Col Oper.						
1	132	0.04289	2e-005	2e-005		
2	128	0.00333	0.00013	0.00013		

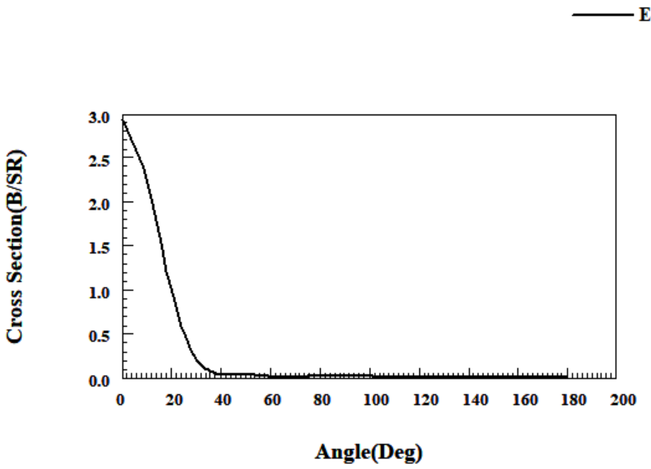
```
SUBENT        33030001   20120502   20120702   20120618        3155
BIB                 13         41
TITLE       Charge distribution in the mass region 128-134 in low
             energy fission of actinides
AUTHOR      (H.Naik, S.P.Dange, T.Datta)
INSTITUTE   (3INDTRM)
REFERENCE   (J,RCA,62,1,1993)
FACILITY    (REAC,3INDTRM) Swimming pool type research reactor,
             APSARA
SAMPLE      Electrodeposited target of 233U (100 ug), 235U
             (100 ug), 239Pu (100 ug), 241Pu (25 ug) and 245Cm
             (4 ug) have been prepared on 1 mm platinum planchet.
DETECTOR    (HPGE) 80 c.c. HPge detector connected to a PC based
             4K channel analyzer.
            Resolution of the detector system was 1.8 keV at 1332
             keV of 60Co.
METHOD      (REC,RCHEM,GSPEC) Collection of fission products using
             recoil catcher technique, Radiochemical separation of
             iodine, gamma ray spectrometric analysis of
             unseparated fission products and separated iodine
             sample.
ANALYSIS    From the photo-peak areas of the gamma rays of 128Sn,
             132Te and 134Te their cumulative yields were
             determined using decay equation.
            The independent yield of 132I was determined from its
             photo-peak area in the separated using decay-growth
             equation.
COMMENT     Decay data were taken from the Tbl.1 of RCA,62,1,1993
DECAY-DATA  (50-SN-128,59.1MIN,DG,482.3,0.59)
            (51-SB-131,23.03MIN,DG,943.34,0.44)
            (52-TE-132,78.2HR,DG,228.2,0.88)
            (52-TE-134,41.8MIN,DG,210.4,0.223)
            (53-I-132-M,83.6MIN,DG,600.0,0.132,
                                 DG,667.73,0.132,
                                 DG,772.68,0.131)
            (53-I-132-G,2.7HR,DG,667.73,0.987,
                               DG,772.68,0.762)
ERR-ANALYS  (DATA-ERR) The error in the CY of 128Sn, 132Te, 134Te
             and IY of 132I is precissional error due to replicate
             measurement.
HISTORY     (20100831C) Compiled by H.Naik, S.V.Suryanarayana,
             S.Taova, Paresh Prajapati
            (20120502U) On. SAMPLE: Free text corrected.
ENDBIB              41
COMMON               1          3
```

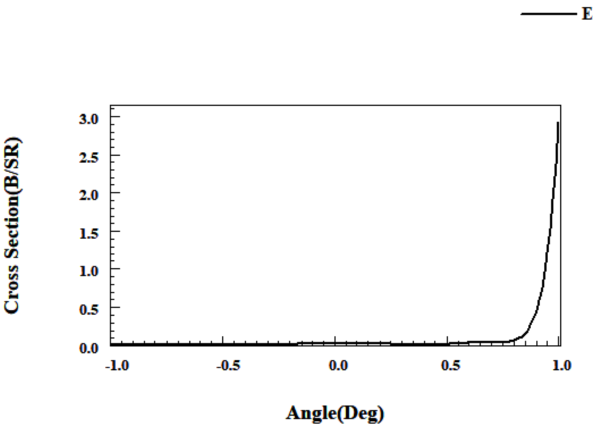
Column Operation :Degree -》 Radian -》 Cosine



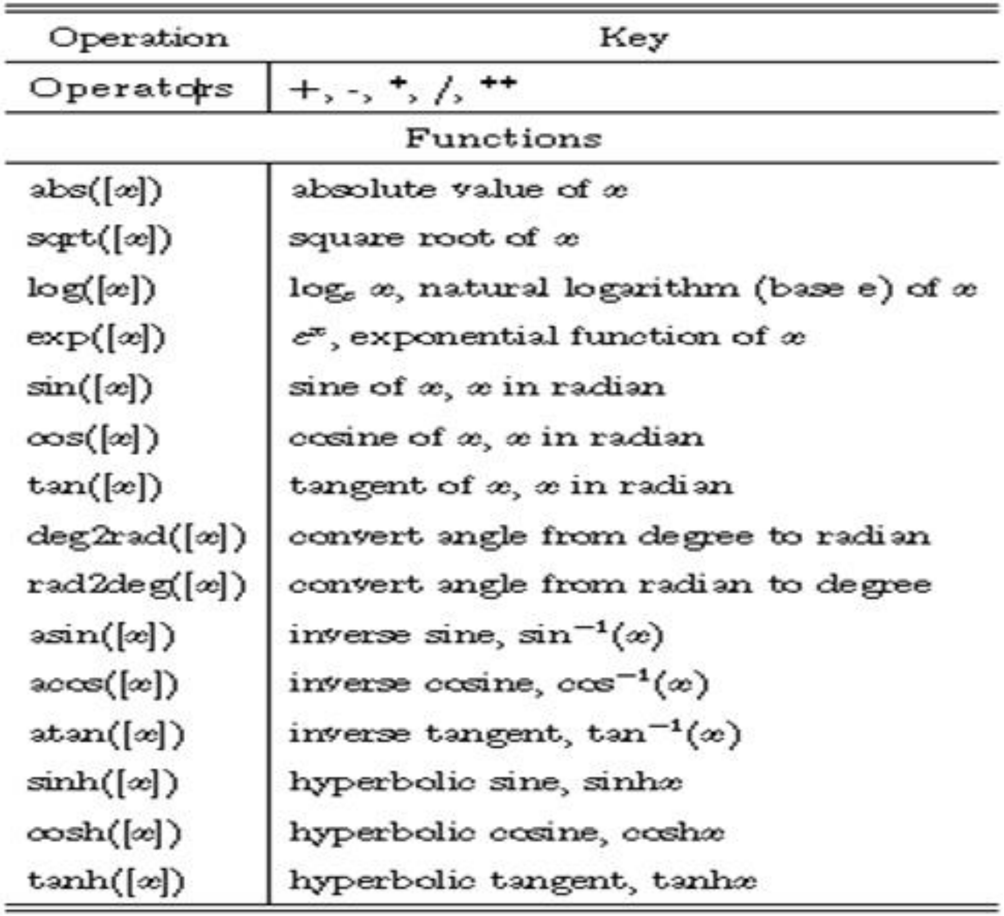
	X
Col Name	A
Col Oper.	cos(deg2rad([A]))
1	180.091298613428
2	170.61149275586
3	166.671495345084
4	161.07365747985

cos(deg2rad([a]))





The operators and functions in Column Operation

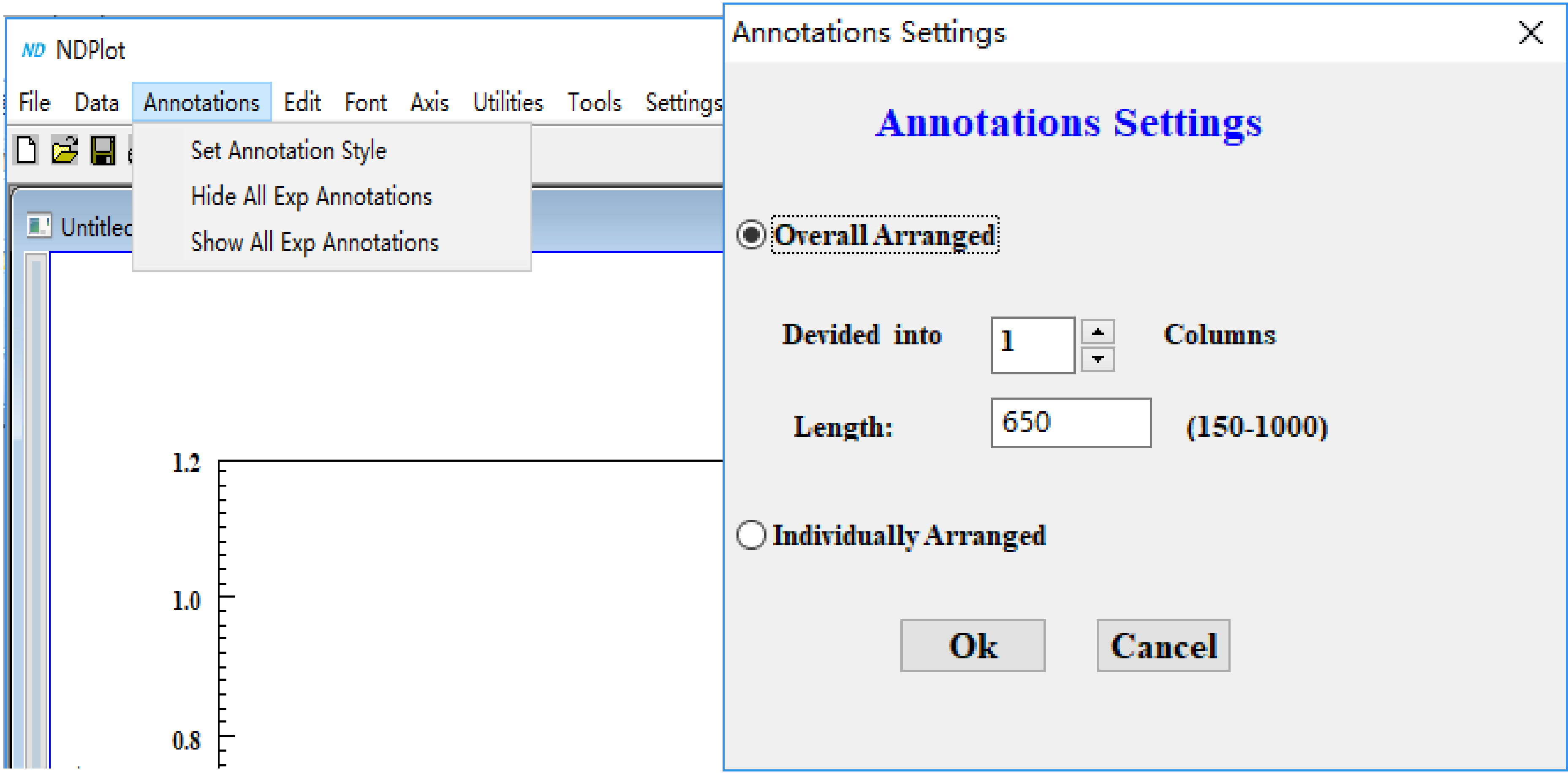


Operation	Key
Operators	+, -, *, /, **
Functions	
abs([x])	absolute value of x
sqrt([x])	square root of x
log([x])	$\log_e x$, natural logarithm (base e) of x
exp([x])	e^x, exponential function of x
sin([x])	sine of x, x in radian
cos([x])	cosine of x, x in radian
tan([x])	tangent of x, x in radian
deg2rad([x])	convert angle from degree to radian
rad2deg([x])	convert angle from radian to degree
asin([x])	inverse sine, $\sin^{-1}(x)$
acos([x])	inverse cosine, $\cos^{-1}(x)$
atan([x])	inverse tangent, $\tan^{-1}(x)$
sinh([x])	hyperbolic sine, $\sinh x$
cosh([x])	hyperbolic cosine, $\cosh x$
tanh([x])	hyperbolic tangent, $\tanh x$

- [Data->Chain Yield(Evaluated)]: Chain Yield of Fission Product
- [Data->Yield Energy Independence(Evaluated)]: Yield Energy Independence of Fission Product

Introduction of NDPlot

■[Annotations Menu]


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Set Annotation Style
Hide All Exp Annotations
Show All Exp Annotations
Untitled
1.2
1.0
0.8
Annotations Settings
Ok
Cancel

Annotations Settings

● **Overall Arranged**

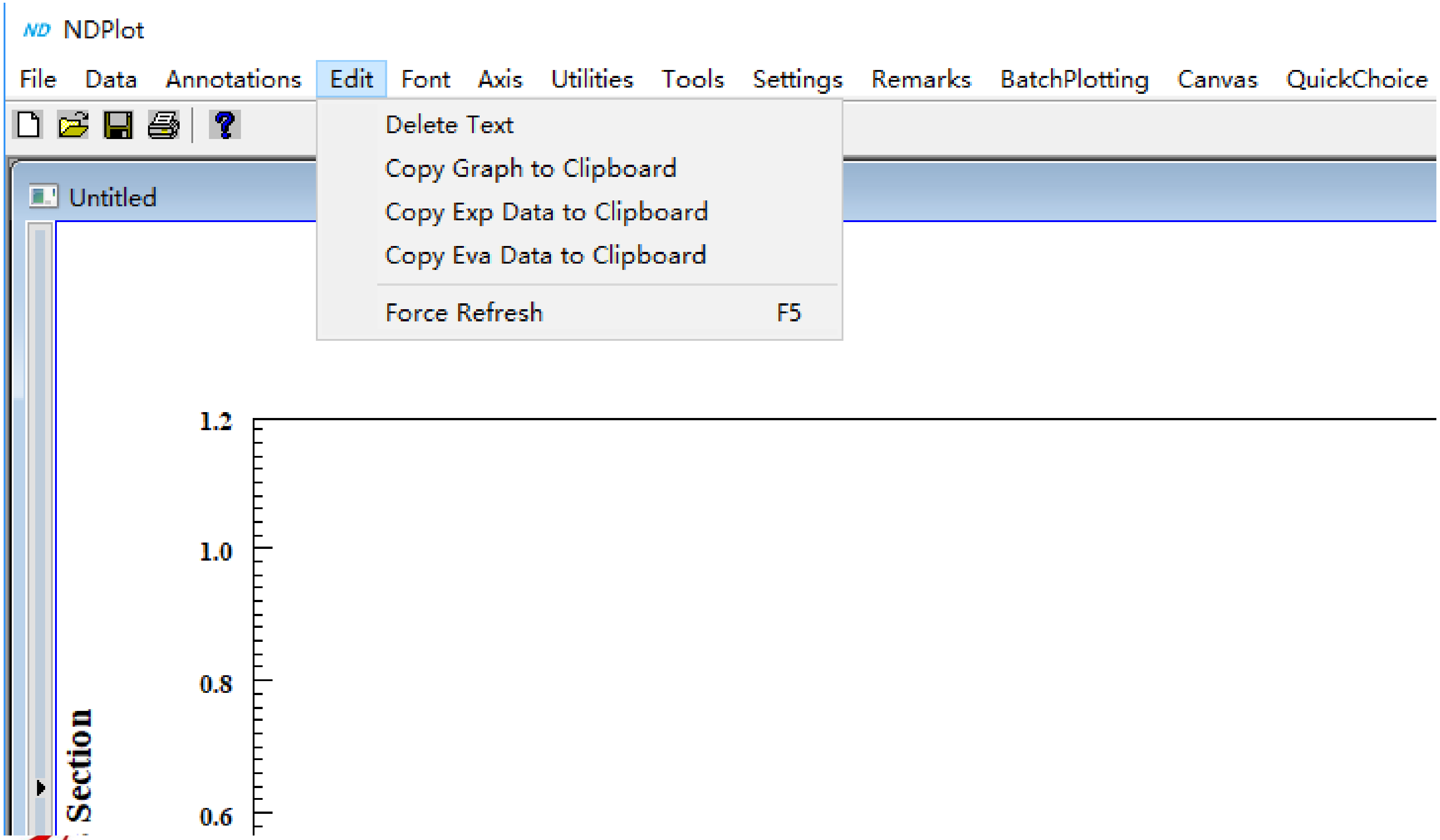
Devided into 1 **Columns**

Length: 650 **(150-1000)**

○ **Individually Arranged**

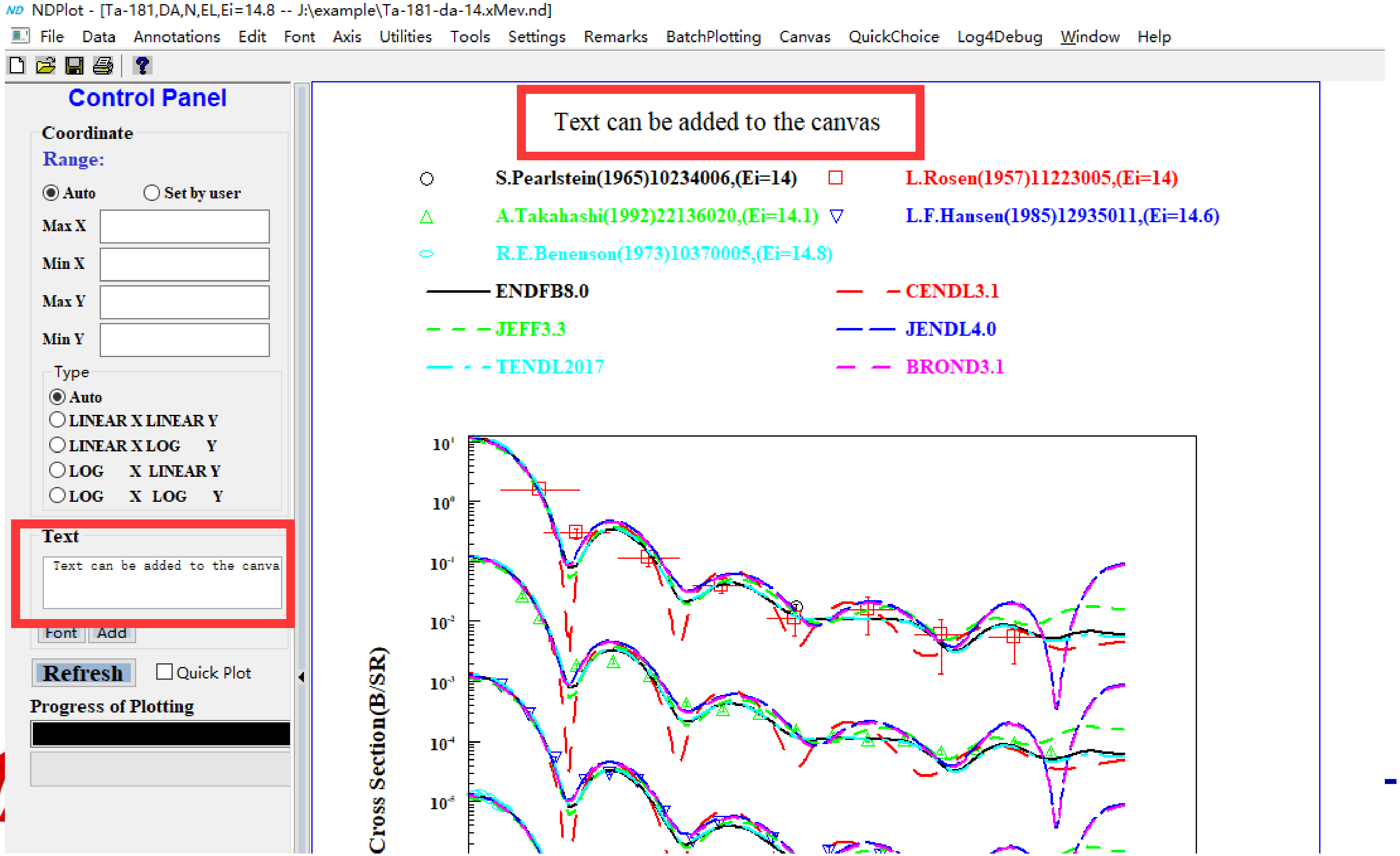
Introduction of NDPlot

- [Edit]


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Delete Text
Copy Graph to Clipboard
Copy Exp Data to Clipboard
Copy Eva Data to Clipboard
Force Refresh F5
Untitled
1.2
1.0
0.8
0.6
Section

[Edit->Delete Text]

Any text box can be added to the canvas



NDPlot - [Ta-181,DA,N,EL,Ei=14.8 -- J:\example\Ta-181-da-14.xMev.nd]

Text can be added to the canvas

Coordinate Range: ● Auto ○ Set by user

Max X

Min X

Max Y

Min Y

Type

● Auto

○ LINEAR X LINEAR Y

○ LINEAR X LOG Y

○ LOG X LINEAR Y

○ LOG X LOG Y

Text

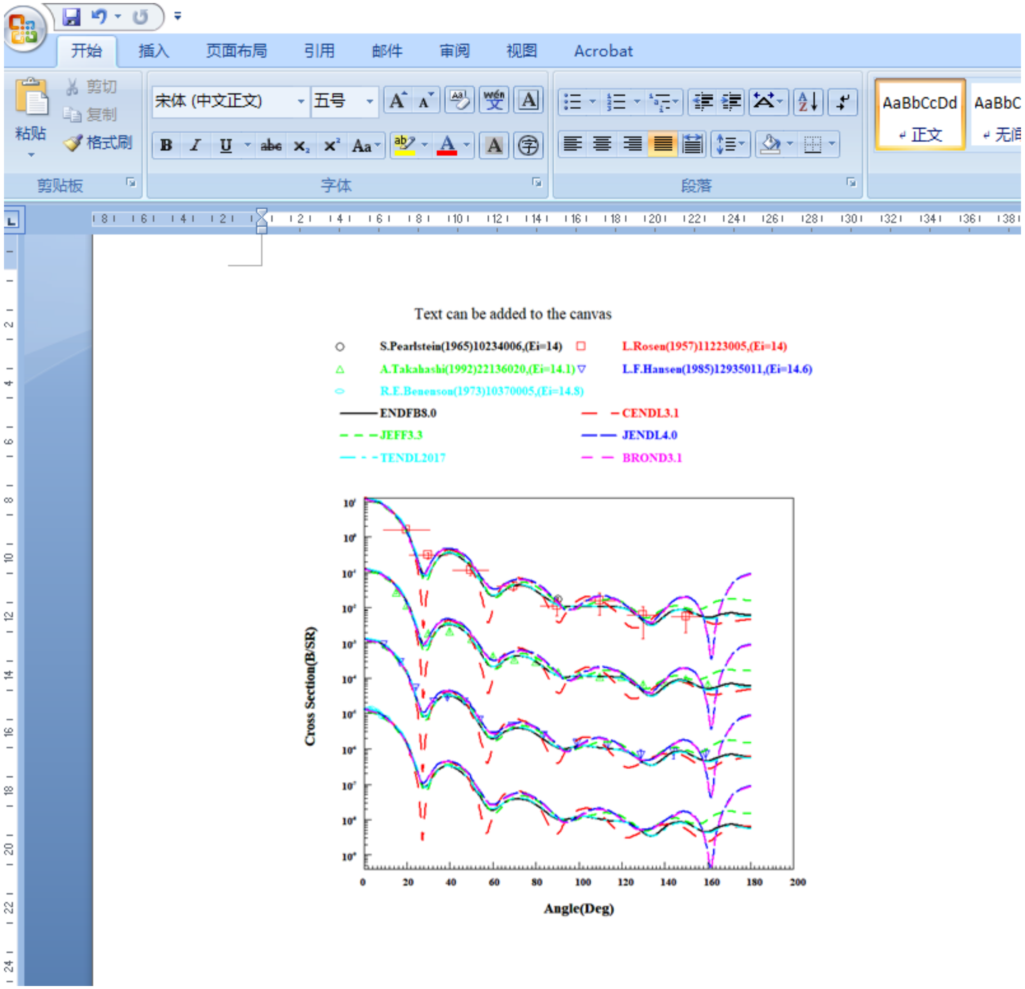
Text can be added to the canva

☐ Quick Plot

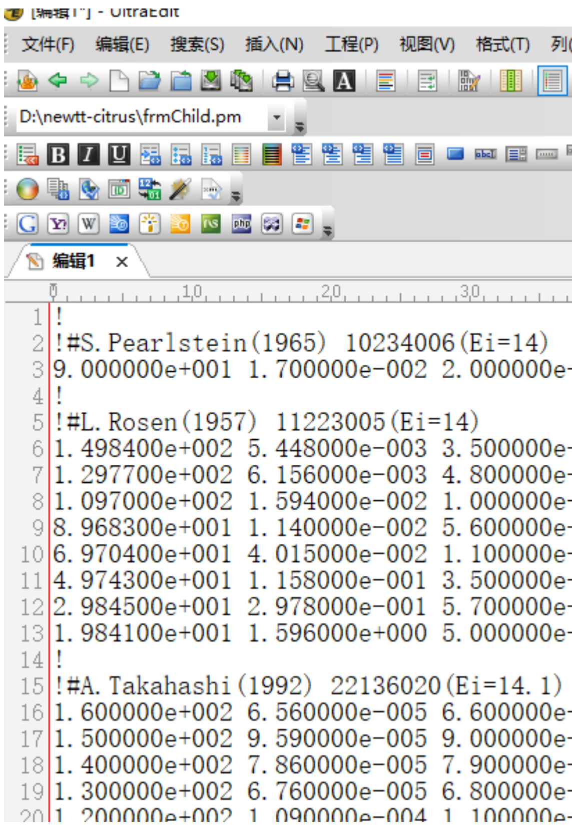
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
Control Panel
Font
Add
Refresh
Progress of Plotting
○ S.Pearlstein(1965)10234006,(Ei=14)
□ L.Rosen(1957)11223005,(Ei=14)
△ A.Takahashi(1992)22136020,(Ei=14.1)
▽ L.F.Hansen(1985)12935011,(Ei=14.6)
⬭ R.E.Benenson(1973)10370005,(Ei=14.8)
ENDFB8.0
CENDL3.1
JEFF3.3
JENDL4.0
TENDL2017
BROND3.1
10^1
10^0
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
Cross Section(B/SR)

[Edit->Clipboard]

Graph
Exp. Data
Eva. Data


开始
插入
页面布局
引用
邮件
审阅
视图
Acrobat
粘贴
剪切
复制
格式刷
剪贴板
宋体 (中文正文)
五号
字体
段落
AaBbCcDd
正文
AaBbC
无间
S.Pearlstein(1965)10234006,(Ei=14)
L.Rosen(1957)11223005,(Ei=14)
A.Takahashi(1992)22136020,(Ei=14.1)
L.F.Hansen(1985)12935011,(Ei=14.6)
R.E.Benenson(1973)10370005,(Ei=14.8)
ENDFB8.0
CENDL3.1
JEFF3.3
JENDL4.0
TENDL2017
BROND3.1
Cross Section(B/SR)
Angle(Deg)
0
20
40
60
80
100
120
140
160
180
200

Text can be added to the canvas

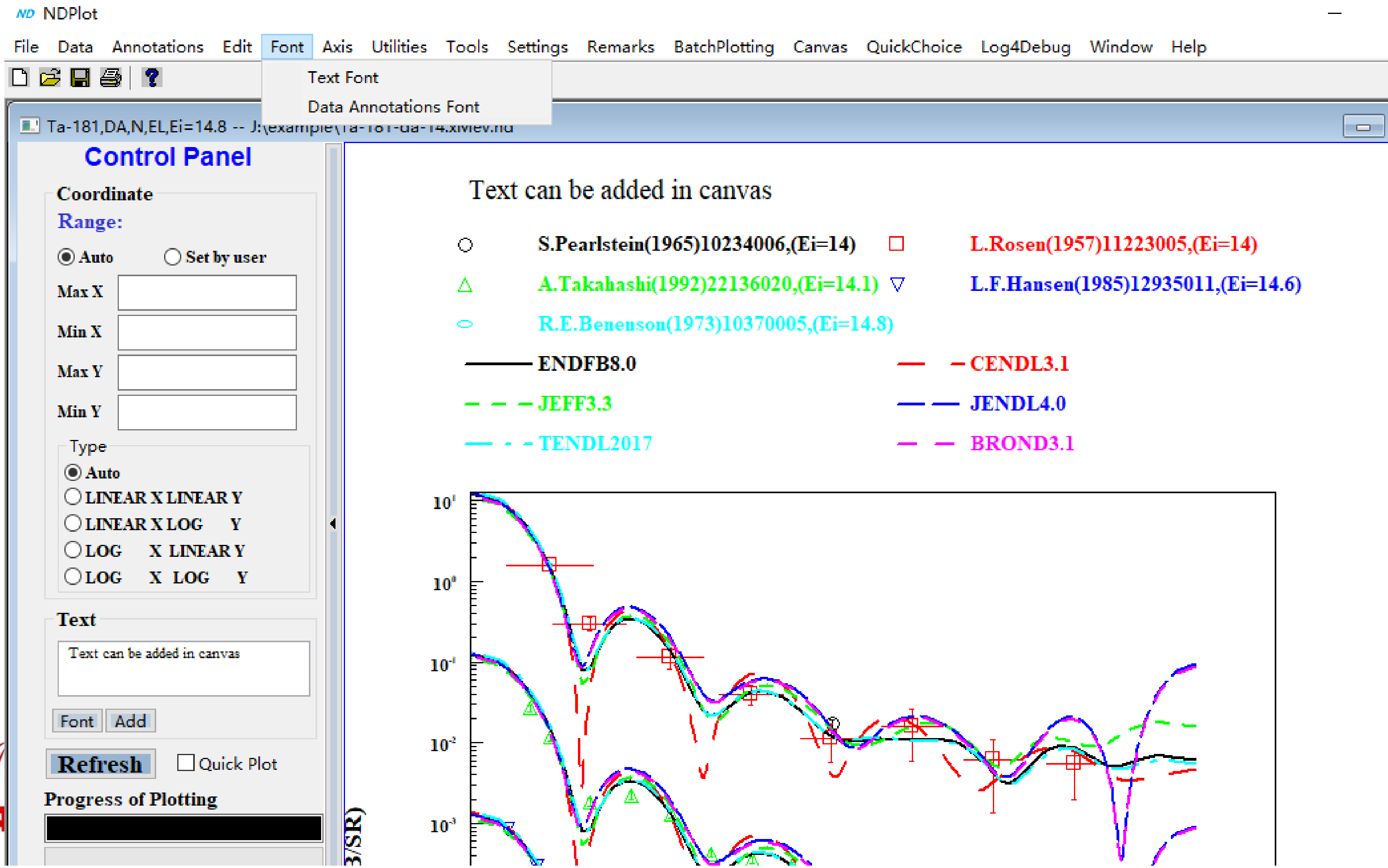

[编辑1*] - UltraEdit
文件(F)
编辑(E)
搜索(S)
插入(N)
工程(P)
视图(V)
格式(T)
编辑1

D:\newtt-citrus\frmChild.pm

```
!
!#S.Pearlstein(1965) 10234006(Ei=14)
9.000000e+001 1.700000e-002 2.000000e-
!
!#L.Rosen(1957) 11223005(Ei=14)
1.498400e+002 5.448000e-003 3.500000e-
1.297700e+002 6.156000e-003 4.800000e-
1.097000e+002 1.594000e-002 1.000000e-
8.968300e+001 1.140000e-002 5.600000e-
6.970400e+001 4.015000e-002 1.100000e-
4.974300e+001 1.158000e-001 3.500000e-
2.984500e+001 2.978000e-001 5.700000e-
1.984100e+001 1.596000e+000 5.000000e-
!
!#A.Takahashi(1992) 22136020(Ei=14.1)
1.600000e+002 6.560000e-005 6.600000e-
1.500000e+002 9.590000e-005 9.000000e-
1.400000e+002 7.860000e-005 7.900000e-
1.300000e+002 6.760000e-005 6.800000e-
1.200000e+002 1.090000e-004 1.100000e-
```

Introduction of NDPlot

■[Font]


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
Text Font
Data Annotations Font
Ta-181,DA,N,EL,Ei=14.8 -- J:\example\Ta-181-da-14.xMeV.nd
Control Panel
Coordinate
Range:
Max X
Min X
Max Y
Min Y
Type
Text
Font
Add
Refresh
Progress of Plotting
10¹
10⁰
10⁻¹
10⁻²
10⁻³
B/SR)

Range: ● Auto ○ Set by user

Type: ● Auto ○ LINEAR X LINEAR Y ○ LINEAR X LOG Y ○ LOG X LINEAR Y ○ LOG X LOG Y

Text: Text can be added in canvas

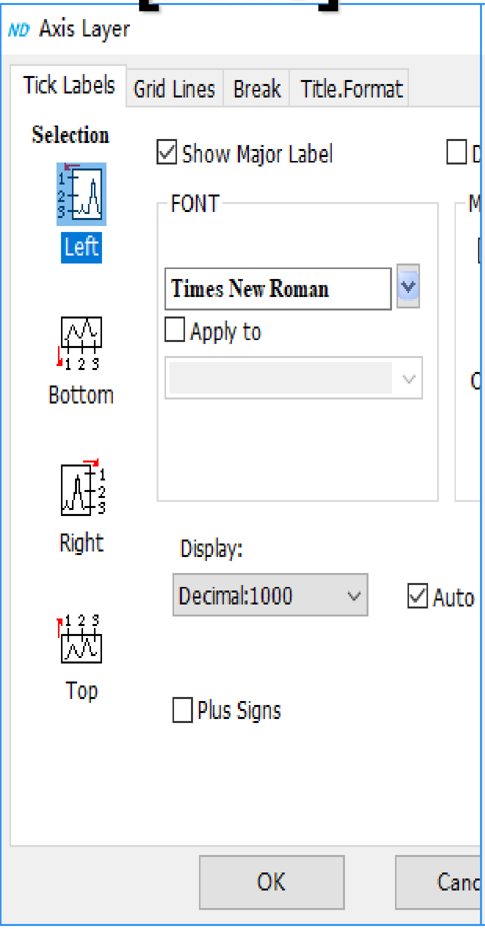
☐ Quick Plot

Text can be added in canvas

○	S.Pearlstein(1965)10234006,(Ei=14)	□	L.Rosen(1957)11223005,(Ei=14)
△	A.Takahashi(1992)22136020,(Ei=14.1)	▽	L.F.Hansen(1985)12935011,(Ei=14.6)
⬭	R.E.Benenson(1973)10370005,(Ei=14.8)		
——	ENDFB8.0	— —	CENDL3.1
– – –	JEFF3.3	——	JENDL4.0
— · –	TENDL2017	— —	BROND3.1

Introduction of NDPlot

■[Axis]


ND Axis Layer
Tick Labels
Grid Lines
Break
Title.Format
Selection
Left
Bottom
Right
Top
FONT
M
C
OK
Canc

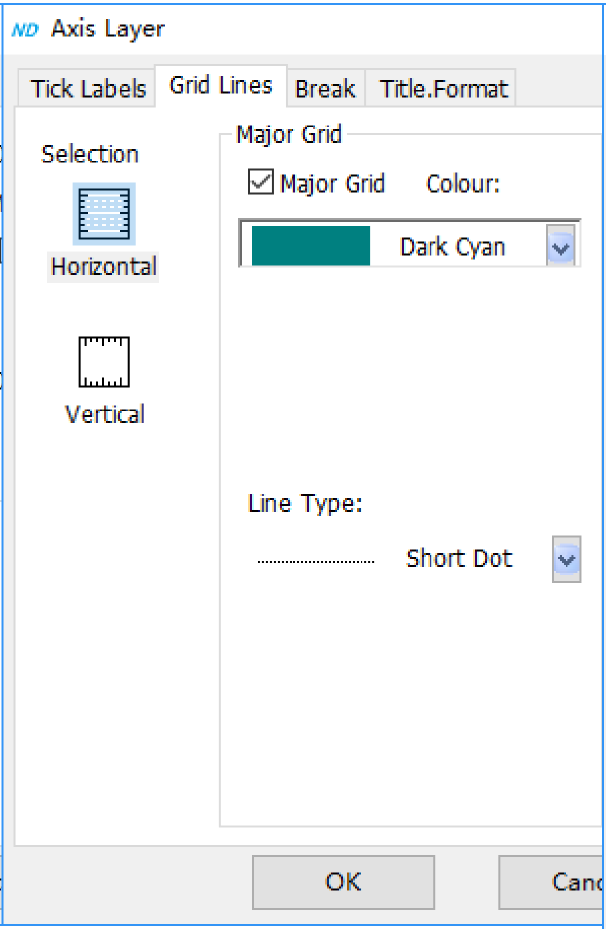
☑ Show Major Label ☐ D

Times New Roman

☐ Apply to

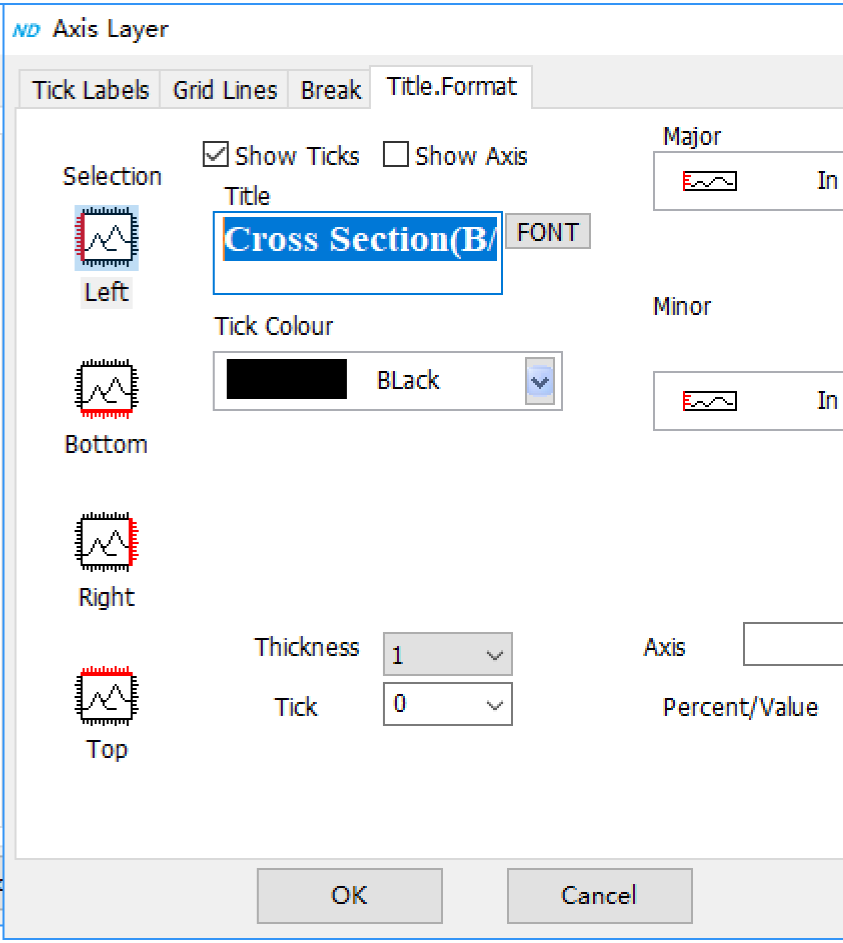
Display: Decimal:1000 ☑ Auto

☐ Plus Signs


ND Axis Layer
Tick Labels
Grid Lines
Break
Title.Format
Selection
Horizontal
Vertical
Major Grid
OK
Canc

☑ Major Grid Colour: Dark Cyan

Line Type: Short Dot


ND Axis Layer
Tick Labels
Grid Lines
Break
Title.Format
Selection
Left
Bottom
Right
Top
FONT
Major
Minor
OK
Cancel

☑ Show Ticks ☐ Show Axis

Title: Cross Section(B/

Tick Colour: BLack

Major: In

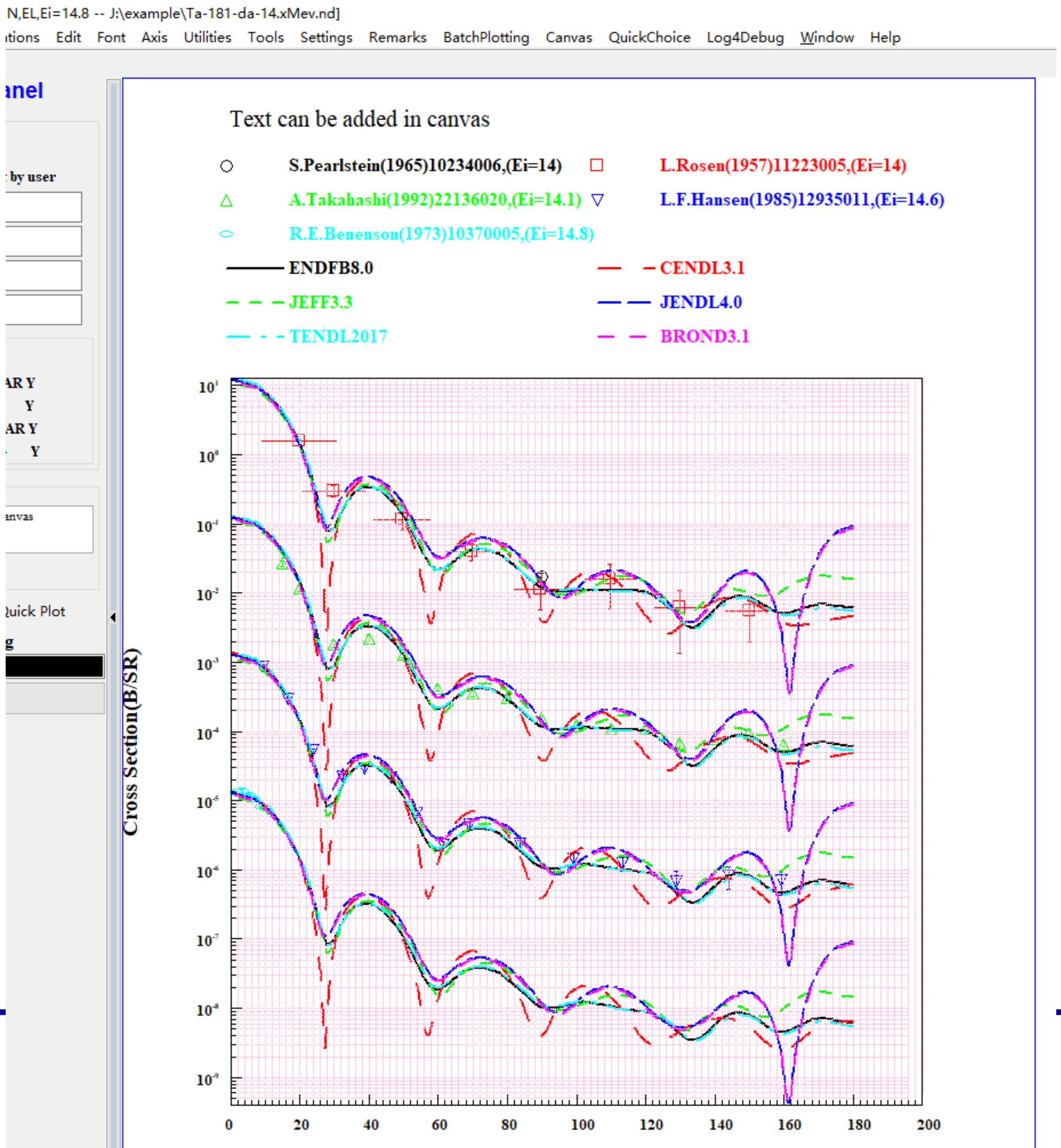
Minor: In

Thickness: 1

Tick: 0

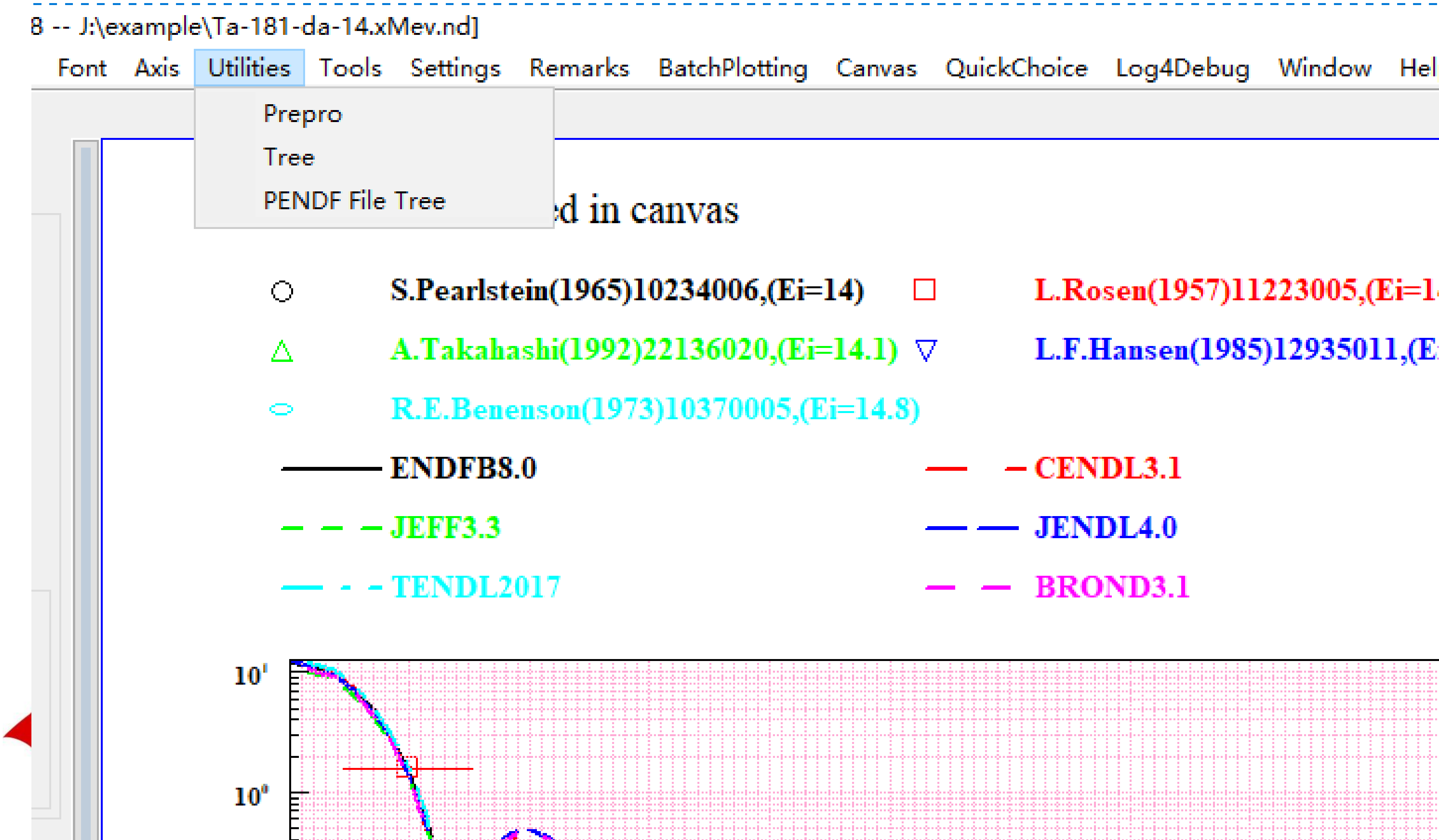
Axis

Percent/Value

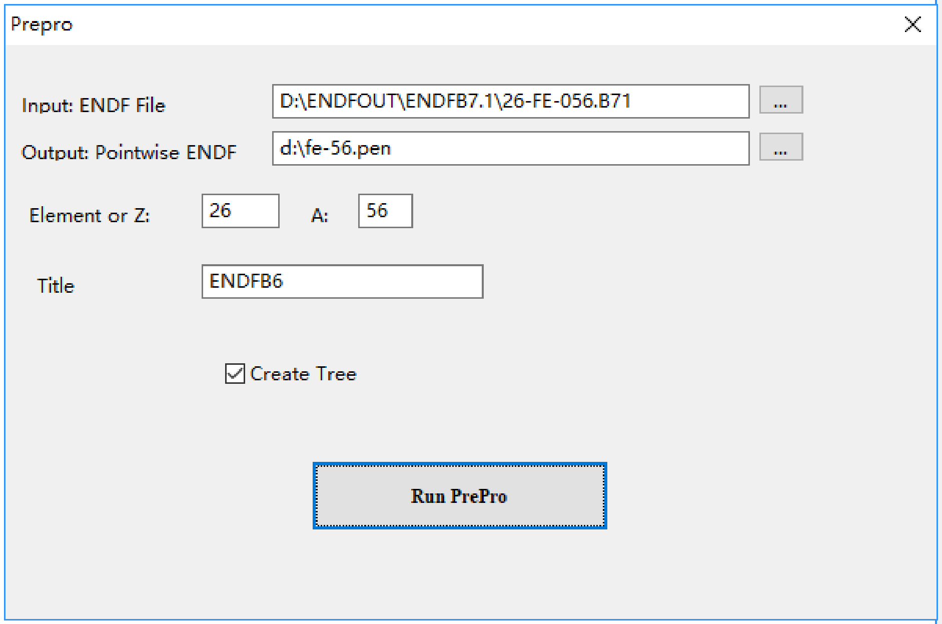

N,EL,Ei=14.8 -- J:\example\Ta-181-da-14.xMev.nd]
ıtions Edit Font Axis Utilities Tools Settings Remarks BatchPlotting Canvas QuickChoice Log4Debug Window Help
ınel
: by user
AR Y
Y
AR Y
Y
anvas
Quick Plot
g
Text can be added in canvas
○ S.Pearlstein(1965)10234006,(Ei=14)
□ L.Rosen(1957)11223005,(Ei=14)
△ A.Takahashi(1992)22136020,(Ei=14.1)
▽ L.F.Hansen(1985)12935011,(Ei=14.6)
⬭ R.E.Benenson(1973)10370005,(Ei=14.8)
ENDFB8.0
CENDL3.1
JEFF3.3
JENDL4.0
TENDL2017
BROND3.1
Cross Section(B/SR)
10¹
10⁰
10⁻¹
10⁻²
10⁻³
10⁻⁴
10⁻⁵
10⁻⁶
10⁻⁷
10⁻⁸
10⁻⁹
0
20
40
60
80
100
120
140
160
180
200

Introduction of NDPlot

■[Utilities]


8 -- J:\example\Ta-181-da-14.xMev.nd]
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Hel
Prepro
Tree
PENDF File Tree
d in canvas
○ S.Pearlstein(1965)10234006,(Ei=14)
□ L.Rosen(1957)11223005,(Ei=1
△ A.Takahashi(1992)22136020,(Ei=14.1)
▽ L.F.Hansen(1985)12935011,(E
R.E.Benenson(1973)10370005,(Ei=14.8)
ENDFB8.0
CENDL3.1
JEFF3.3
JENDL4.0
TENDL2017
BROND3.1
10^1
10^0

[Utilities->Prepro]



Prepro

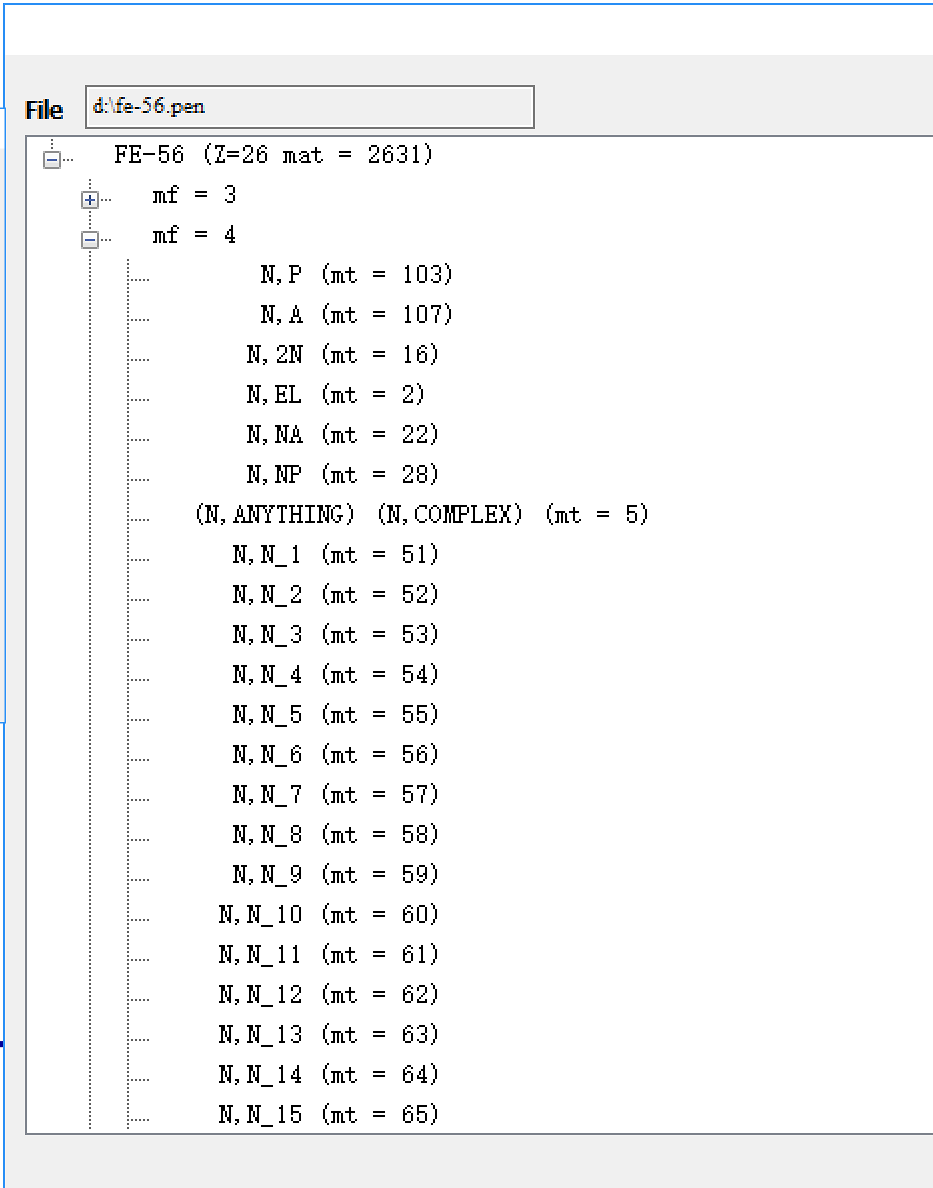
Input: ENDF File: D:\ENDFOUT\ENDFB7.1\26-FE-056.B71

Output: Pointwise ENDF: d:\fe-56.pen

Element or Z: 26 A: 56

Title: ENDFB6

☑ Create Tree

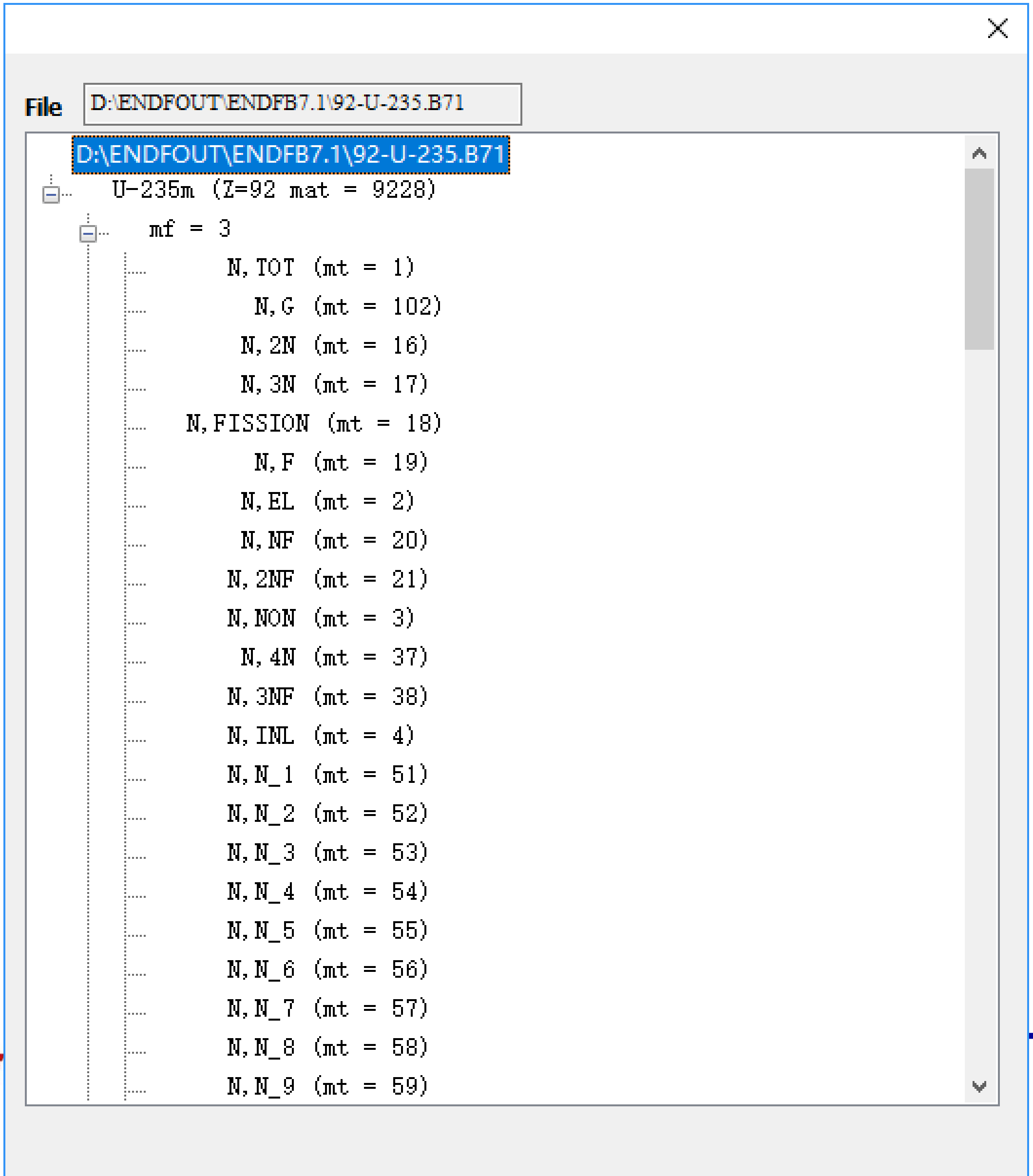


File: d:\fe-56.pen

```
FE-56 (Z=26 mat = 2631)
    mf = 3
    mf = 4
              N,P (mt = 103)
              N,A (mt = 107)
             N,2N (mt = 16)
             N,EL (mt = 2)
             N,NA (mt = 22)
             N,NP (mt = 28)
    (N,ANYTHING) (N,COMPLEX) (mt = 5)
            N,N_1 (mt = 51)
            N,N_2 (mt = 52)
            N,N_3 (mt = 53)
            N,N_4 (mt = 54)
            N,N_5 (mt = 55)
            N,N_6 (mt = 56)
            N,N_7 (mt = 57)
            N,N_8 (mt = 58)
            N,N_9 (mt = 59)
           N,N_10 (mt = 60)
           N,N_11 (mt = 61)
           N,N_12 (mt = 62)
           N,N_13 (mt = 63)
           N,N_14 (mt = 64)
           N,N_15 (mt = 65)
```

MF=3,4,5,6

[Utilities->(P)Endf File Tree]



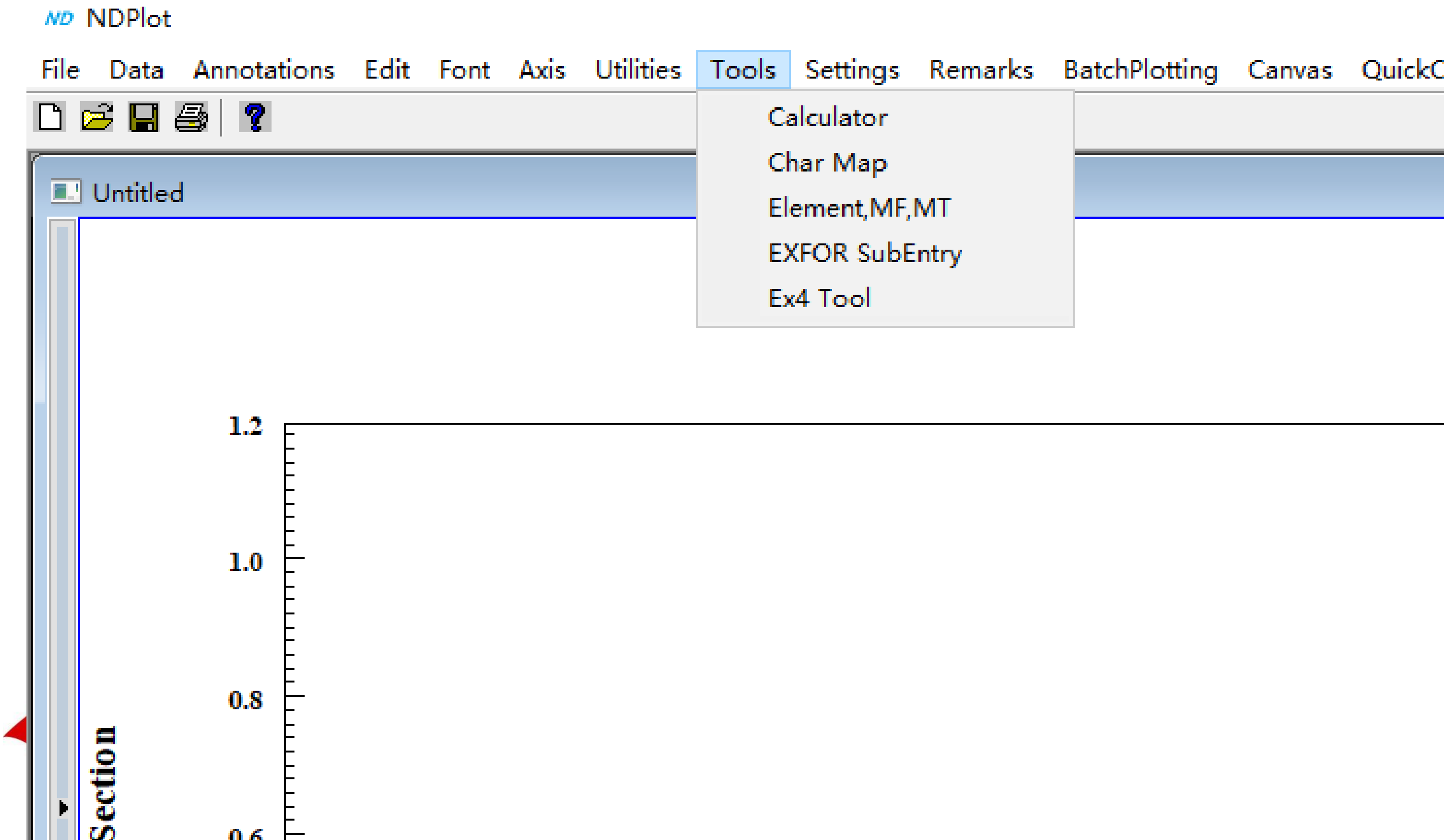
File D:\ENDFOUT\ENDFB7.1\92-U-235.B71

```
D:\ENDFOUT\ENDFB7.1\92-U-235.B71
  U-235m (Z=92 mat = 9228)
    mf = 3
        N,TOT (mt = 1)
          N,G (mt = 102)
         N,2N (mt = 16)
         N,3N (mt = 17)
    N,FISSION (mt = 18)
          N,F (mt = 19)
         N,EL (mt = 2)
         N,NF (mt = 20)
        N,2NF (mt = 21)
        N,NON (mt = 3)
         N,4N (mt = 37)
        N,3NF (mt = 38)
        N,INL (mt = 4)
        N,N_1 (mt = 51)
        N,N_2 (mt = 52)
        N,N_3 (mt = 53)
        N,N_4 (mt = 54)
        N,N_5 (mt = 55)
        N,N_6 (mt = 56)
        N,N_7 (mt = 57)
        N,N_8 (mt = 58)
        N,N_9 (mt = 59)
```

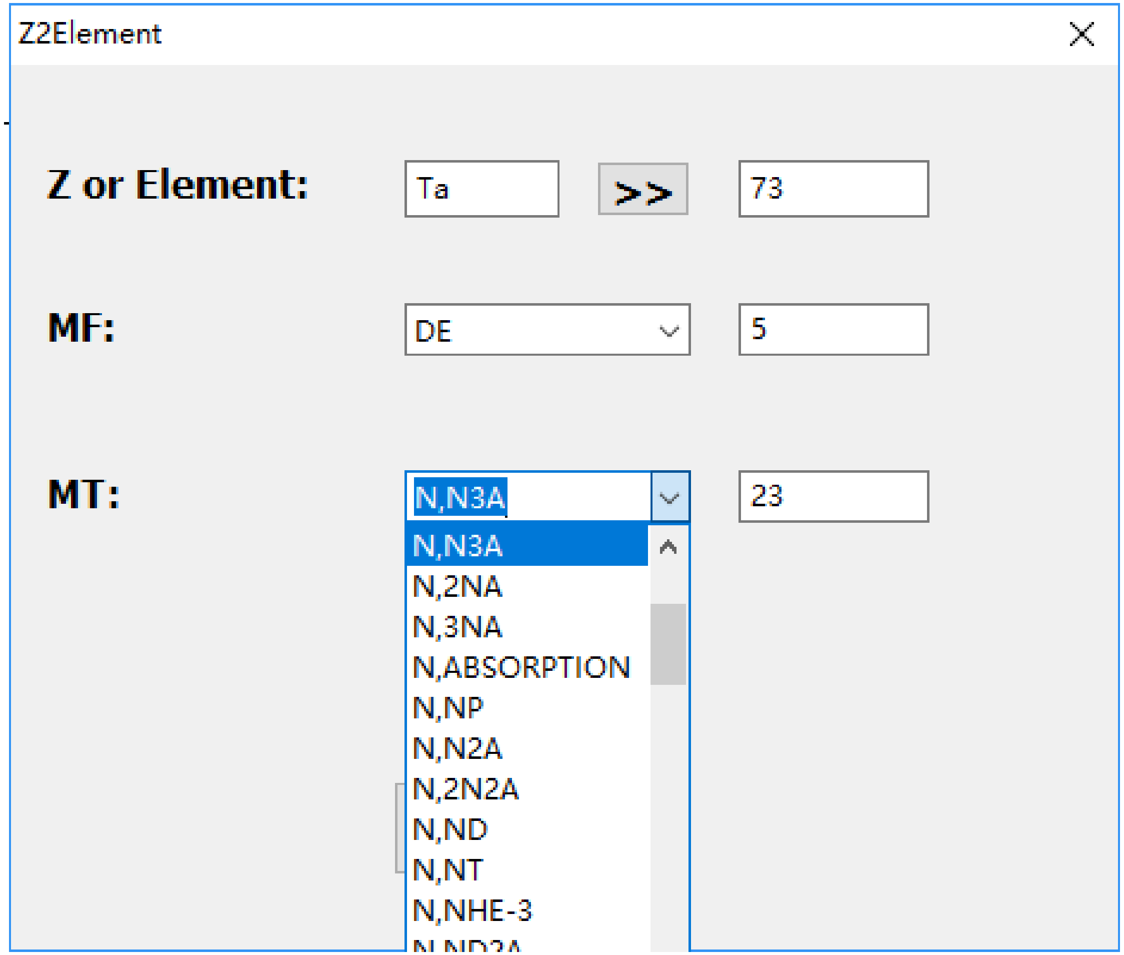
MF=3,4,5,6

Introduction of NDPlot

■[Tools]


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
Calculator
Char Map
Element,MF,MT
EXFOR SubEntry
Ex4 Tool
Untitled
1.2
1.0
0.8
Section

[Tools-Element,MF,MT]



Z2Element

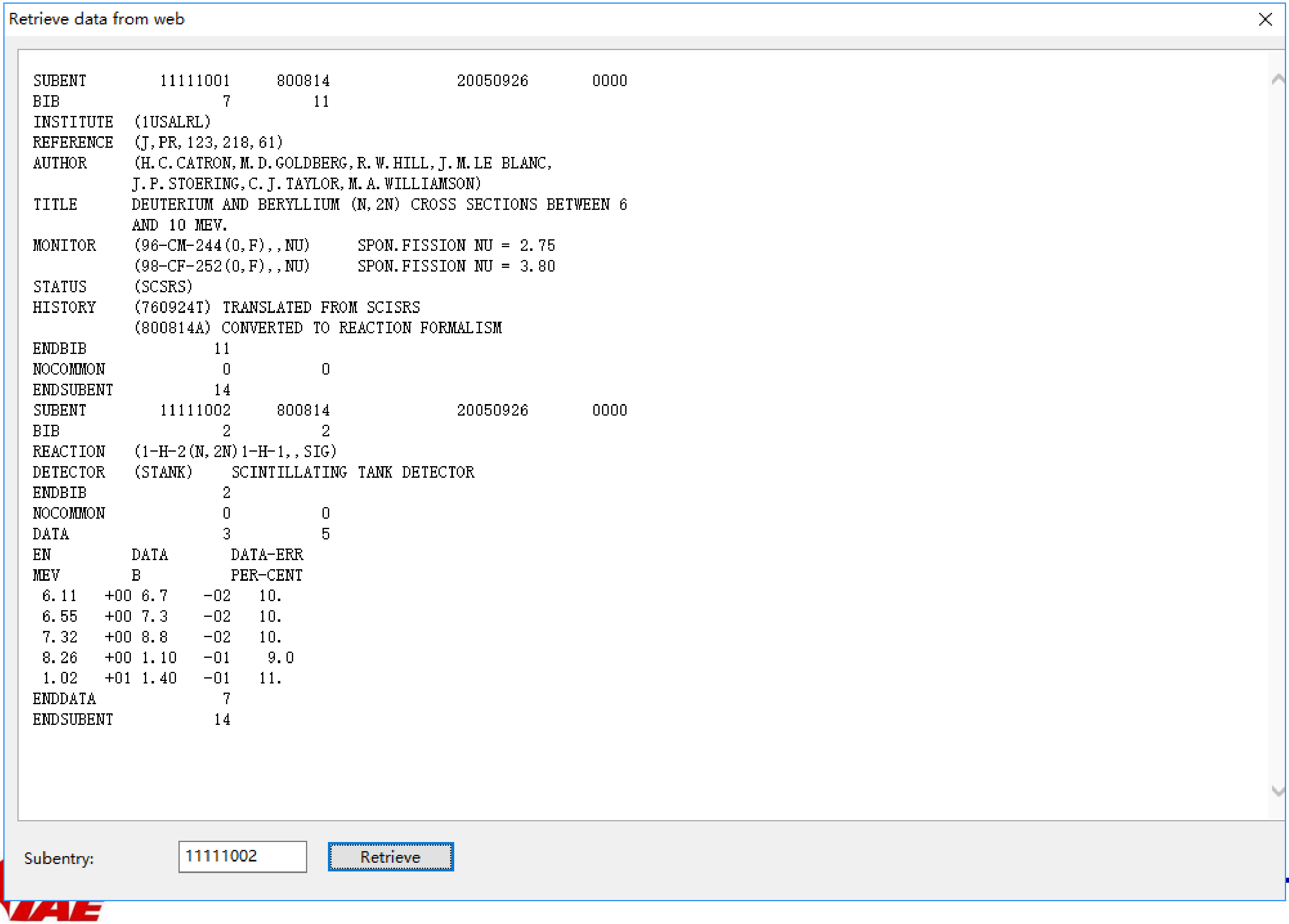
Z or Element: Ta 73

MF: DE 5

MT: N,N3A 23

>>
N,N3A
N,2NA
N,3NA
N,ABSORPTION
N,NP
N,N2A
N,2N2A
N,ND
N,NT
N,NHE-3

[Tools->EX4 SubEntry]

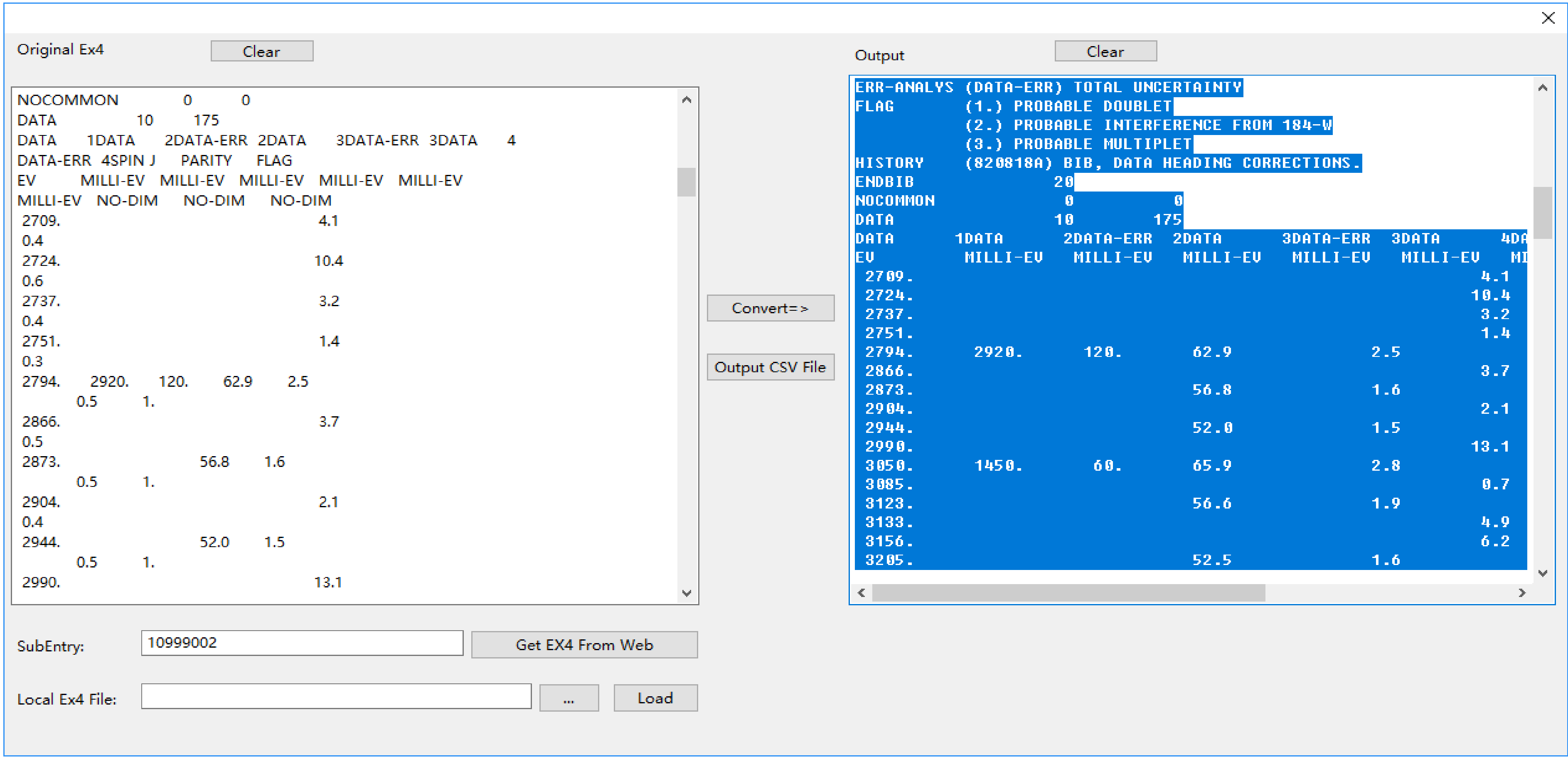


```
SUBENT       11111001    800814         20050926     0000
BIB                 7        11
INSTITUTE  (1USALRL)
REFERENCE  (J,PR,123,218,61)
AUTHOR     (H.C.CATRON,M.D.GOLDBERG,R.W.HILL,J.M.LE BLANC,
           J.P.STOERING,C.J.TAYLOR,M.A.WILLIAMSON)
TITLE      DEUTERIUM AND BERYLLIUM (N,2N) CROSS SECTIONS BETWEEN 6
           AND 10 MEV.
MONITOR    (96-CM-244(0,F),,NU)     SPON.FISSION NU = 2.75
           (98-CF-252(0,F),,NU)     SPON.FISSION NU = 3.80
STATUS     (SCSRS)
HISTORY    (760924T) TRANSLATED FROM SCISRS
           (800814A) CONVERTED TO REACTION FORMALISM
ENDBIB             11
NOCOMMON            0          0
ENDSUBENT          14
SUBENT       11111002    800814         20050926     0000
BIB                 2          2
REACTION   (1-H-2(N,2N)1-H-1,,SIG)
DETECTOR   (STANK)    SCINTILLATING TANK DETECTOR
ENDBIB              2
NOCOMMON            0          0
DATA                3          5
EN         DATA       DATA-ERR
MEV        B          PER-CENT
 6.11  +00 6.7   -02   10.
 6.55  +00 7.3   -02   10.
 7.32  +00 8.8   -02   10.
 8.26  +00 1.10  -01    9.0
 1.02  +01 1.40  -01   11.
ENDDATA             7
ENDSUBENT          14
```

Subentry: 11111002

[Tools->EX4 Tool]

10999002



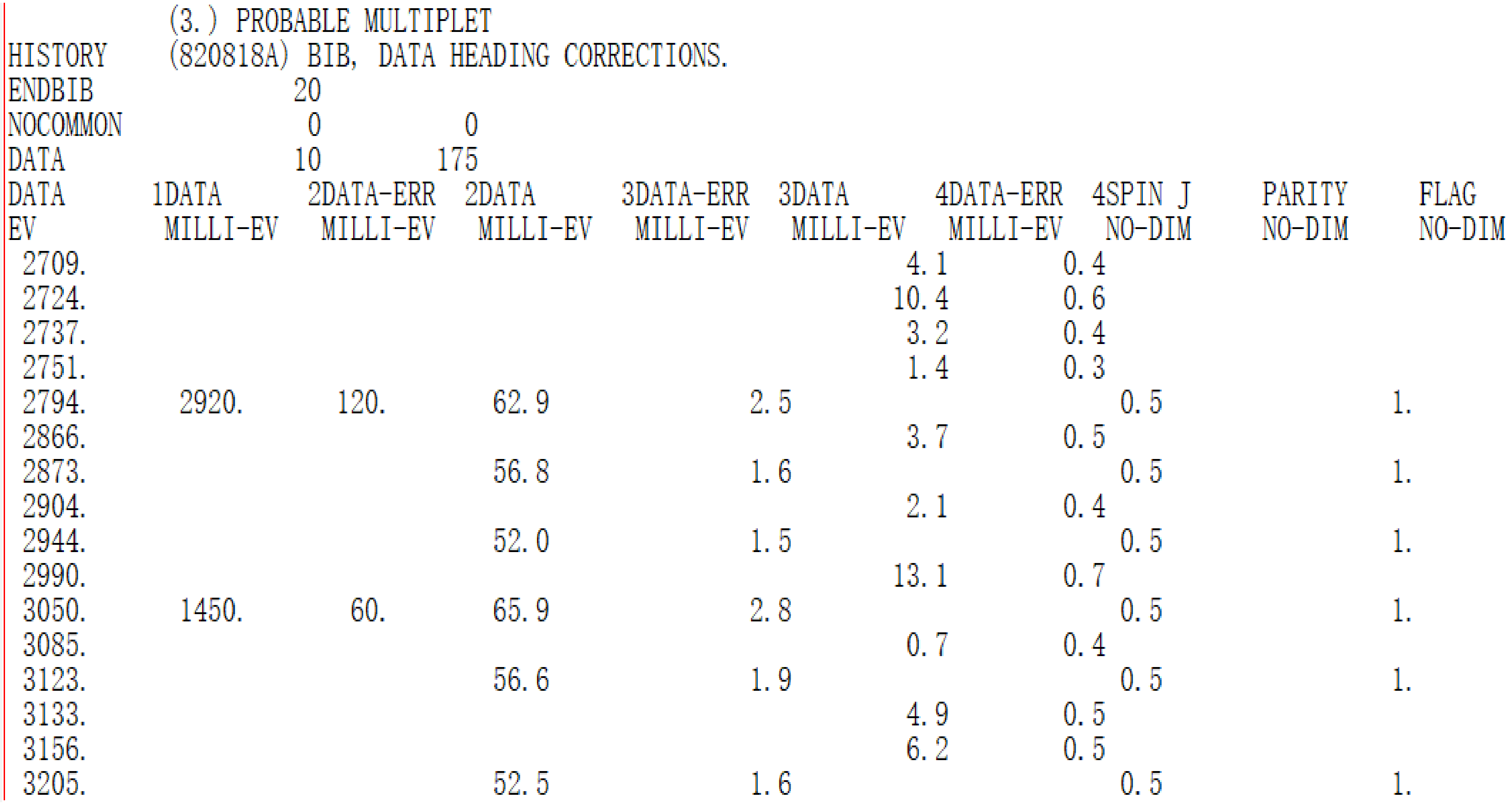
SubEntry: 10999002

Local Ex4 File:

```
NOCOMMON          0         0
DATA             10        175
DATA      1DATA     2DATA-ERR  2DATA      3DATA-ERR  3DATA       4
DATA-ERR  4SPIN J      PARITY      FLAG
EV         MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV
MILLI-EV   NO-DIM      NO-DIM      NO-DIM
 2709.                                     4.1
 0.4
 2724.                                    10.4
 0.6
 2737.                                     3.2
 0.4
 2751.                                     1.4
 0.3
 2794.    2920.     120.      62.9      2.5
        0.5        1.
 2866.                                     3.7
 0.5
 2873.                      56.8      1.6
        0.5        1.
 2904.                                     2.1
 0.4
 2944.                      52.0      1.5
        0.5        1.
 2990.                                    13.1
```

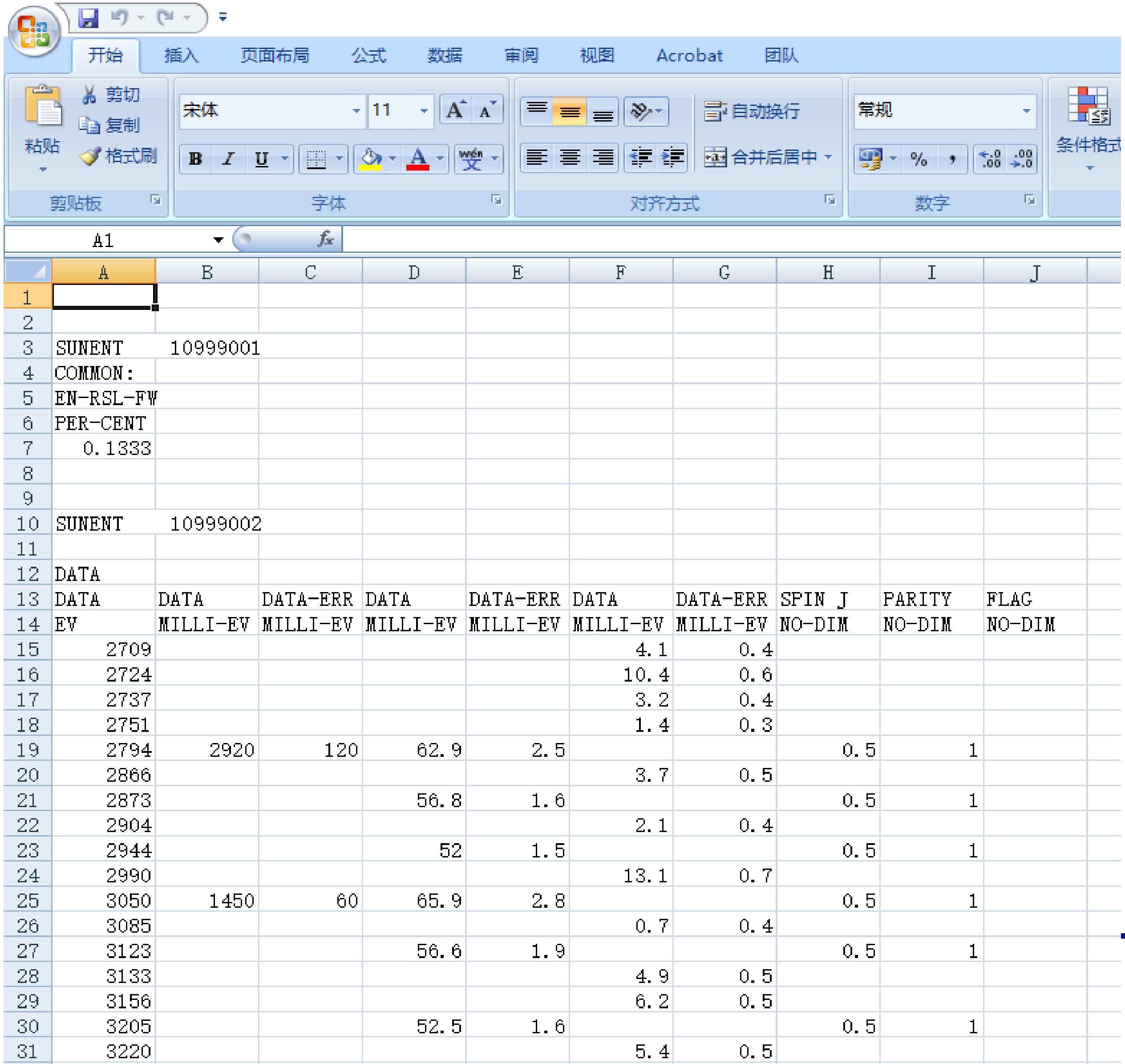
```
ERR-ANALYS (DATA-ERR) TOTAL UNCERTAINTY
FLAG       (1.) PROBABLE DOUBLET
           (2.) PROBABLE INTERFERENCE FROM 184-W
           (3.) PROBABLE MULTIPLET
HISTORY    (820818A) BIB, DATA HEADING CORRECTIONS.
ENDBIB              20
NOCOMMON             0          0
DATA                10        175
DATA      1DATA      2DATA-ERR  2DATA      3DATA-ERR  3DATA      4DA
EV         MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV   MI
 2709.                                                         4.1
 2724.                                                        10.4
 2737.                                                         3.2
 2751.                                                         1.4
 2794.      2920.      120.       62.9              2.5
 2866.                                                         3.7
 2873.                            56.8              1.6
 2904.                                                         2.1
 2944.                            52.0              1.5
 2990.                                                        13.1
 3050.      1450.       60.       65.9              2.8
 3085.                                                         0.7
 3123.                            56.6              1.9
 3133.                                                         4.9
 3156.                                                         6.2
 3205.                            52.5              1.6
```

[Tools->EX4 Tool]



```
           (3.) PROBABLE MULTIPLET
HISTORY    (820818A) BIB, DATA HEADING CORRECTIONS.
ENDBIB              20
NOCOMMON             0          0
DATA                10        175
DATA      1DATA      2DATA-ERR  2DATA      3DATA-ERR  3DATA      4DATA-ERR 4SPIN J     PARITY     FLAG
EV         MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV   MILLI-EV  NO-DIM     NO-DIM     NO-DIM
 2709.                                                         4.1        0.4
 2724.                                                        10.4        0.6
 2737.                                                         3.2        0.4
 2751.                                                         1.4        0.3
 2794.      2920.      120.       62.9              2.5                       0.5               1.
 2866.                                                         3.7        0.5
 2873.                            56.8              1.6                       0.5               1.
 2904.                                                         2.1        0.4
 2944.                            52.0              1.5                       0.5               1.
 2990.                                                        13.1        0.7
 3050.      1450.       60.       65.9              2.8                       0.5               1.
 3085.                                                         0.7        0.4
 3123.                            56.6              1.9                       0.5               1.
 3133.                                                         4.9        0.5
 3156.                                                         6.2        0.5
 3205.                            52.5              1.6                       0.5               1.
```

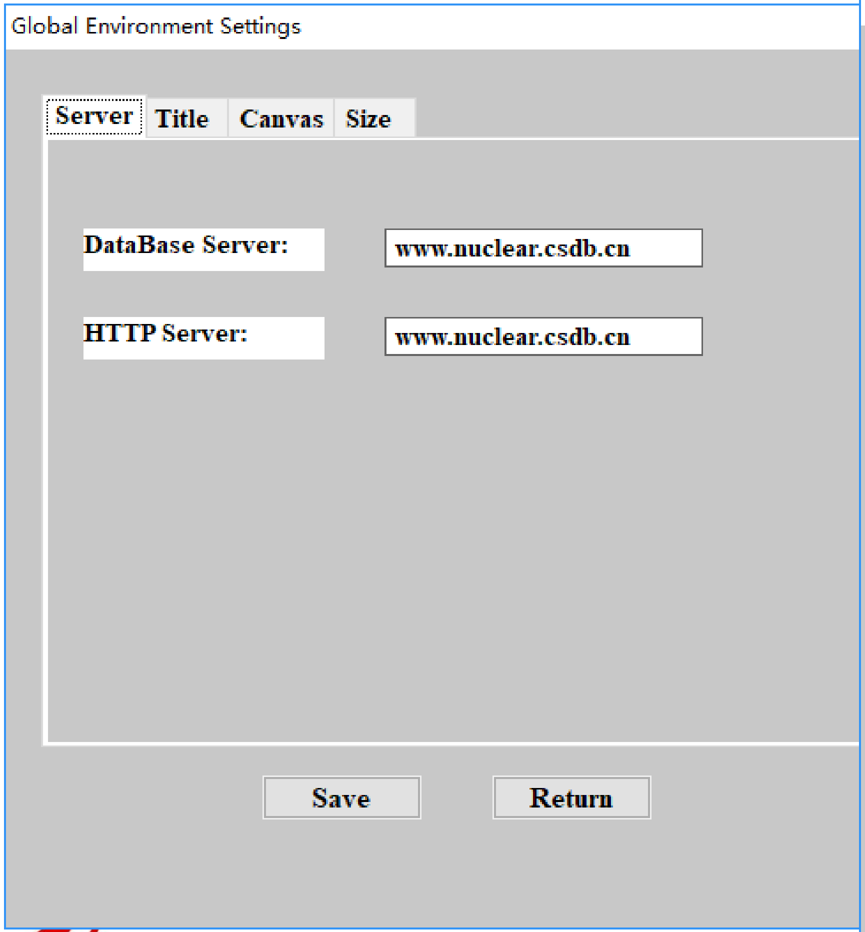
[Tools->EX4 Tool->Output CSV File]


开始
插入
页面布局
公式
数据
审阅
视图
Acrobat
团队
粘贴
剪切
复制
格式刷
剪贴板
宋体
11
字体
自动换行
合并后居中
对齐方式
常规
数字
条件格式
A1

	A	B	C	D	E	F	G	H	I	J
1										
2										
3	SUNENT	10999001								
4	COMMON:									
5	EN-RSL-FW									
6	PER-CENT									
7	0.1333									
8										
9										
10	SUNENT	10999002								
11										
12	DATA									
13	DATA	DATA	DATA-ERR	DATA	DATA-ERR	DATA	DATA-ERR	SPIN J	PARITY	FLAG
14	EV	MILLI-EV	MILLI-EV	MILLI-EV	MILLI-EV	MILLI-EV	MILLI-EV	NO-DIM	NO-DIM	NO-DIM
15	2709					4.1	0.4			
16	2724					10.4	0.6			
17	2737					3.2	0.4			
18	2751					1.4	0.3			
19	2794	2920	120	62.9	2.5			0.5	1	
20	2866					3.7	0.5			
21	2873			56.8	1.6			0.5	1	
22	2904					2.1	0.4			
23	2944			52	1.5			0.5	1	
24	2990					13.1	0.7			
25	3050	1450	60	65.9	2.8			0.5	1	
26	3085					0.7	0.4			
27	3123			56.6	1.9			0.5	1	
28	3133					4.9	0.5			
29	3156					6.2	0.5			
30	3205			52.5	1.6			0.5	1	
31	3220					5.4	0.5			

Introduction of NDPlot

■[Global Environment Settings]



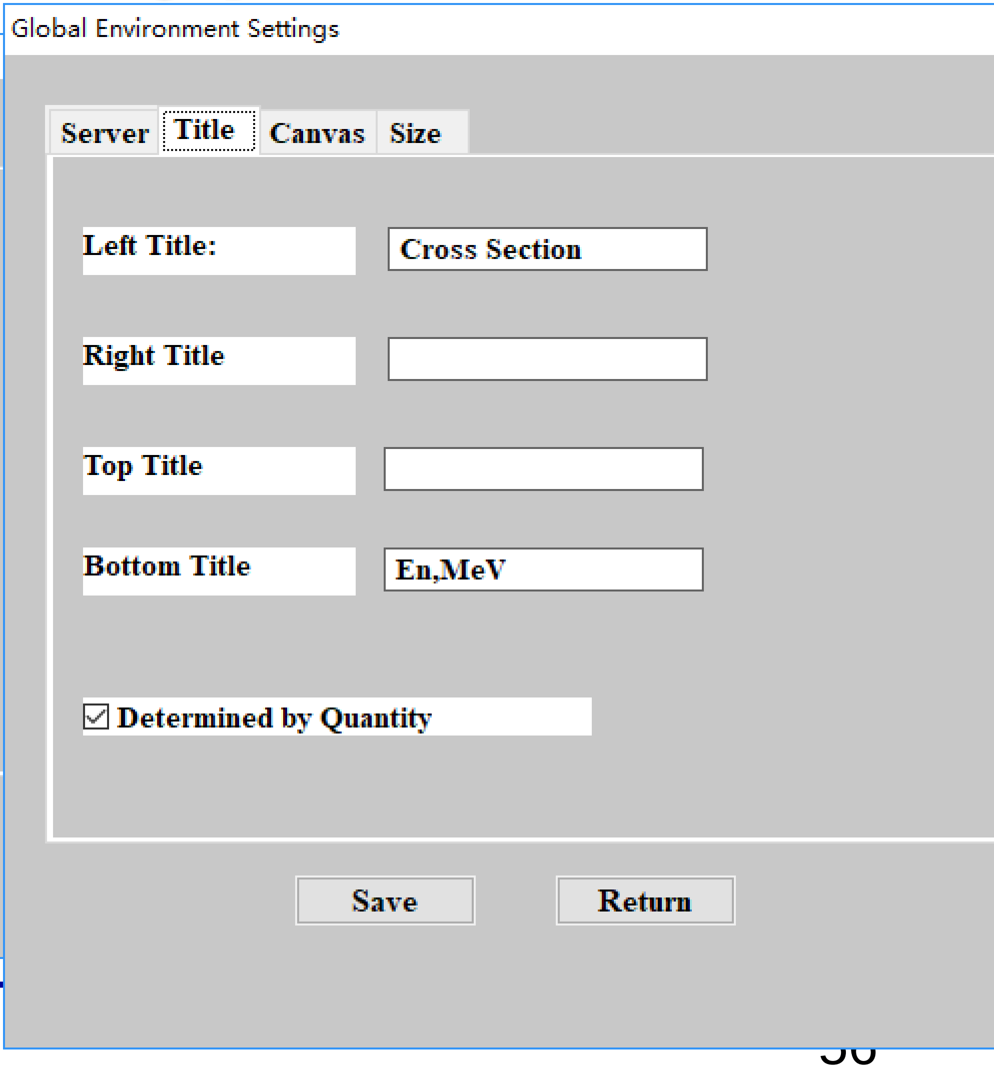
Global Environment Settings

Server
Title
Canvas
Size

DataBase Server: www.nuclear.csdb.cn

HTTP Server: www.nuclear.csdb.cn

Save
Return



Global Environment Settings

Server
Title
Canvas
Size

Left Title: Cross Section

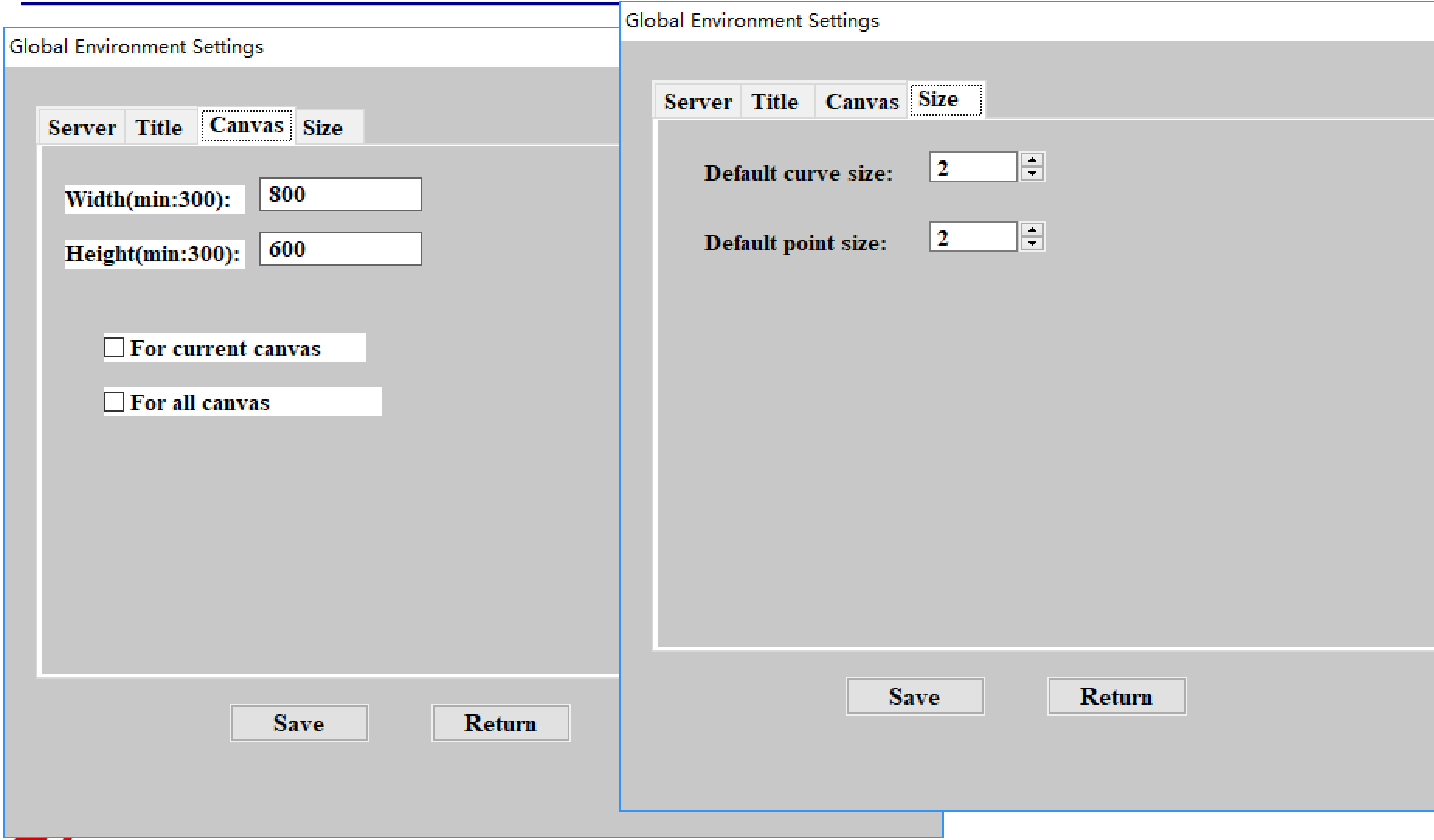
Right Title

Top Title

Bottom Title En,MeV

☑ Determined by Quantity

Save
Return


Server
Title
Canvas
Size
Save
Return

Global Environment Settings

Width(min:300): 800

Height(min:300): 600

☐ For current canvas

☐ For all canvas

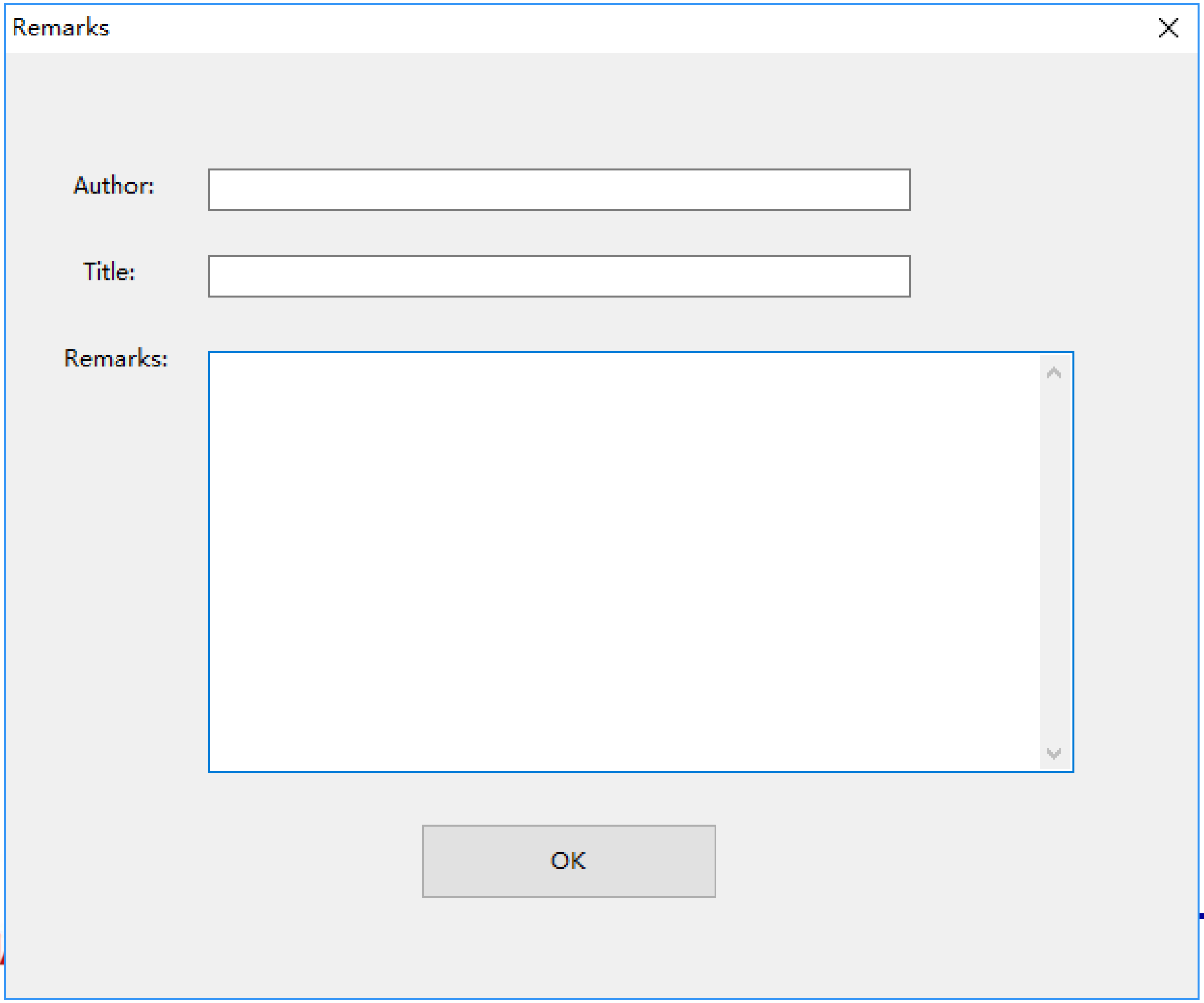
Global Environment Settings

Default curve size: 2

Default point size: 2

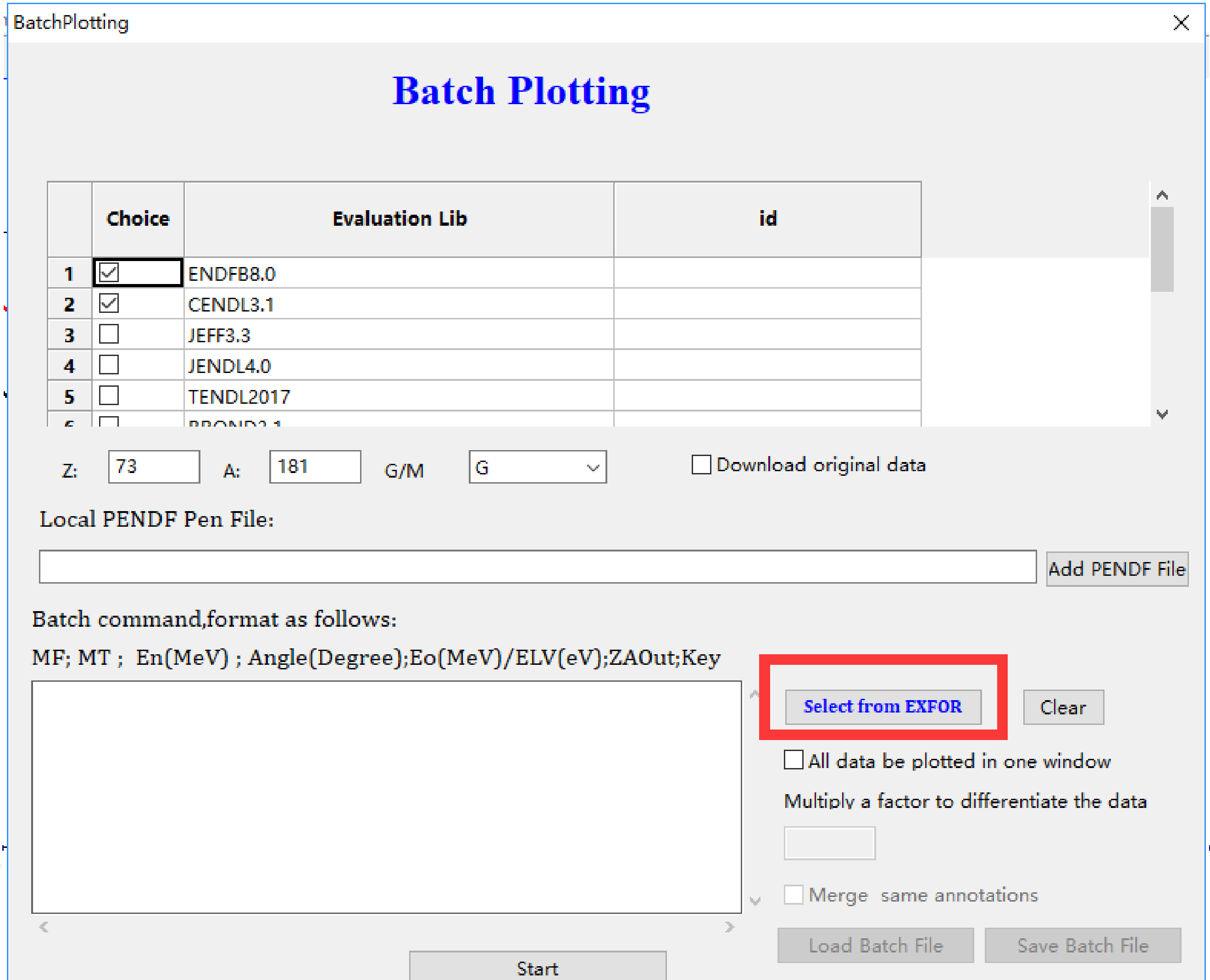
Introduction of NDPlot

- [Remarks]


Remarks
Author:
Title:
Remarks:
OK

Introduction of NDPlot

- BatchPlotting（for DA，DE，DAE）



BatchPlotting

Batch Plotting

	Choice	Evaluation Lib	id
1	☑	ENDFB8.0	
2	☑	CENDL3.1	
3	☐	JEFF3.3	
4	☐	JENDL4.0	
5	☐	TENDL2017	
6	☐		

Z: 73 A: 181 G/M G

☐ Download original data

Local PENDF Pen File:

Batch command,format as follows:

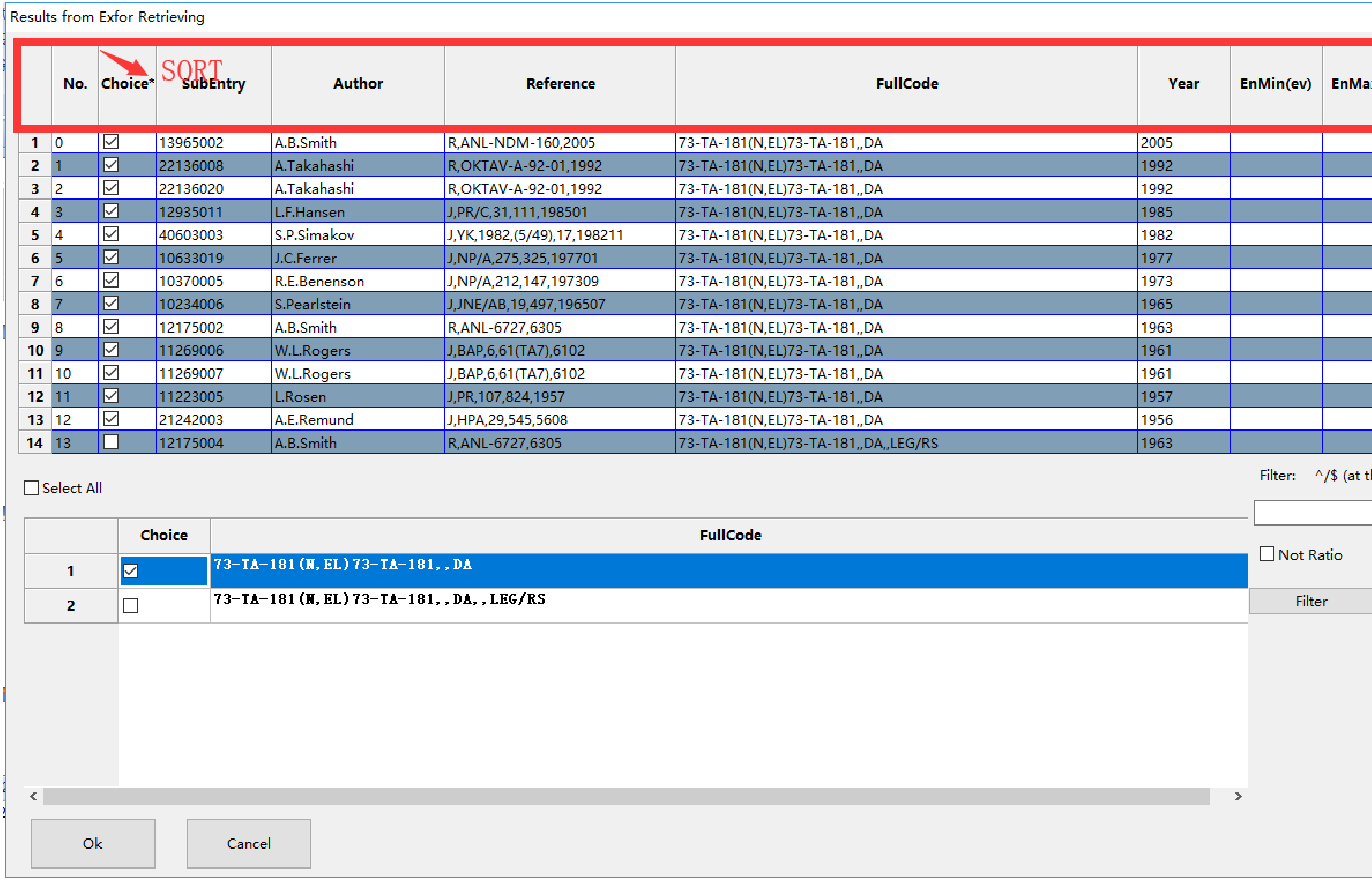
MF; MT ; En(MeV) ; Angle(Degree);Eo(MeV)/ELV(eV);ZAOut;Key

☐ All data be plotted in one window

Multiply a factor to differentiate the data

☐ Merge same annotations

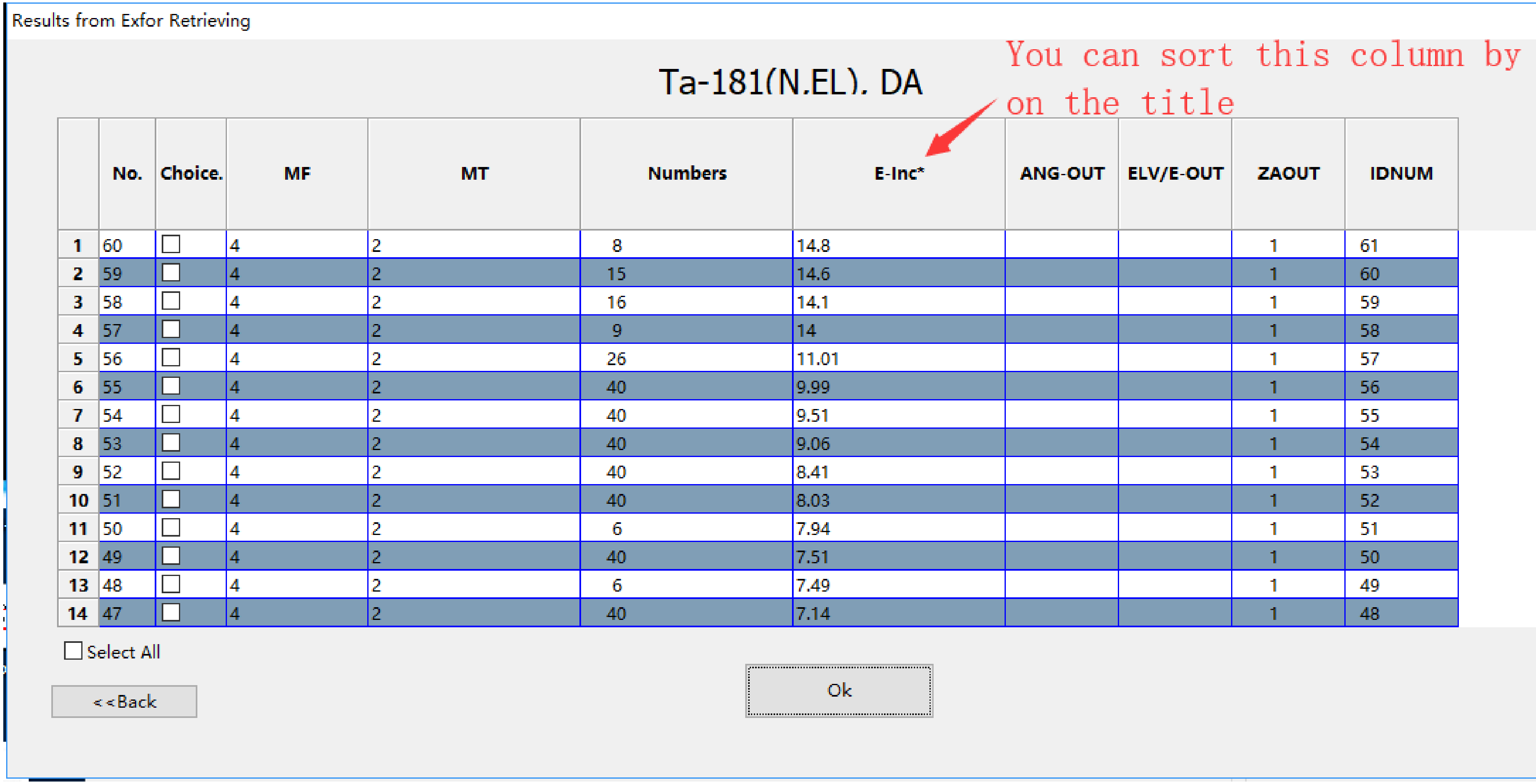
Add PENDF File
Select from EXFOR
Clear
Load Batch File
Save Batch File
Start



Results from Exfor Retrieving

	No.	Choice*	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMa
1	0	☑	13965002	A.B.Smith	R,ANL-NDM-160,2005	73-TA-181(N,EL)73-TA-181,,DA	2005		
2	1	☑	22136008	A.Takahashi	R,OKTAV-A-92-01,1992	73-TA-181(N,EL)73-TA-181,,DA	1992		
3	2	☑	22136020	A.Takahashi	R,OKTAV-A-92-01,1992	73-TA-181(N,EL)73-TA-181,,DA	1992		
4	3	☑	12935011	L.F.Hansen	J,PR/C,31,111,198501	73-TA-181(N,EL)73-TA-181,,DA	1985		
5	4	☑	40603003	S.P.Simakov	J,YK,1982,(5/49),17,198211	73-TA-181(N,EL)73-TA-181,,DA	1982		
6	5	☑	10633019	J.C.Ferrer	J,NP/A,275,325,197701	73-TA-181(N,EL)73-TA-181,,DA	1977		
7	6	☑	10370005	R.E.Benenson	J,NP/A,212,147,197309	73-TA-181(N,EL)73-TA-181,,DA	1973		
8	7	☑	10234006	S.Pearlstein	J,JNE/AB,19,497,196507	73-TA-181(N,EL)73-TA-181,,DA	1965		
9	8	☑	12175002	A.B.Smith	R,ANL-6727,6305	73-TA-181(N,EL)73-TA-181,,DA	1963		
10	9	☑	11269006	W.L.Rogers	J,BAP,6,61(TA7),6102	73-TA-181(N,EL)73-TA-181,,DA	1961		
11	10	☑	11269007	W.L.Rogers	J,BAP,6,61(TA7),6102	73-TA-181(N,EL)73-TA-181,,DA	1961		
12	11	☑	11223005	L.Rosen	J,PR,107,824,1957	73-TA-181(N,EL)73-TA-181,,DA	1957		
13	12	☑	21242003	A.E.Remund	J,HPA,29,545,5608	73-TA-181(N,EL)73-TA-181,,DA	1956		
14	13	☐	12175004	A.B.Smith	R,ANL-6727,6305	73-TA-181(N,EL)73-TA-181,,DA,,LEG/RS	1963		

	Choice	FullCode
1	☑	73-TA-181(N,EL)73-TA-181,,DA
2	☐	73-TA-181(N,EL)73-TA-181,,DA,,LEG/RS



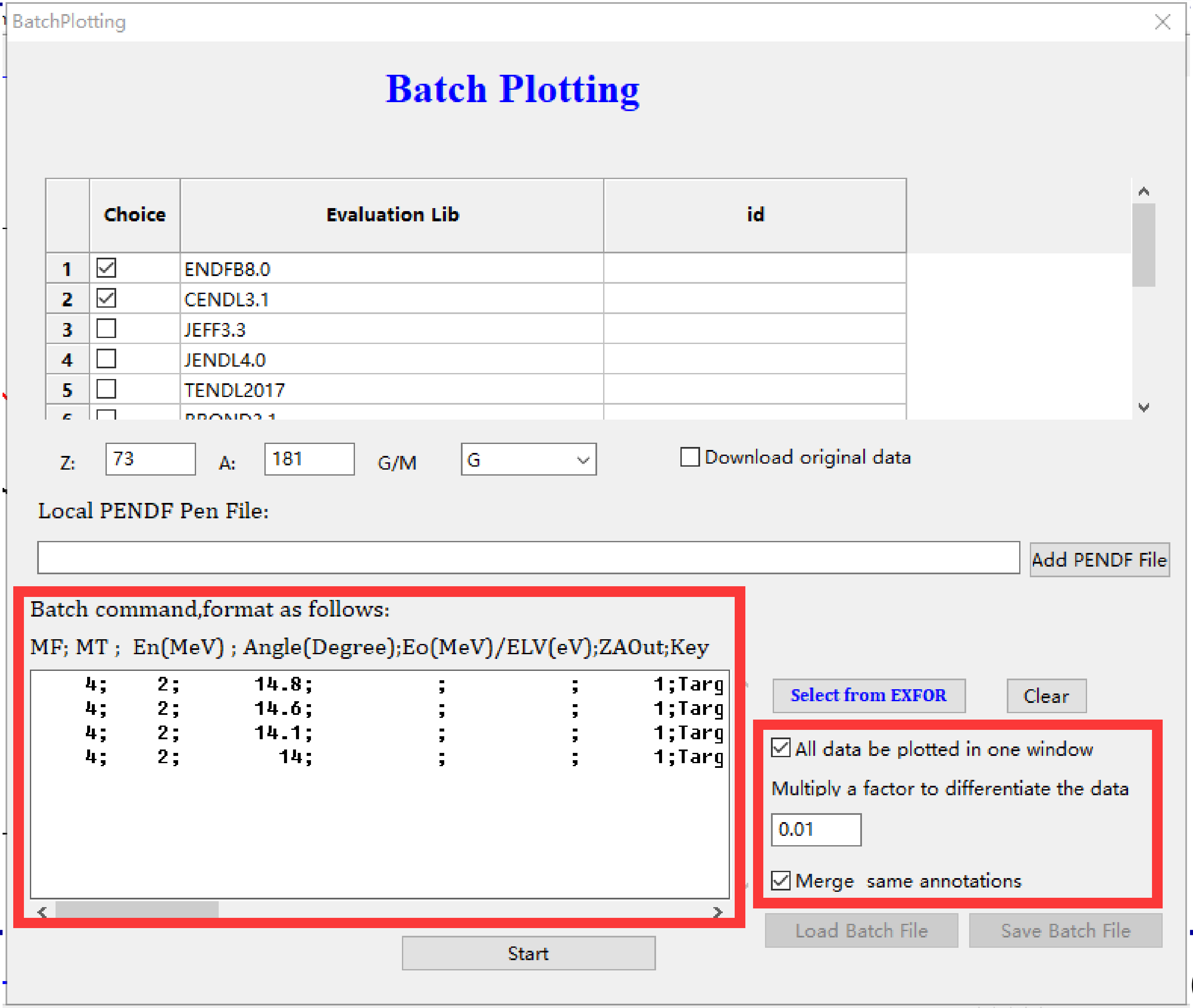
Results from Exfor Retrieving

Ta-181(N,EL), DA

You can sort this column by
on the title

	No.	Choice.	MF	MT	Numbers	E-Inc*	ANG-OUT	ELV/E-OUT	ZAOUT	IDNUM
1	60	☐	4	2	8	14.8			1	61
2	59	☐	4	2	15	14.6			1	60
3	58	☐	4	2	16	14.1			1	59
4	57	☐	4	2	9	14			1	58
5	56	☐	4	2	26	11.01			1	57
6	55	☐	4	2	40	9.99			1	56
7	54	☐	4	2	40	9.51			1	55
8	53	☐	4	2	40	9.06			1	54
9	52	☐	4	2	40	8.41			1	53
10	51	☐	4	2	40	8.03			1	52
11	50	☐	4	2	6	7.94			1	51
12	49	☐	4	2	40	7.51			1	50
13	48	☐	4	2	6	7.49			1	49
14	47	☐	4	2	40	7.14			1	48

☐ Select All


BatchPlotting

Batch Plotting

	Choice	Evaluation Lib	id
1	☑	ENDFB8.0	
2	☑	CENDL3.1	
3	☐	JEFF3.3	
4	☐	JENDL4.0	
5	☐	TENDL2017	

Z: 73 A: 181 G/M G

☐ Download original data

Local PENDF Pen File:

Add PENDF File

Batch command,format as follows:

MF; MT ; En(MeV) ; Angle(Degree);Eo(MeV)/ELV(eV);ZAOut;Key

```
    4;     2;       14.8;          ;          ;      1;Targ
    4;     2;       14.6;          ;          ;      1;Targ
    4;     2;       14.1;          ;          ;      1;Targ
    4;     2;         14;          ;          ;      1;Targ
```

Select from EXFOR
Clear

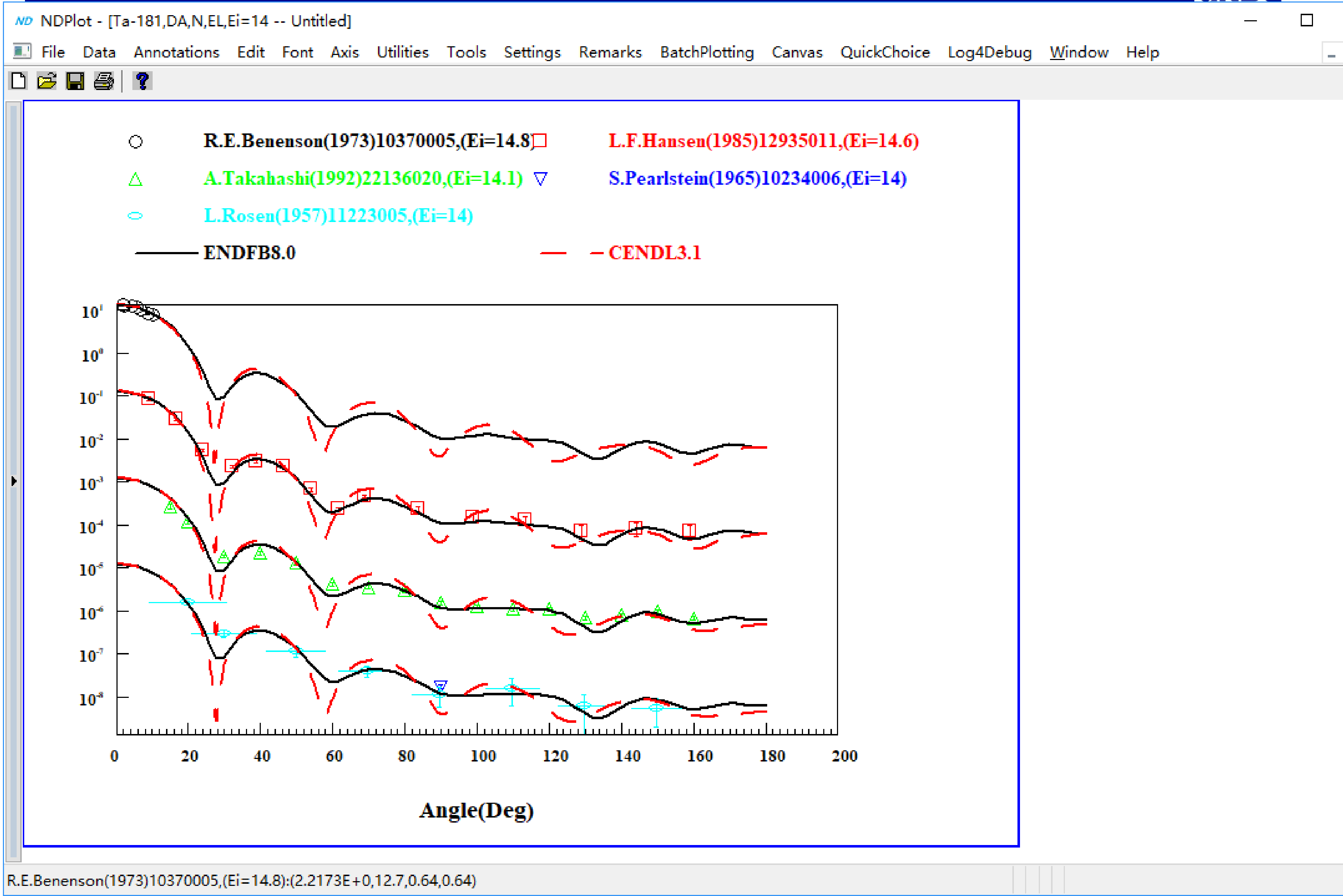
☑ All data be plotted in one window

Multiply a factor to differentiate the data

0.01

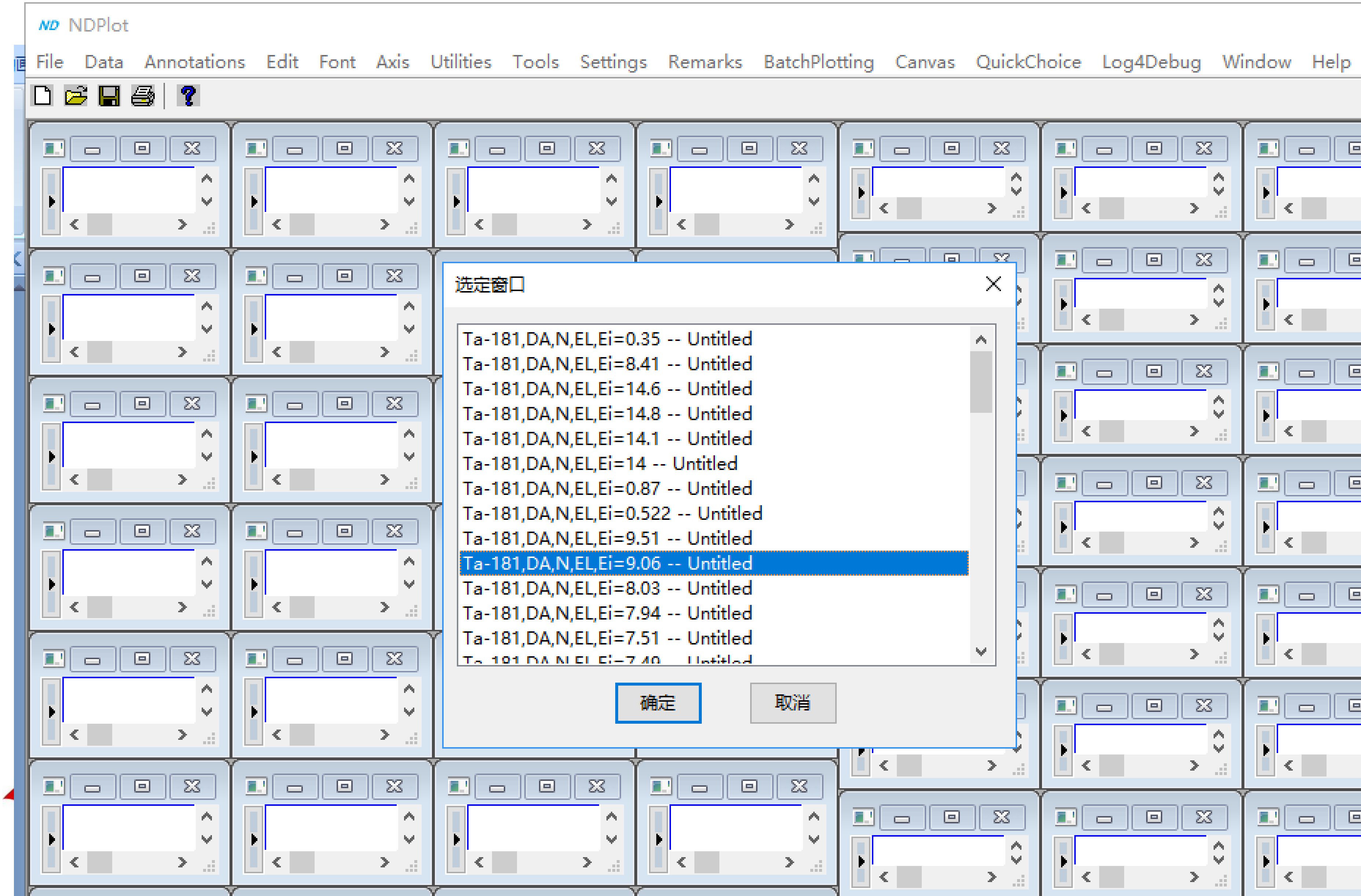
☑ Merge same annotations

Load Batch File
Save Batch File
Start


NDPlot - [Ta-181,DA,N,EL,Ei=14 -- Untitled]
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
○ R.E.Benenson(1973)10370005,(Ei=14.8)
□ L.F.Hansen(1985)12935011,(Ei=14.6)
△ A.Takahashi(1992)22136020,(Ei=14.1)
▽ S.Pearlstein(1965)10234006,(Ei=14)
⬭ L.Rosen(1957)11223005,(Ei=14)
ENDFB8.0
CENDL3.1
10^{1}
10^{0}
10^{-1}
10^{-2}
10^{-3}
10^{-4}
10^{-5}
10^{-6}
10^{-7}
10^{-8}
0
20
40
60
80
100
120
140
160
180
200
Angle(Deg)

R.E.Benenson(1973)10370005,(Ei=14.8):(2.2173E+0,12.7,0.64,0.64)

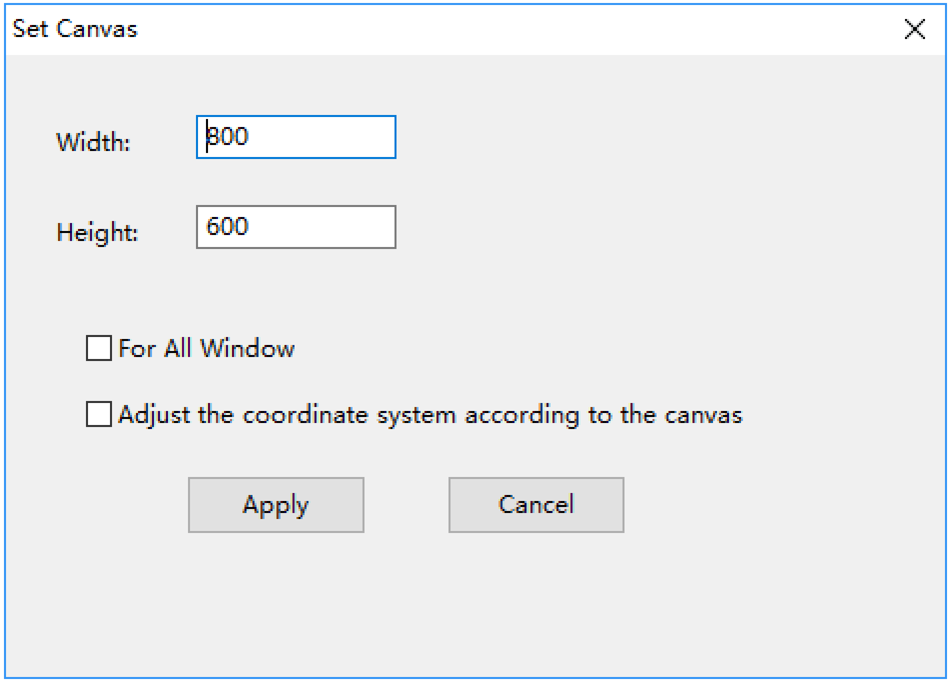
Each energy has a window


NDPlot
File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
选定窗口
确定
取消

Ta-181,DA,N,EL,Ei=0.35 -- Untitled
Ta-181,DA,N,EL,Ei=8.41 -- Untitled
Ta-181,DA,N,EL,Ei=14.6 -- Untitled
Ta-181,DA,N,EL,Ei=14.8 -- Untitled
Ta-181,DA,N,EL,Ei=14.1 -- Untitled
Ta-181,DA,N,EL,Ei=14 -- Untitled
Ta-181,DA,N,EL,Ei=0.87 -- Untitled
Ta-181,DA,N,EL,Ei=0.522 -- Untitled
Ta-181,DA,N,EL,Ei=9.51 -- Untitled
Ta-181,DA,N,EL,Ei=9.06 -- Untitled
Ta-181,DA,N,EL,Ei=8.03 -- Untitled
Ta-181,DA,N,EL,Ei=7.94 -- Untitled
Ta-181,DA,N,EL,Ei=7.51 -- Untitled
Ta-181,DA,N,EL,Ei=7.49 -- Untitled

Introduction of NDPlot

■[Canvas]



Set Canvas

Width: 800

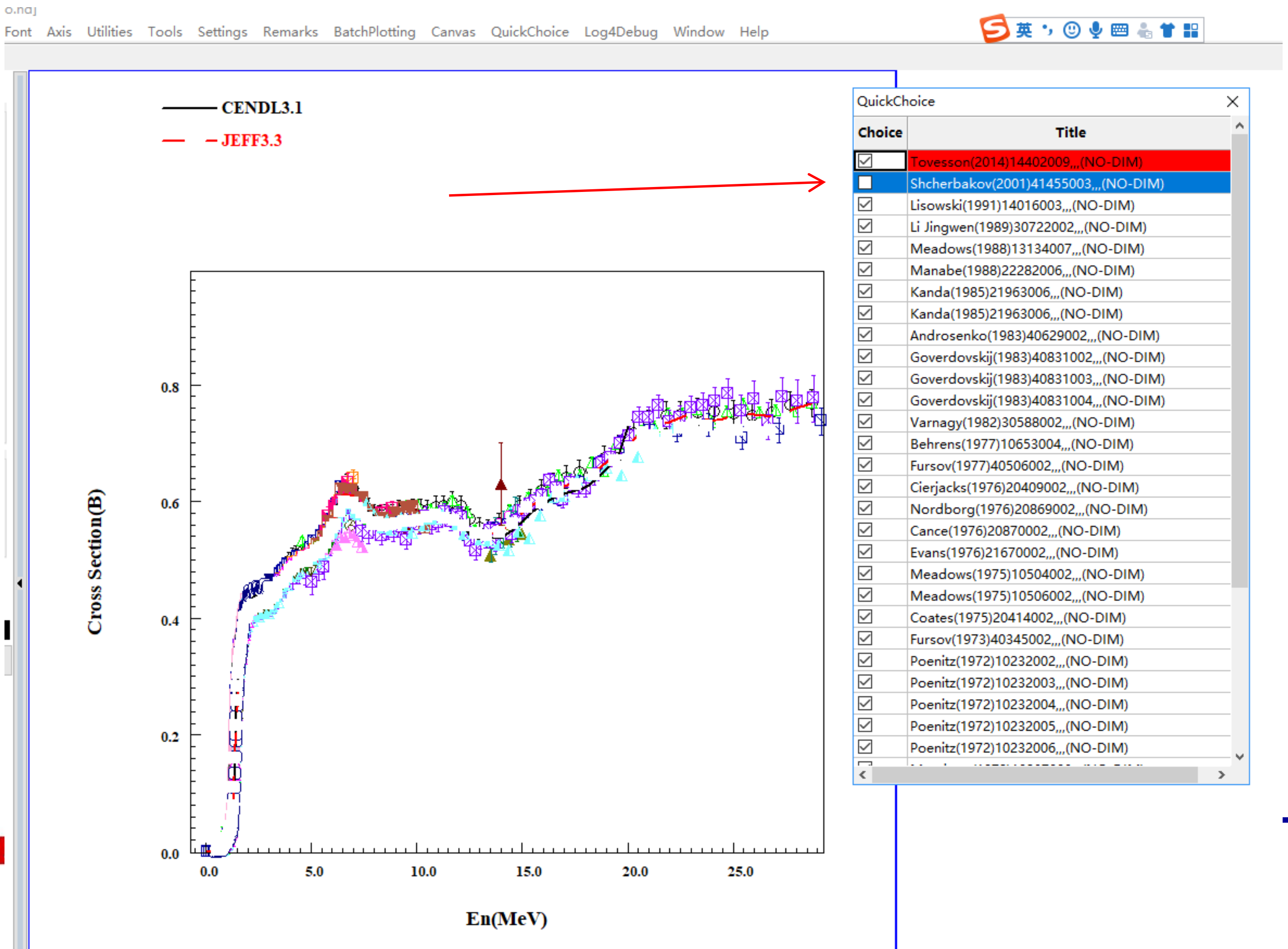
Height: 600

☐ For All Window

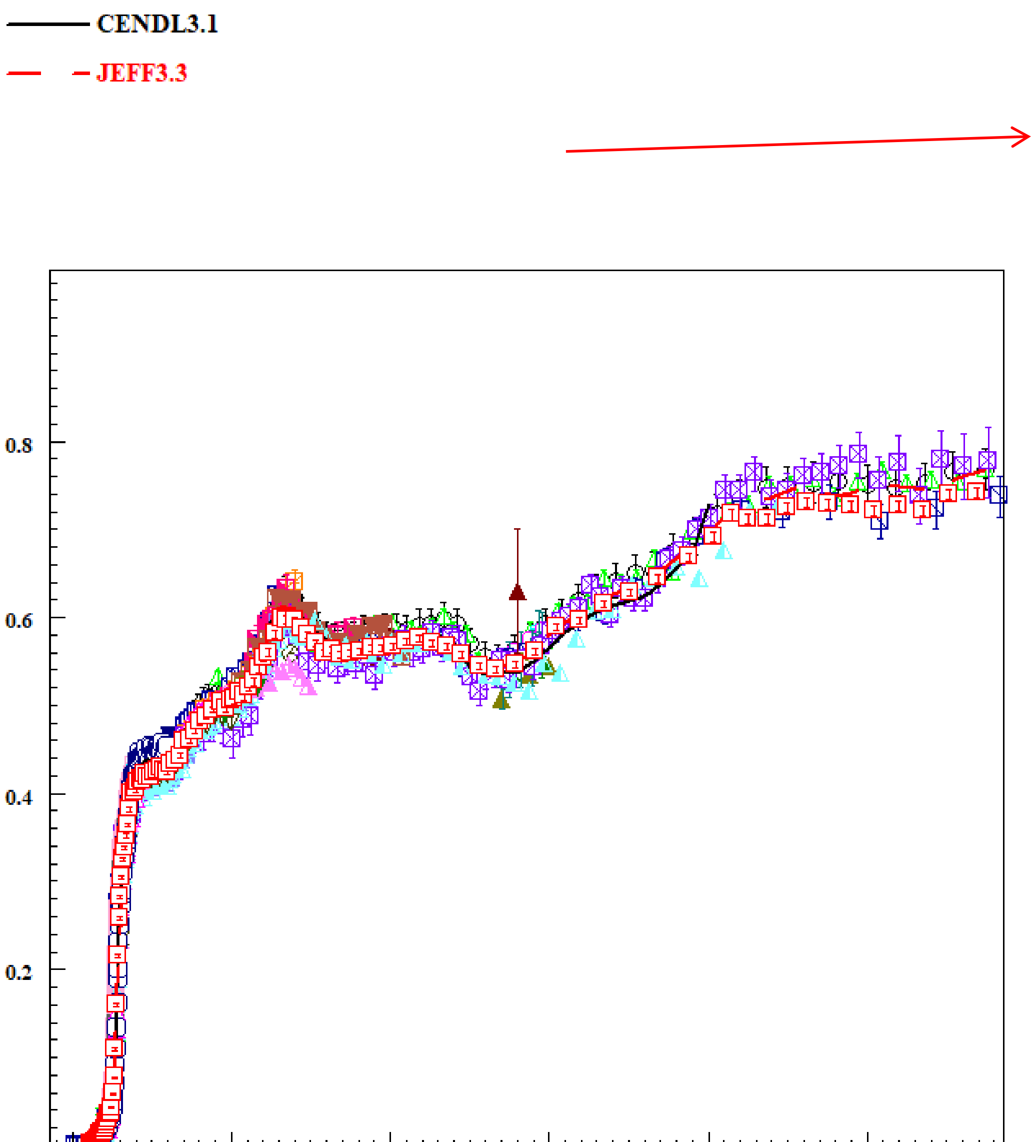
☐ Adjust the coordinate system according to the canvas

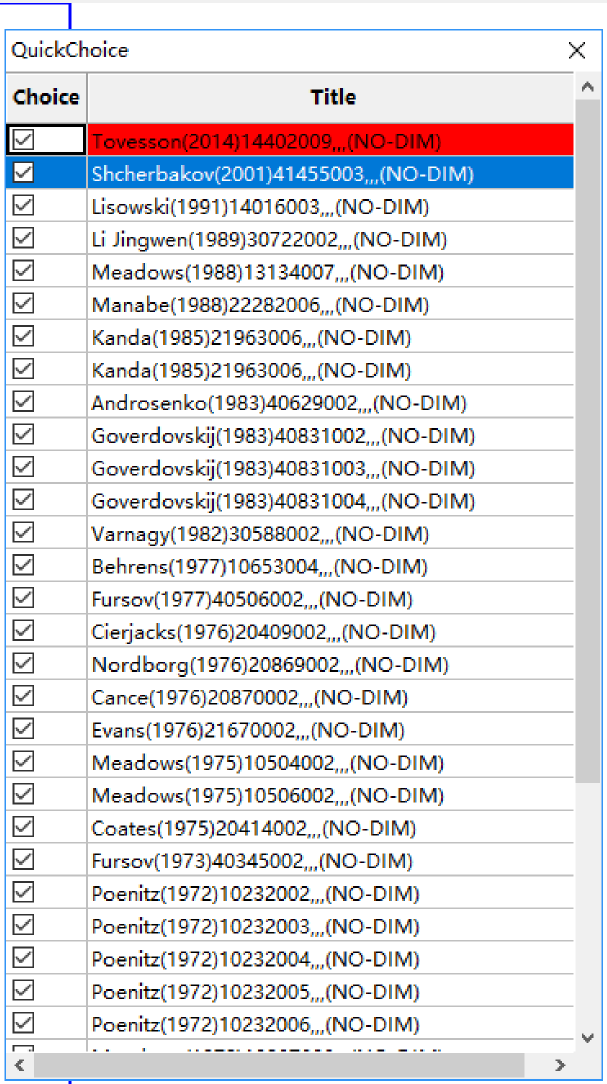
Introduction of NDPlot

■[QuickChoice]


Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
CENDL3.1
JEFF3.3
Cross Section(B)
0.0
0.2
0.4
0.6
0.8
0.0
5.0
10.0
15.0
20.0
25.0
En(MeV)
QuickChoice

Choice	Title
☑	Tovesson(2014)14402009,,,(NO-DIM)
☐	Shcherbakov(2001)41455003,,,(NO-DIM)
☑	Lisowski(1991)14016003,,,(NO-DIM)
☑	Li Jingwen(1989)30722002,,,(NO-DIM)
☑	Meadows(1988)13134007,,,(NO-DIM)
☑	Manabe(1988)22282006,,,(NO-DIM)
☑	Kanda(1985)21963006,,,(NO-DIM)
☑	Kanda(1985)21963006,,,(NO-DIM)
☑	Androsenko(1983)40629002,,,(NO-DIM)
☑	Goverdovskij(1983)40831002,,,(NO-DIM)
☑	Goverdovskij(1983)40831003,,,(NO-DIM)
☑	Goverdovskij(1983)40831004,,,(NO-DIM)
☑	Varnagy(1982)30588002,,,(NO-DIM)
☑	Behrens(1977)10653004,,,(NO-DIM)
☑	Fursov(1977)40506002,,,(NO-DIM)
☑	Cierjacks(1976)20409002,,,(NO-DIM)
☑	Nordborg(1976)20869002,,,(NO-DIM)
☑	Cance(1976)20870002,,,(NO-DIM)
☑	Evans(1976)21670002,,,(NO-DIM)
☑	Meadows(1975)10504002,,,(NO-DIM)
☑	Meadows(1975)10506002,,,(NO-DIM)
☑	Coates(1975)20414002,,,(NO-DIM)
☑	Fursov(1973)40345002,,,(NO-DIM)
☑	Poenitz(1972)10232002,,,(NO-DIM)
☑	Poenitz(1972)10232003,,,(NO-DIM)
☑	Poenitz(1972)10232004,,,(NO-DIM)
☑	Poenitz(1972)10232005,,,(NO-DIM)
☑	Poenitz(1972)10232006,,,(NO-DIM)

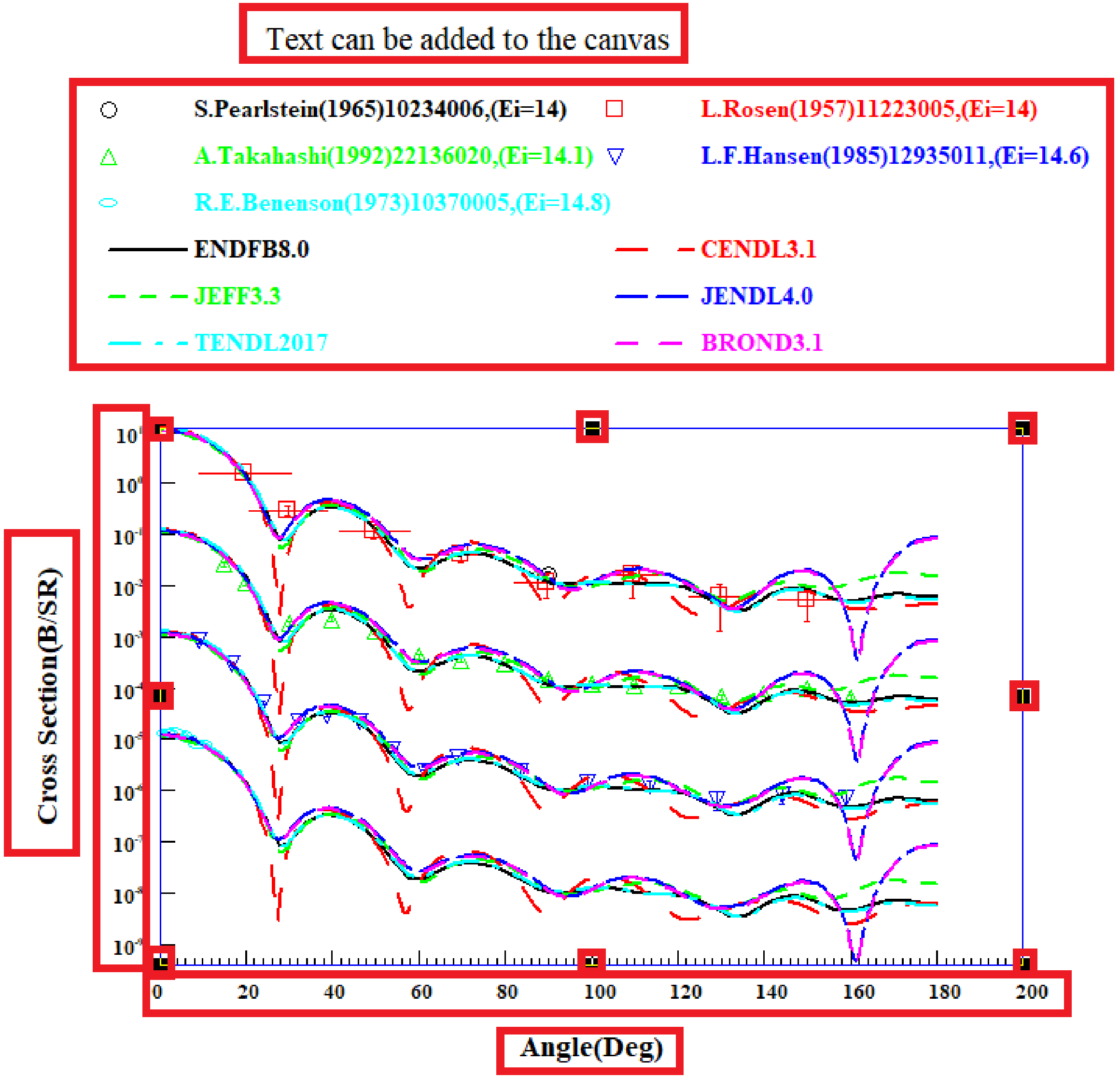




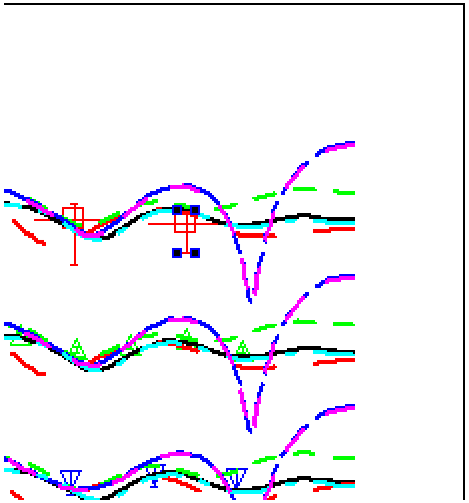
Choice	Title
☑	Tovesson(2014)14402009,,,(NO-DIM)
☑	Shcherbakov(2001)41455003,,,(NO-DIM)
☑	Lisowski(1991)14016003,,,(NO-DIM)
☑	Li Jingwen(1989)30722002,,,(NO-DIM)
☑	Meadows(1988)13134007,,,(NO-DIM)
☑	Manabe(1988)22282006,,,(NO-DIM)
☑	Kanda(1985)21963006,,,(NO-DIM)
☑	Kanda(1985)21963006,,,(NO-DIM)
☑	Androsenko(1983)40629002,,,(NO-DIM)
☑	Goverdovskij(1983)40831002,,,(NO-DIM)
☑	Goverdovskij(1983)40831003,,,(NO-DIM)
☑	Goverdovskij(1983)40831004,,,(NO-DIM)
☑	Varnagy(1982)30588002,,,(NO-DIM)
☑	Behrens(1977)10653004,,,(NO-DIM)
☑	Fursov(1977)40506002,,,(NO-DIM)
☑	Cierjacks(1976)20409002,,,(NO-DIM)
☑	Nordborg(1976)20869002,,,(NO-DIM)
☑	Cance(1976)20870002,,,(NO-DIM)
☑	Evans(1976)21670002,,,(NO-DIM)
☑	Meadows(1975)10504002,,,(NO-DIM)
☑	Meadows(1975)10506002,,,(NO-DIM)
☑	Coates(1975)20414002,,,(NO-DIM)
☑	Fursov(1973)40345002,,,(NO-DIM)
☑	Poenitz(1972)10232002,,,(NO-DIM)
☑	Poenitz(1972)10232003,,,(NO-DIM)
☑	Poenitz(1972)10232004,,,(NO-DIM)
☑	Poenitz(1972)10232005,,,(NO-DIM)
☑	Poenitz(1972)10232006,,,(NO-DIM)

Introduction of NDPlot

■Click/(Double Click) On Canvas

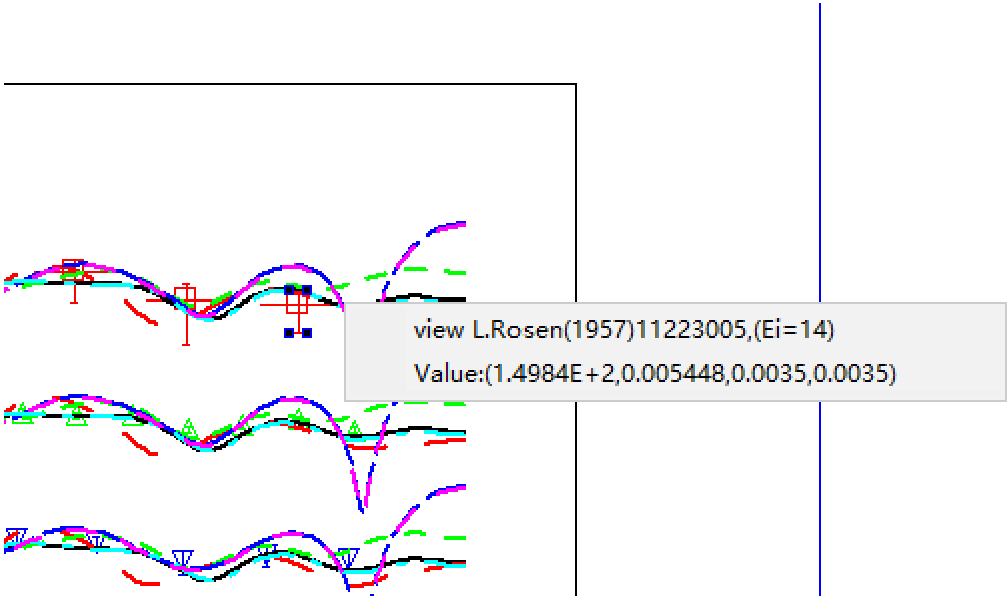

Text can be added to the canvas
○ S.Pearlstein(1965)10234006,(Ei=14)
□ L.Rosen(1957)11223005,(Ei=14)
△ A.Takahashi(1992)22136020,(Ei=14.1)
▽ L.F.Hansen(1985)12935011,(Ei=14.6)
⬭ R.E.Benenson(1973)10370005,(Ei=14.8)
ENDFB8.0
CENDL3.1
JEFF3.3
JENDL4.0
TENDL2017
BROND3.1
10^1
10^0
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
10^-9
Cross Section(B/SR)
0
20
40
60
80
100
120
140
160
180
200
Angle(Deg)

Click/Exp. Data Point



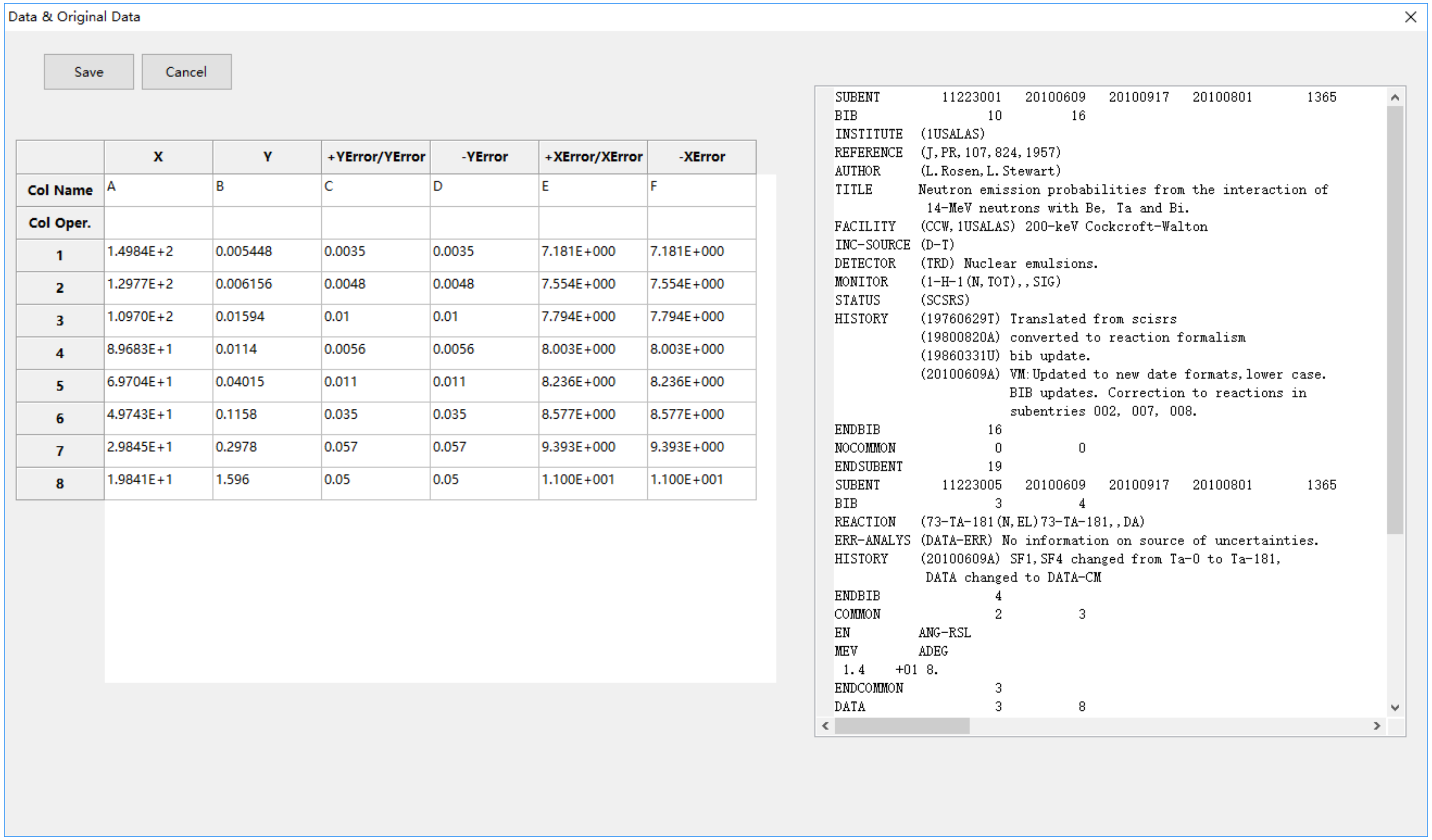
Click the Exp. Point(Left Button of Mouse)

Popup Menu(Right Button of Mouse Clicks)



view L.Rosen(1957)11223005,(Ei=14)

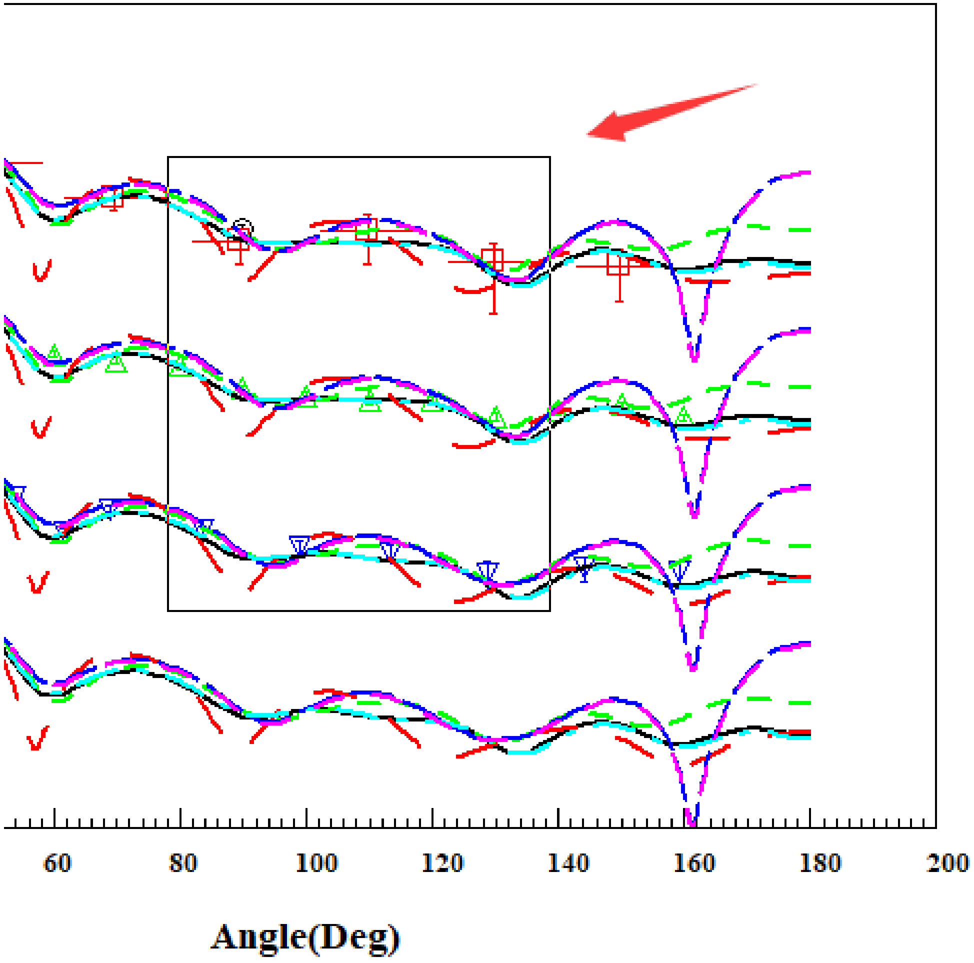
Value:(1.4984E+2,0.005448,0.0035,0.0035)

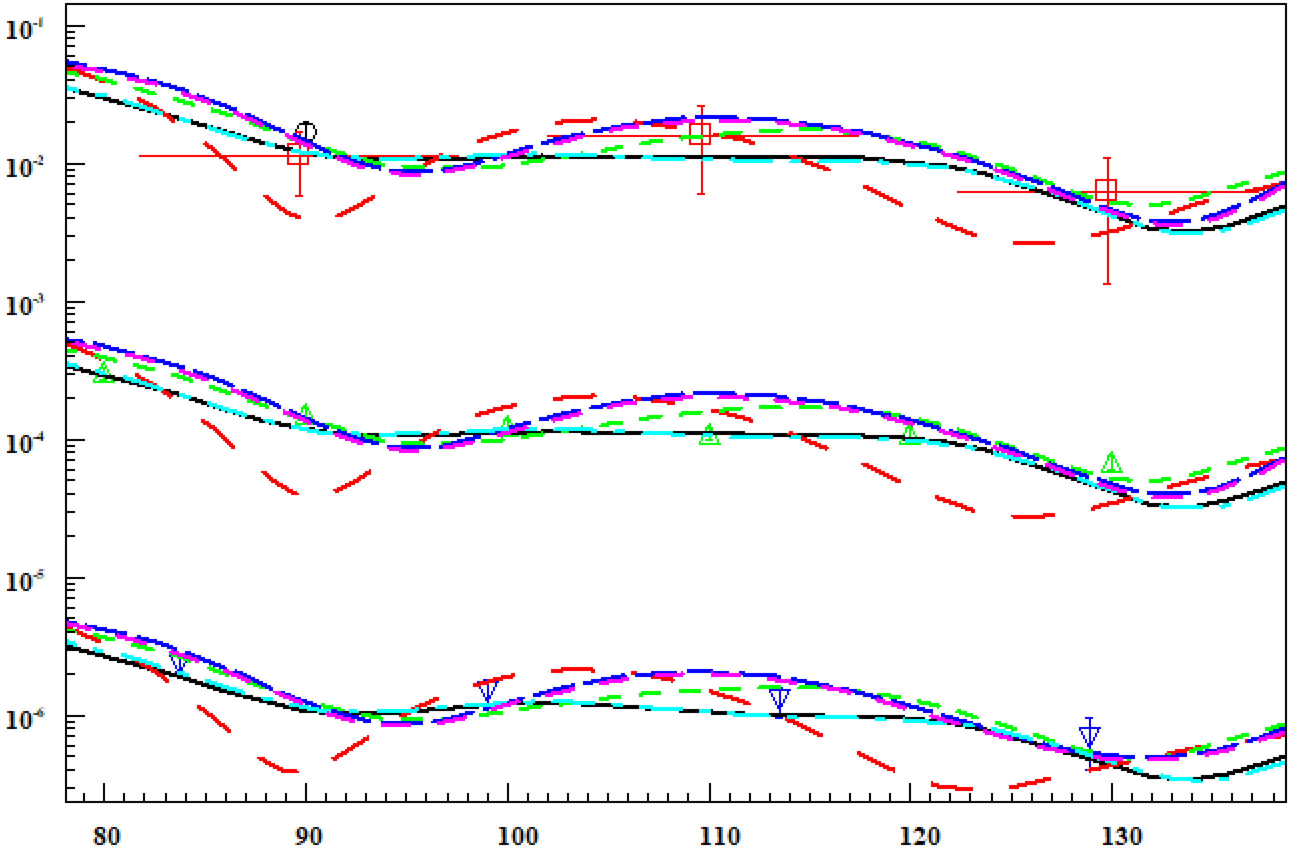


	X	Y	+YError/YError	-YError	+XError/XError	-XError
Col Name	A	B	C	D	E	F
Col Oper.						
1	1.4984E+2	0.005448	0.0035	0.0035	7.181E+000	7.181E+000
2	1.2977E+2	0.006156	0.0048	0.0048	7.554E+000	7.554E+000
3	1.0970E+2	0.01594	0.01	0.01	7.794E+000	7.794E+000
4	8.9683E+1	0.0114	0.0056	0.0056	8.003E+000	8.003E+000
5	6.9704E+1	0.04015	0.011	0.011	8.236E+000	8.236E+000
6	4.9743E+1	0.1158	0.035	0.035	8.577E+000	8.577E+000
7	2.9845E+1	0.2978	0.057	0.057	9.393E+000	9.393E+000
8	1.9841E+1	1.596	0.05	0.05	1.100E+001	1.100E+001

```
SUBENT        11223001   20100609   20100917   20100801       1365
BIB                 10         16
INSTITUTE  (1USALAS)
REFERENCE  (J,PR,107,824,1957)
AUTHOR     (L.Rosen,L.Stewart)
TITLE      Neutron emission probabilities from the interaction of
            14-MeV neutrons with Be, Ta and Bi.
FACILITY   (CCW,1USALAS) 200-keV Cockcroft-Walton
INC-SOURCE (D-T)
DETECTOR   (TRD) Nuclear emulsions.
MONITOR    (1-H-1(N,TOT),,SIG)
STATUS     (SCSRS)
HISTORY    (19760629T) Translated from scisrs
           (19800820A) converted to reaction formalism
           (19860331U) bib update.
           (20100609A) VM:Updated to new date formats,lower case.
                       BIB updates. Correction to reactions in
                       subentries 002, 007, 008.
ENDBIB              16
NOCOMMON             0          0
ENDSUBENT           19
SUBENT        11223005   20100609   20100917   20100801       1365
BIB                  3          4
REACTION   (73-TA-181(N,EL)73-TA-181,,DA)
ERR-ANALYS (DATA-ERR) No information on source of uncertainties.
HISTORY    (20100609A) SF1,SF4 changed from Ta-0 to Ta-181,
            DATA changed to DATA-CM
ENDBIB               4
COMMON               2          3
EN         ANG-RSL
MEV        ADEG
 1.4   +01 8.
ENDCOMMON            3
DATA                 3          8
```

Display local area




10⁻¹
10⁻²
10⁻³
10⁻⁴
10⁻⁵
10⁻⁶
80
90
100
110
120
130

Contents

- Introduction of NDPlot
- Visualization of Fission Product Yield
- Summary

Visualization of Fission Product Yield

There are two kinds of visualization that need to be solved urgently

Chain Yield

Yield Energy Independence

process the data manually

Very inefficient

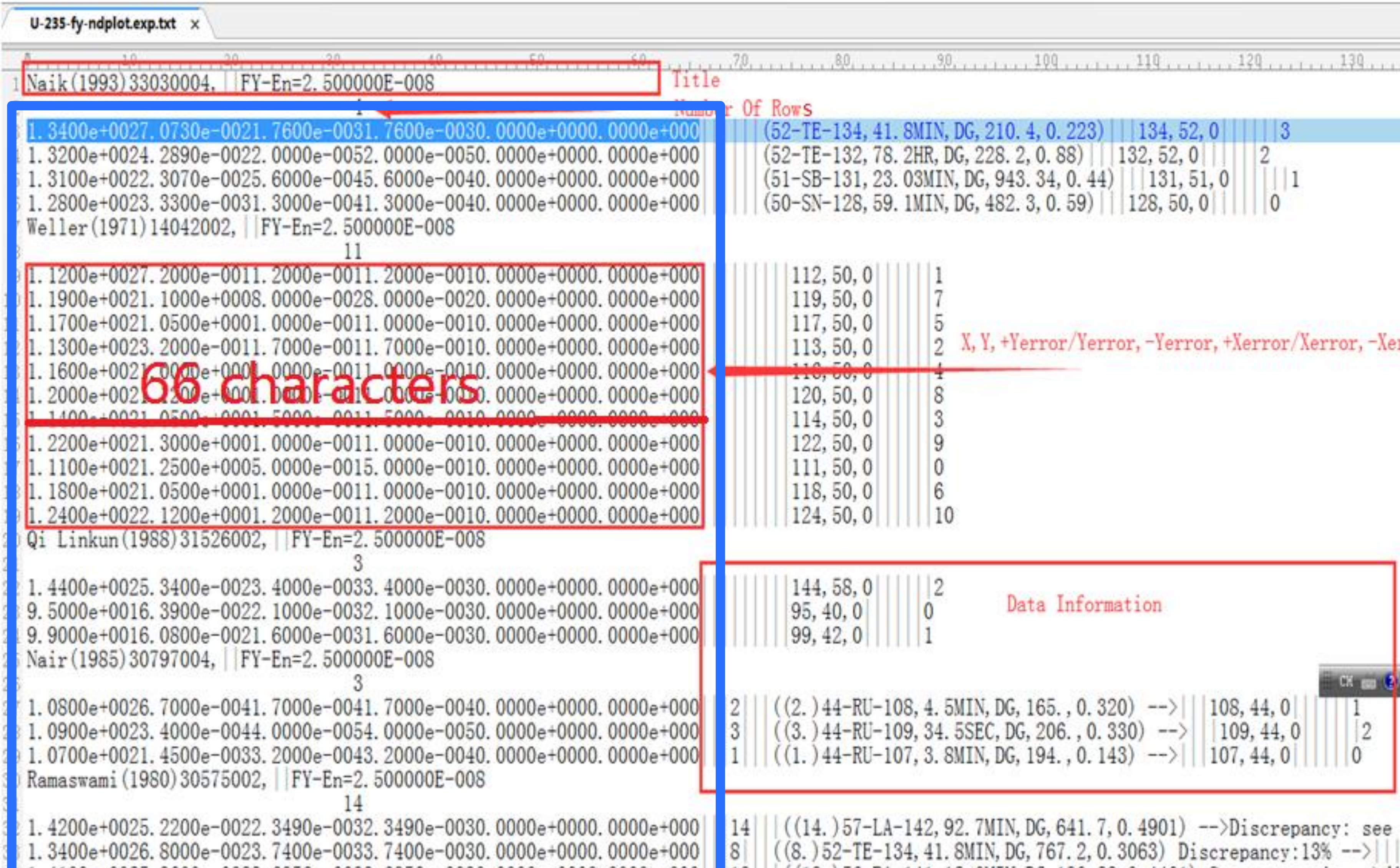
Visualization of Fission Product Yield

Evaluated Data:
MF=8,MT=454,459

Exp. Data
FY(CUM,IND,CHN)

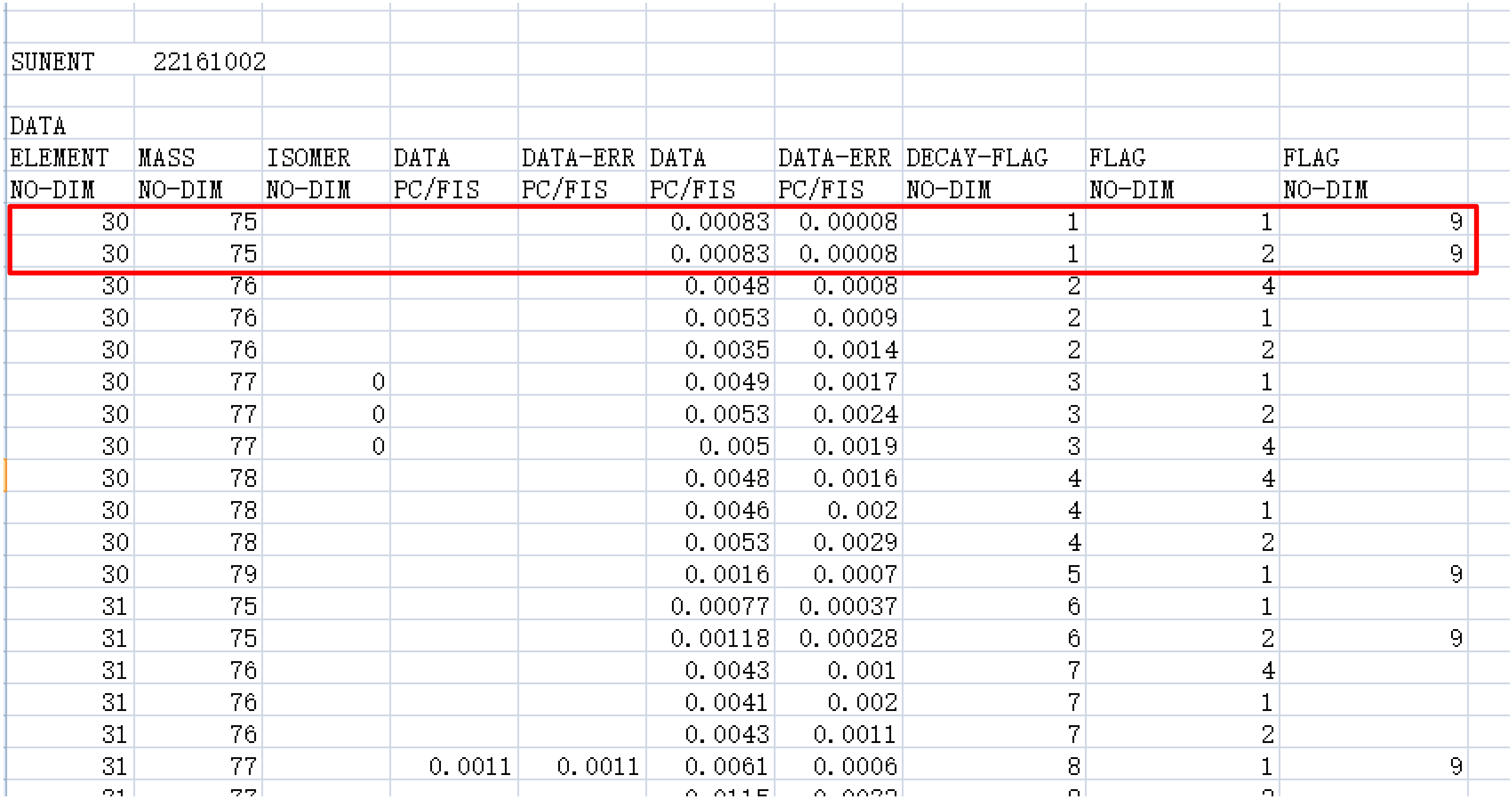
Visualization of Fission Product Yield

Experimental Data of Fission Product need more complex structures


U-235-fy-ndplot.exp.txt ×
Title
Number Of Rows
66 characters
X, Y, +Yerror/Yerror, -Yerror, +Xerror/Xerror, -Xe
Data Information

```
Naik(1993)33030004,  FY-En=2.500000E-008
                                1
1.3400e+0027.0730e-0021.7600e-0031.7600e-0030.0000e+0000.0000e+000        (52-TE-134,41.8MIN,DG,210.4,0.223)   134,52,0     3
1.3200e+0024.2890e-0022.0000e-0052.0000e-0050.0000e+0000.0000e+000        (52-TE-132,78.2HR,DG,228.2,0.88)   132,52,0     2
1.3100e+0022.3070e-0025.6000e-0045.6000e-0040.0000e+0000.0000e+000        (51-SB-131,23.03MIN,DG,943.34,0.44)   131,51,0     1
1.2800e+0023.3300e-0031.3000e-0041.3000e-0040.0000e+0000.0000e+000        (50-SN-128,59.1MIN,DG,482.3,0.59)   128,50,0     0
Weller(1971)14042002,  FY-En=2.500000E-008
                                11
1.1200e+0027.2000e-0011.2000e-0011.2000e-0010.0000e+0000.0000e+000          112,50,0     1
1.1900e+0021.1000e+0008.0000e-0028.0000e-0020.0000e+0000.0000e+000          119,50,0     7
1.1700e+0021.0500e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          117,50,0     5
1.1300e+0023.2000e-0011.7000e-0011.7000e-0010.0000e+0000.0000e+000          113,50,0     2
1.1600e+0021.0000e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          116,50,0     4
1.2000e+0021.2000e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          120,50,0     8
1.1400e+0021.0500e+0001.5000e-0011.5000e-0010.0000e+0000.0000e+000          114,50,0     3
1.2200e+0021.3000e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          122,50,0     9
1.1100e+0021.2500e+0005.0000e-0015.0000e-0010.0000e+0000.0000e+000          111,50,0     0
1.1800e+0021.0500e+0001.0000e-0011.0000e-0010.0000e+0000.0000e+000          118,50,0     6
1.2400e+0022.1200e+0001.2000e-0011.2000e-0010.0000e+0000.0000e+000          124,50,0     10
Qi Linkun(1988)31526002,  FY-En=2.500000E-008
                                3
1.4400e+0025.3400e-0023.4000e-0033.4000e-0030.0000e+0000.0000e+000          144,58,0     2
9.5000e+0016.3900e-0022.1000e-0032.1000e-0030.0000e+0000.0000e+000          95,40,0     0
9.9000e+0016.0800e-0021.6000e-0031.6000e-0030.0000e+0000.0000e+000          99,42,0     1
Nair(1985)30797004,  FY-En=2.500000E-008
                                3
1.0800e+0026.7000e-0041.7000e-0041.7000e-0040.0000e+0000.0000e+000   2   ((2.)44-RU-108,4.5MIN,DG,165.,0.320) -->   108,44,0     1
1.0900e+0023.4000e-0044.0000e-0054.0000e-0050.0000e+0000.0000e+000   3   ((3.)44-RU-109,34.5SEC,DG,206.,0.330) -->   109,44,0     2
1.0700e+0021.4500e-0033.2000e-0043.2000e-0040.0000e+0000.0000e+000   1   ((1.)44-RU-107,3.8MIN,DG,194.,0.143) -->   107,44,0     0
Ramaswami(1980)30575002,  FY-En=2.500000E-008
                                14
1.4200e+0025.2200e-0022.3490e-0032.3490e-0030.0000e+0000.0000e+000   14   ((14.)57-LA-142,92.7MIN,DG,641.7,0.4901) -->Discrepancy: see
1.3400e+0026.8000e-0023.7400e-0033.7400e-0030.0000e+0000.0000e+000   8   ((8.)52-TE-134,41.8MIN,DG,767.2,0.3063) Discrepancy:13% -->
```

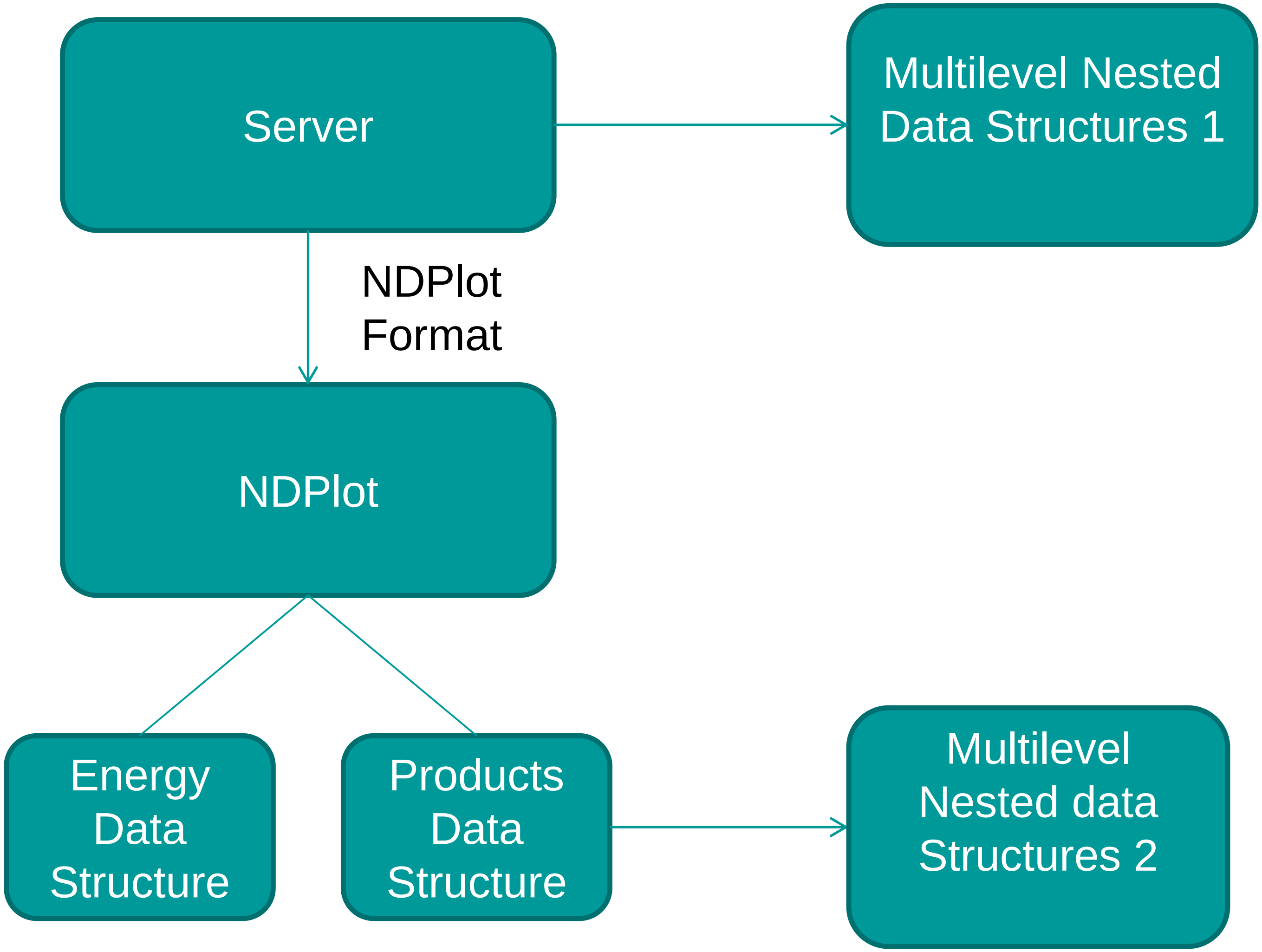
Visualization of Fission Product Yield



SUNENT 22161002

DATA									
ELEMENT	MASS	ISOMER	DATA	DATA-ERR	DATA	DATA-ERR	DECAY-FLAG	FLAG	FLAG
NO-DIM	NO-DIM	NO-DIM	PC/FIS	PC/FIS	PC/FIS	PC/FIS	NO-DIM	NO-DIM	NO-DIM
30	75				0.00083	0.00008	1	1	9
30	75				0.00083	0.00008	1	2	9
30	76				0.0048	0.0008	2	4	
30	76				0.0053	0.0009	2	1	
30	76				0.0035	0.0014	2	2	
30	77	0			0.0049	0.0017	3	1	
30	77	0			0.0053	0.0024	3	2	
30	77	0			0.005	0.0019	3	4	
30	78				0.0048	0.0016	4	4	
30	78				0.0046	0.002	4	1	
30	78				0.0053	0.0029	4	2	
30	79				0.0016	0.0007	5	1	9
31	75				0.00077	0.00037	6	1	
31	75				0.00118	0.00028	6	2	9
31	76				0.0043	0.001	7	4	
31	76				0.0041	0.002	7	1	
31	76				0.0043	0.0011	7	2	
31	77		0.0011	0.0011	0.0061	0.0006	8	1	9

Visualization of Fission Product Yield



Server

Multilevel Nested Data Structures 1

NDPlot Format

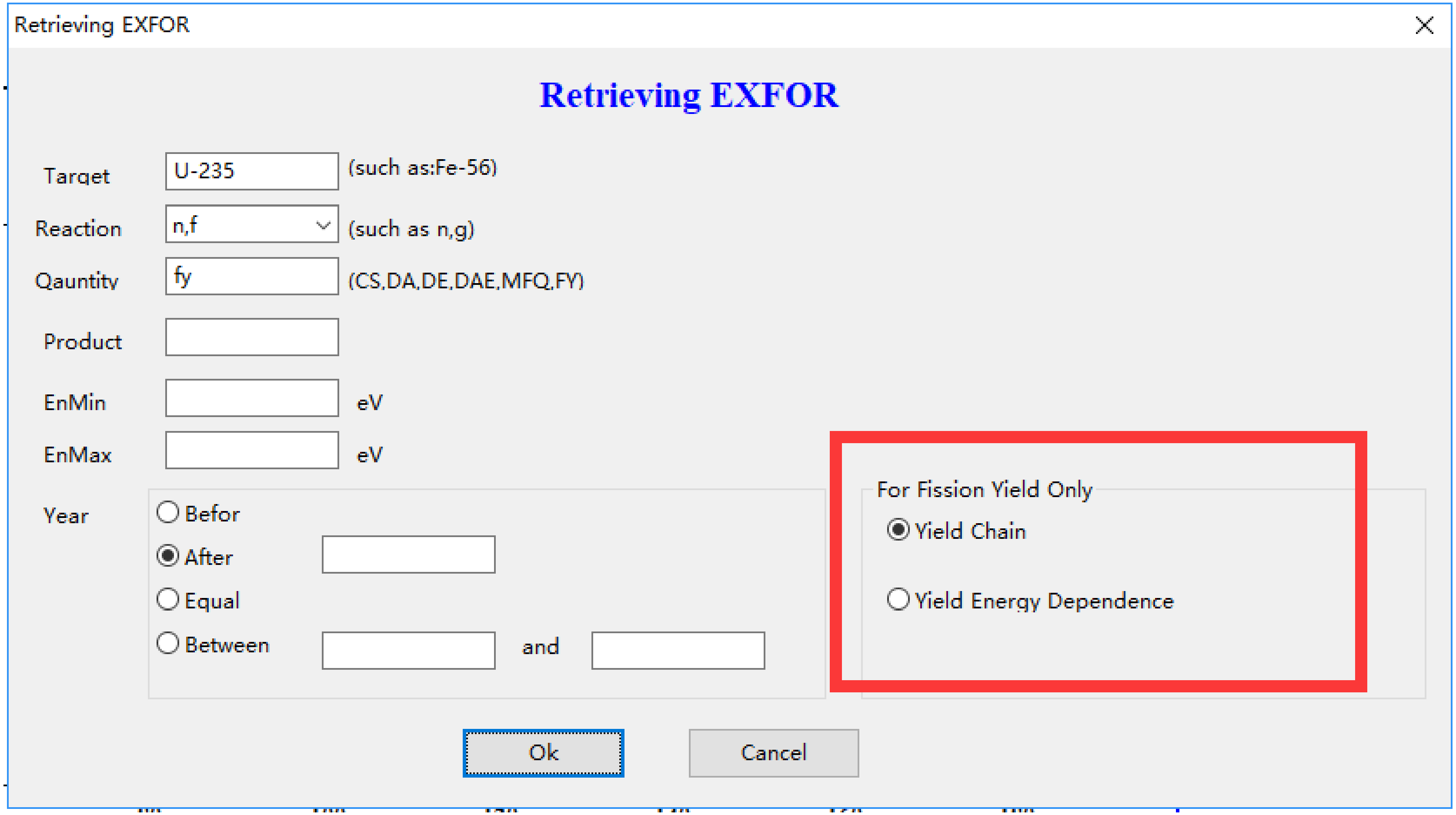
NDPlot

Energy Data Structure

Products Data Structure

Multilevel Nested data Structures 2

Demonstrations：Chain Yield



Retrieving EXFOR

Retrieving EXFOR

Target: U-235 (such as:Fe-56)

Reaction: n,f (such as n,g)

Qauntity: fy (CS,DA,DE,DAE,MFQ,FY)

Product:

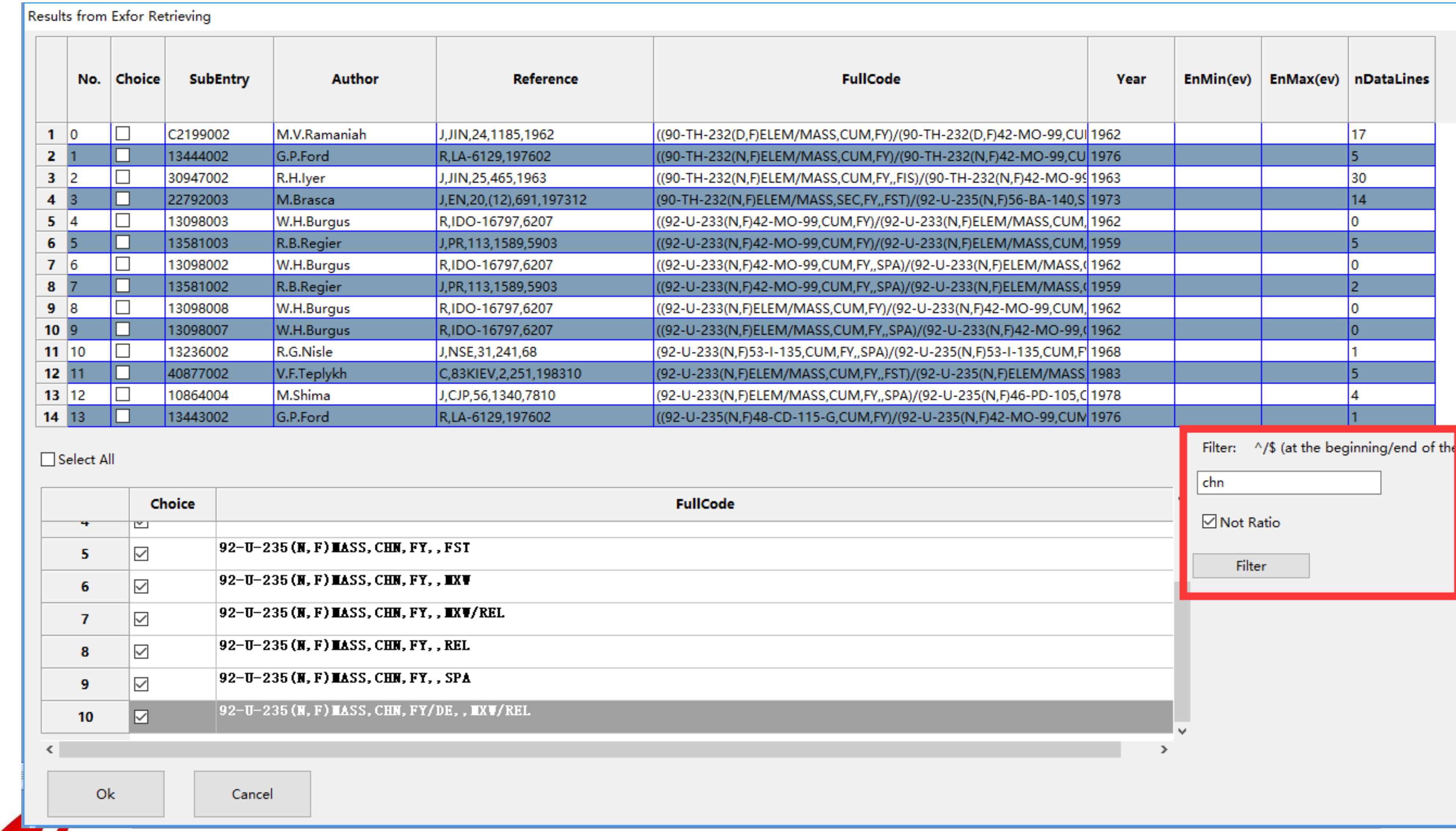
EnMin: eV

EnMax: eV

Year:
- ○ Befor
- ● After
- ○ Equal
- ○ Between and

For Fission Yield Only
- ● Yield Chain
- ○ Yield Energy Dependence

Demonstrations：Chain Yield



Results from Exfor Retrieving

	No.	Choice	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMax(ev)	nDataLines
1	0	☐	C2199002	M.V.Ramaniah	J,JIN,24,1185,1962	((90-TH-232(D,F)ELEM/MASS,CUM,FY)/(90-TH-232(D,F)42-MO-99,CU	1962			17
2	1	☐	13444002	G.P.Ford	R,LA-6129,197602	((90-TH-232(N,F)ELEM/MASS,CUM,FY)/(90-TH-232(N,F)42-MO-99,CU	1976			5
3	2	☐	30947002	R.H.Iyer	J,JIN,25,465,1963	((90-TH-232(N,F)ELEM/MASS,CUM,FY,,FIS)/(90-TH-232(N,F)42-MO-9	1963			30
4	3	☐	22792003	M.Brasca	J,EN,20,(12),691,197312	(90-TH-232(N,F)ELEM/MASS,SEC,FY,,FST)/(92-U-235(N,F)56-BA-140,S	1973			14
5	4	☐	13098003	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1962			0
6	5	☐	13581003	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1959			5
7	6	☐	13098002	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1962			0
8	7	☐	13581002	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1959			2
9	8	☐	13098008	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY)/(92-U-233(N,F)42-MO-99,CUM,	1962			0
10	9	☐	13098007	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-233(N,F)42-MO-99,	1962			0
11	10	☐	13236002	R.G.Nisle	J,NSE,31,241,68	(92-U-233(N,F)53-I-135,CUM,FY,,SPA)/(92-U-235(N,F)53-I-135,CUM,F	1968			1
12	11	☐	40877002	V.F.Teplykh	C,83KIEV,2,251,198310	(92-U-233(N,F)ELEM/MASS,CUM,FY,,FST)/(92-U-235(N,F)ELEM/MASS,	1983			5
13	12	☐	10864004	M.Shima	J,CJP,56,1340,7810	(92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-235(N,F)46-PD-105,	1978			4
14	13	☐	13443002	G.P.Ford	R,LA-6129,197602	((92-U-235(N,F)48-CD-115-G,CUM,FY)/(92-U-235(N,F)42-MO-99,CUM	1976			1

☐ Select All

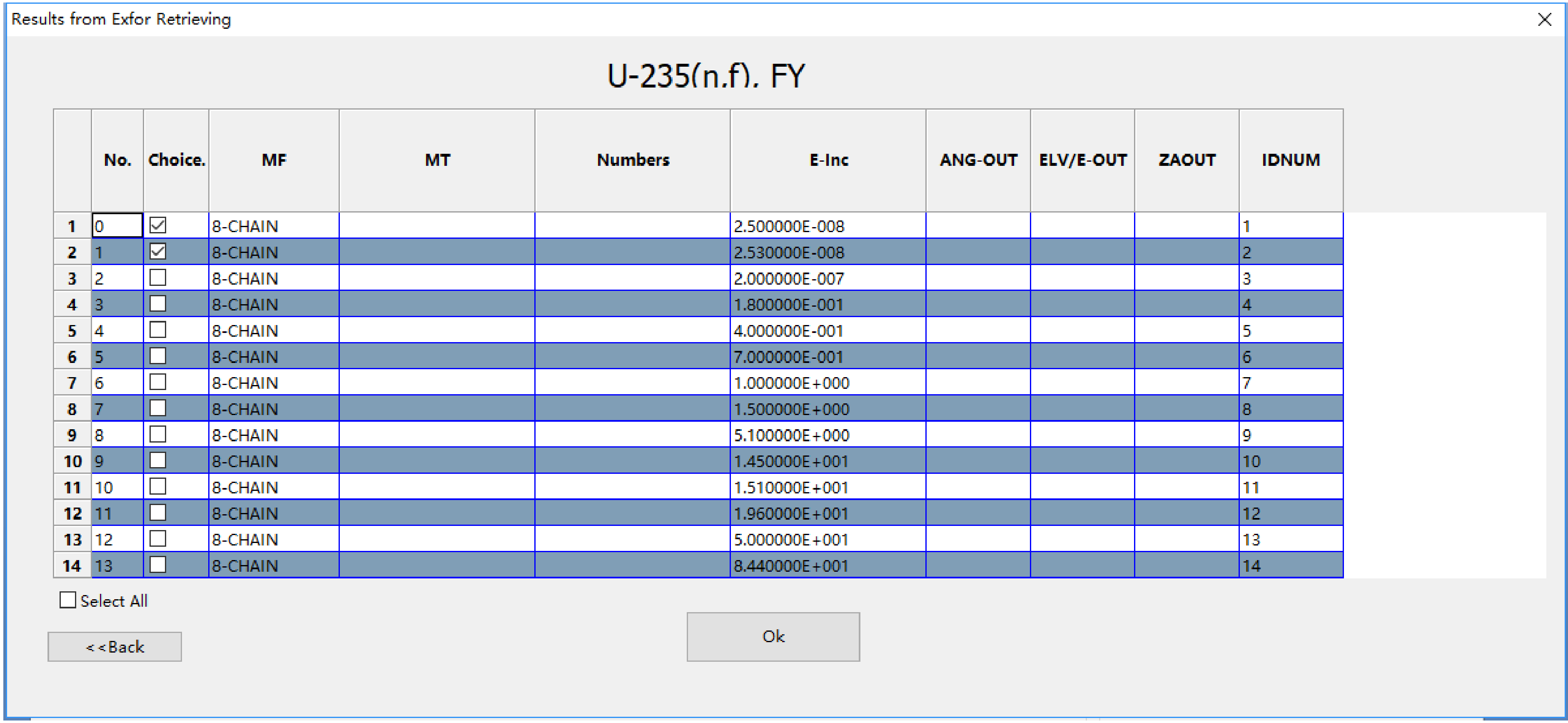
	Choice	FullCode
4	☑	
5	☑	92-U-235(N,F)MASS,CHN,FY,,FST
6	☑	92-U-235(N,F)MASS,CHN,FY,,MXW
7	☑	92-U-235(N,F)MASS,CHN,FY,,MXW/REL
8	☑	92-U-235(N,F)MASS,CHN,FY,,REL
9	☑	92-U-235(N,F)MASS,CHN,FY,,SPA
10	☑	92-U-235(N,F)MASS,CHN,FY/DE,,MXW/REL

Filter: ^/$ (at the beginning/end of the

chn

☑ Not Ratio

Demonstrations：Chain Yield



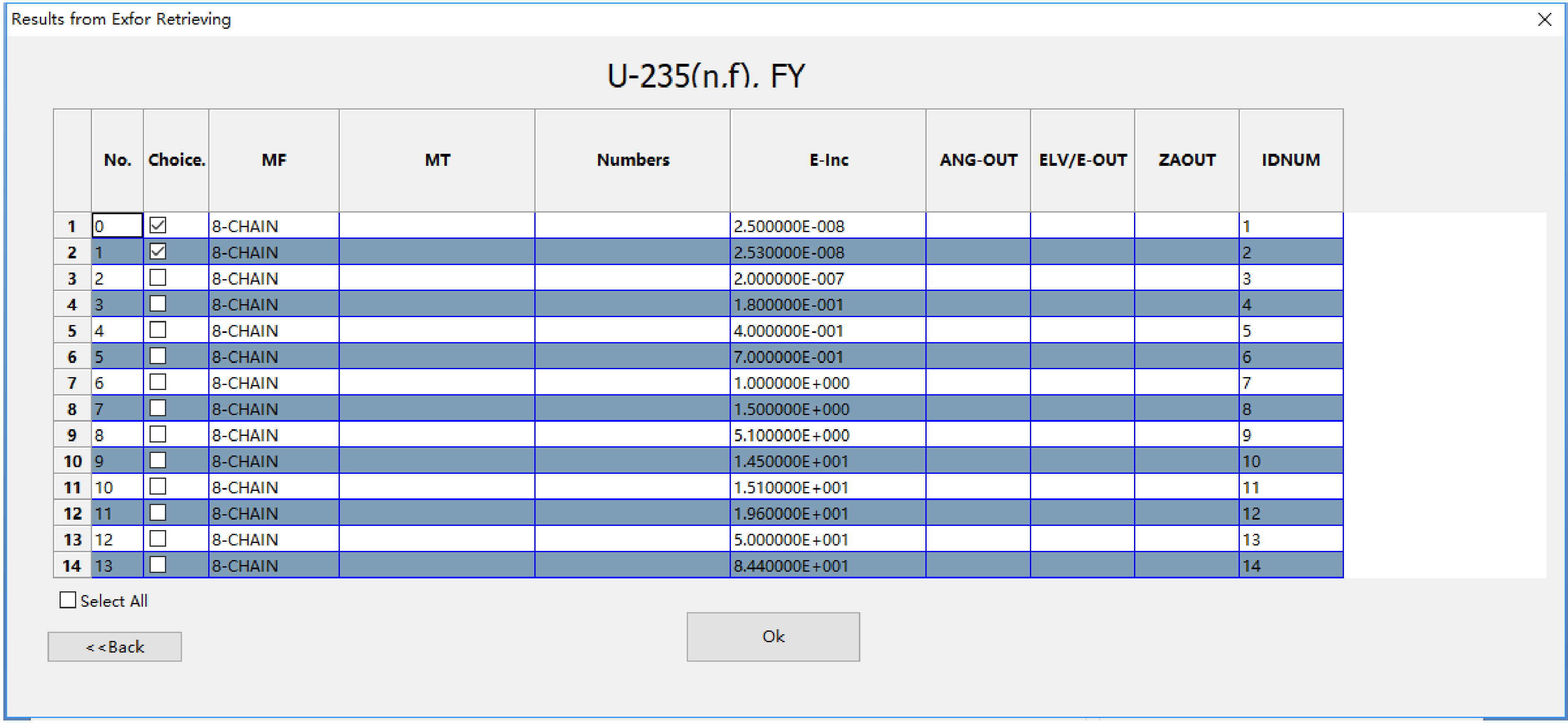
Results from Exfor Retrieving

U-235(n.f), FY

	No.	Choice.	MF	MT	Numbers	E-Inc	ANG-OUT	ELV/E-OUT	ZAOUT	IDNUM
1	0	☑	8-CHAIN			2.500000E-008				1
2	1	☑	8-CHAIN			2.530000E-008				2
3	2	☐	8-CHAIN			2.000000E-007				3
4	3	☐	8-CHAIN			1.800000E-001				4
5	4	☐	8-CHAIN			4.000000E-001				5
6	5	☐	8-CHAIN			7.000000E-001				6
7	6	☐	8-CHAIN			1.000000E+000				7
8	7	☐	8-CHAIN			1.500000E+000				8
9	8	☐	8-CHAIN			5.100000E+000				9
10	9	☐	8-CHAIN			1.450000E+001				10
11	10	☐	8-CHAIN			1.510000E+001				11
12	11	☐	8-CHAIN			1.960000E+001				12
13	12	☐	8-CHAIN			5.000000E+001				13
14	13	☐	8-CHAIN			8.440000E+001				14

☐ Select All

Demonstrations：Chain Yield

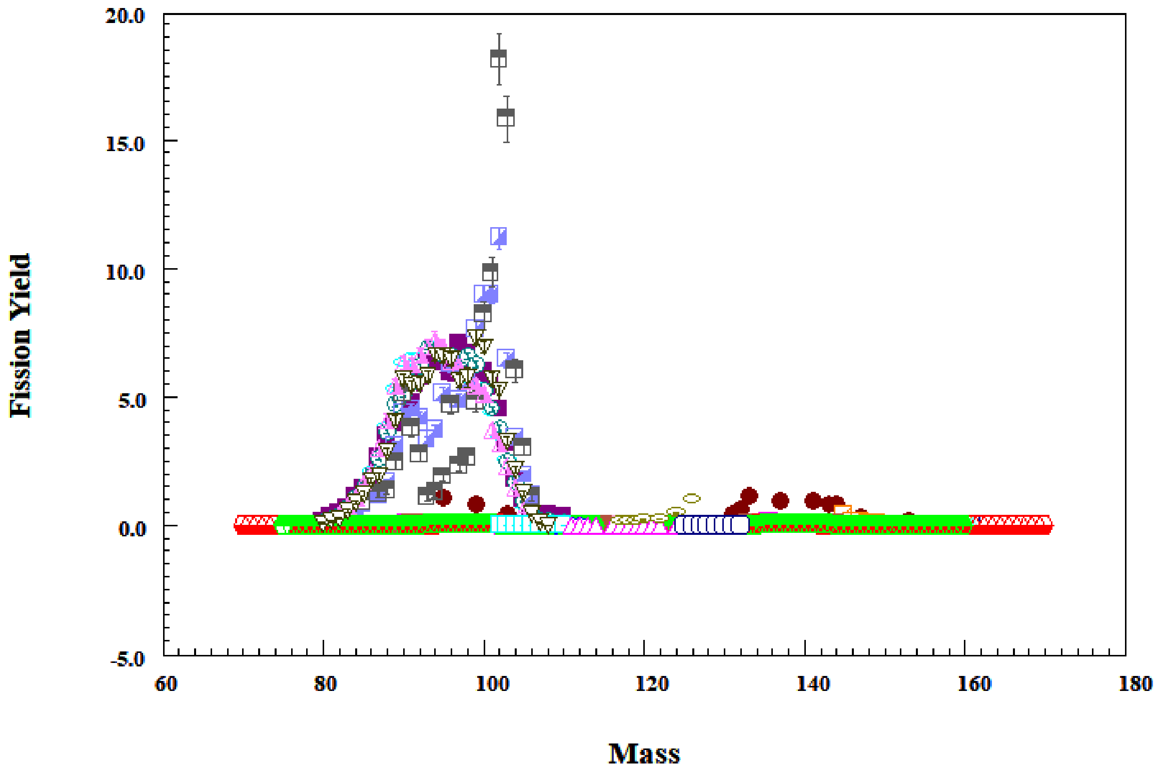


Results from Exfor Retrieving

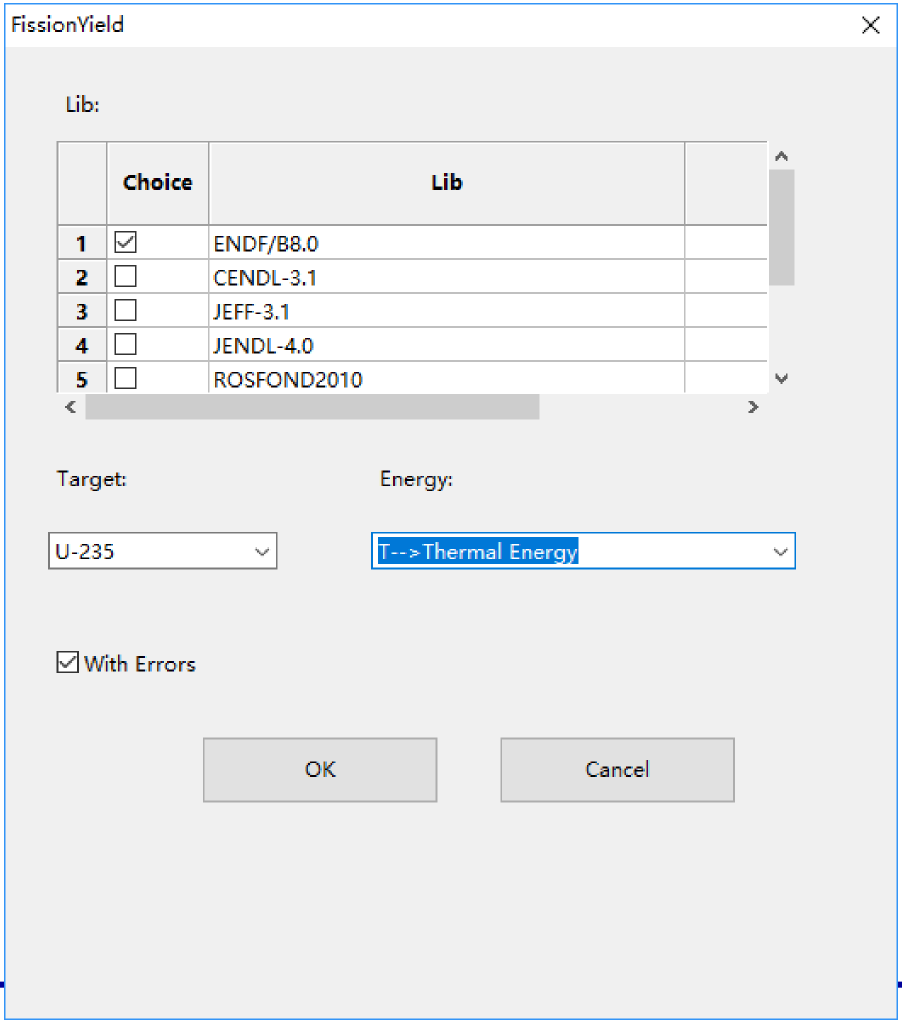
U-235(n.f). FY

	No.	Choice.	MF	MT	Numbers	E-Inc	ANG-OUT	ELV/E-OUT	ZAOUT	IDNUM
1	0	☑	8-CHAIN			2.500000E-008				1
2	1	☑	8-CHAIN			2.530000E-008				2
3	2	☐	8-CHAIN			2.000000E-007				3
4	3	☐	8-CHAIN			1.800000E-001				4
5	4	☐	8-CHAIN			4.000000E-001				5
6	5	☐	8-CHAIN			7.000000E-001				6
7	6	☐	8-CHAIN			1.000000E+000				7
8	7	☐	8-CHAIN			1.500000E+000				8
9	8	☐	8-CHAIN			5.100000E+000				9
10	9	☐	8-CHAIN			1.450000E+001				10
11	10	☐	8-CHAIN			1.510000E+001				11
12	11	☐	8-CHAIN			1.960000E+001				12
13	12	☐	8-CHAIN			5.000000E+001				13
14	13	☐	8-CHAIN			8.440000E+001				14

Demonstrations：Chain Yield



Demonstrations：Chain Yield



FissionYield

Lib:

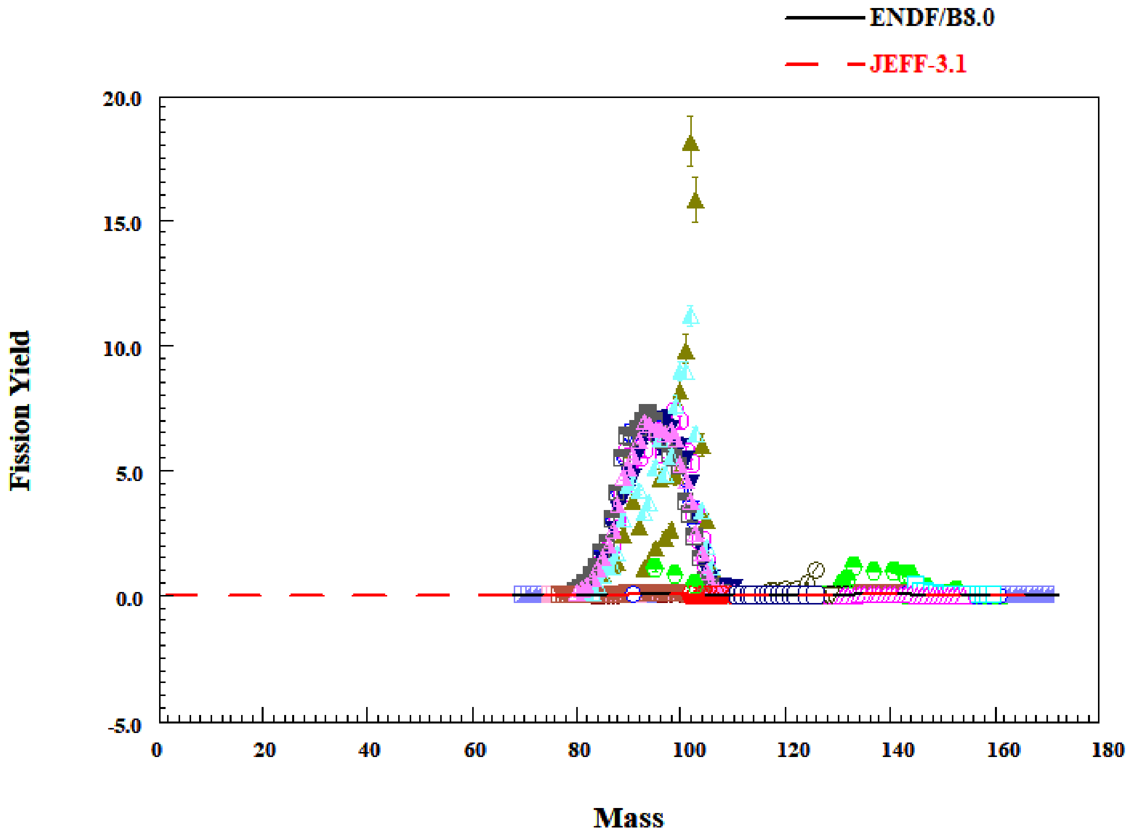
	Choice	Lib
1	☑	ENDF/B8.0
2	☐	CENDL-3.1
3	☐	JEFF-3.1
4	☐	JENDL-4.0
5	☐	ROSFOND2010

Target: U-235

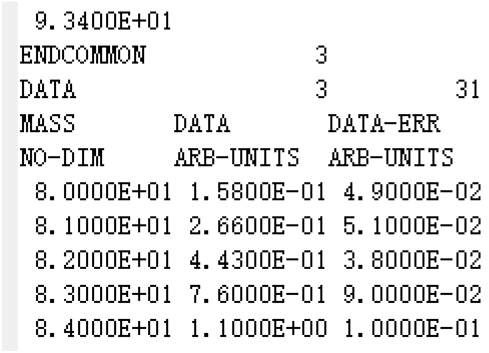
Energy: T-->Thermal Energy

☑ With Errors

Demonstrations：Chain Yield



Discrepancy between Exp. and Eval.



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 9.3400E+01
ENDCOMMON            3
DATA                 3          31
MASS        DATA        DATA-ERR
NO-DIM      ARB-UNITS   ARB-UNITS
 8.0000E+01 1.5800E-01 4.9000E-02
 8.1000E+01 2.6600E-01 5.1000E-02
 8.2000E+01 4.4300E-01 3.8000E-02
 8.3000E+01 7.6000E-01 9.0000E-02
 8.4000E+01 1.1000E+00 1.0000E-01
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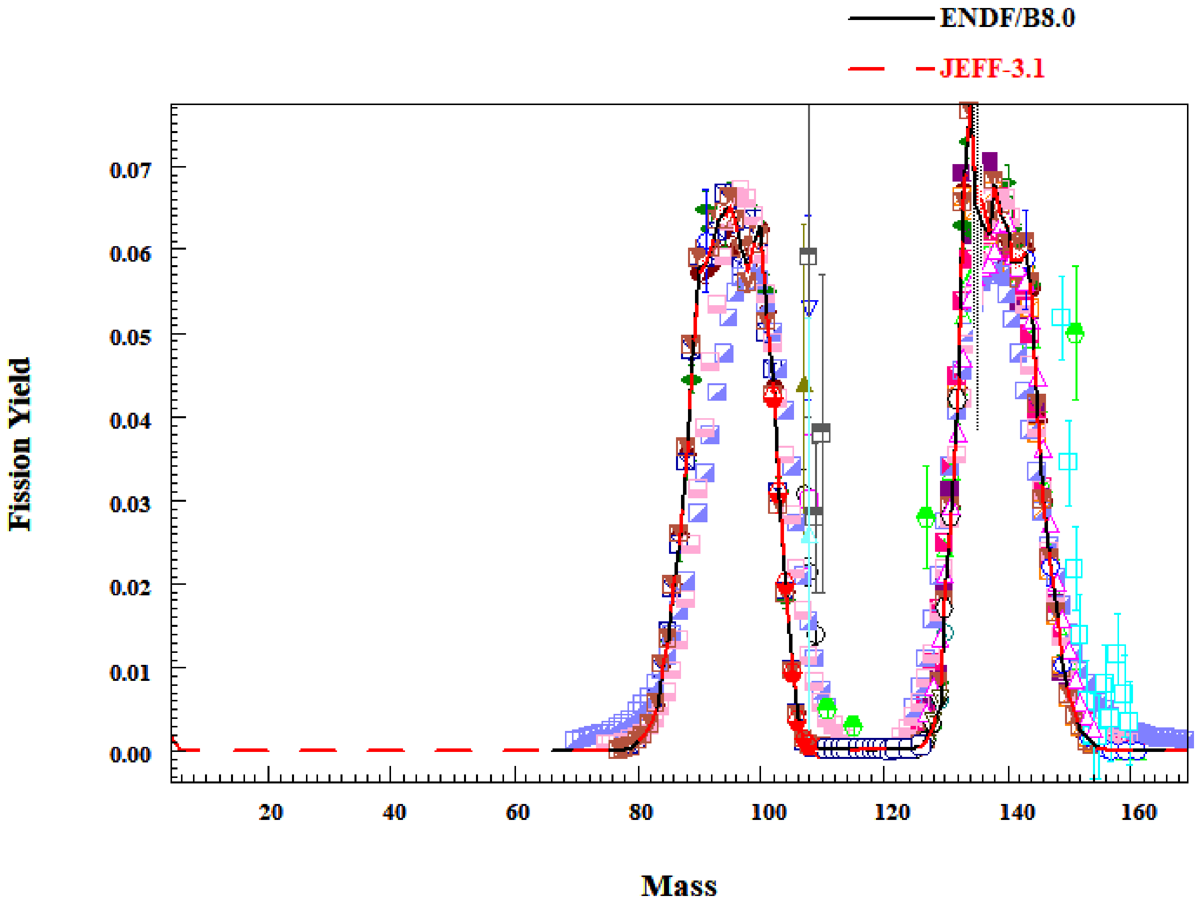
Demonstrations：Chain Yield

Display Local area



Demonstrations：Chain Yield

Arb-Units Data is not completely unusable

```
DATA                      3          31
MASS         DATA         DATA-ERR
NO-DIM       ARB-UNITS    ARB-UNITS
 8.0000E+01  1.5800E-01  4.9000E-02
 8.1000E+01  2.6600E-01  5.1000E-02
 8.2000E+01  4.4300E-01  3.8000E-02
 8.3000E+01  7.6000E-01  9.0000E-02
 8.4000E+01  1.1000E+00  1.0000E-01
 8.5000E+01  1.7100E+00  1.2000E-01
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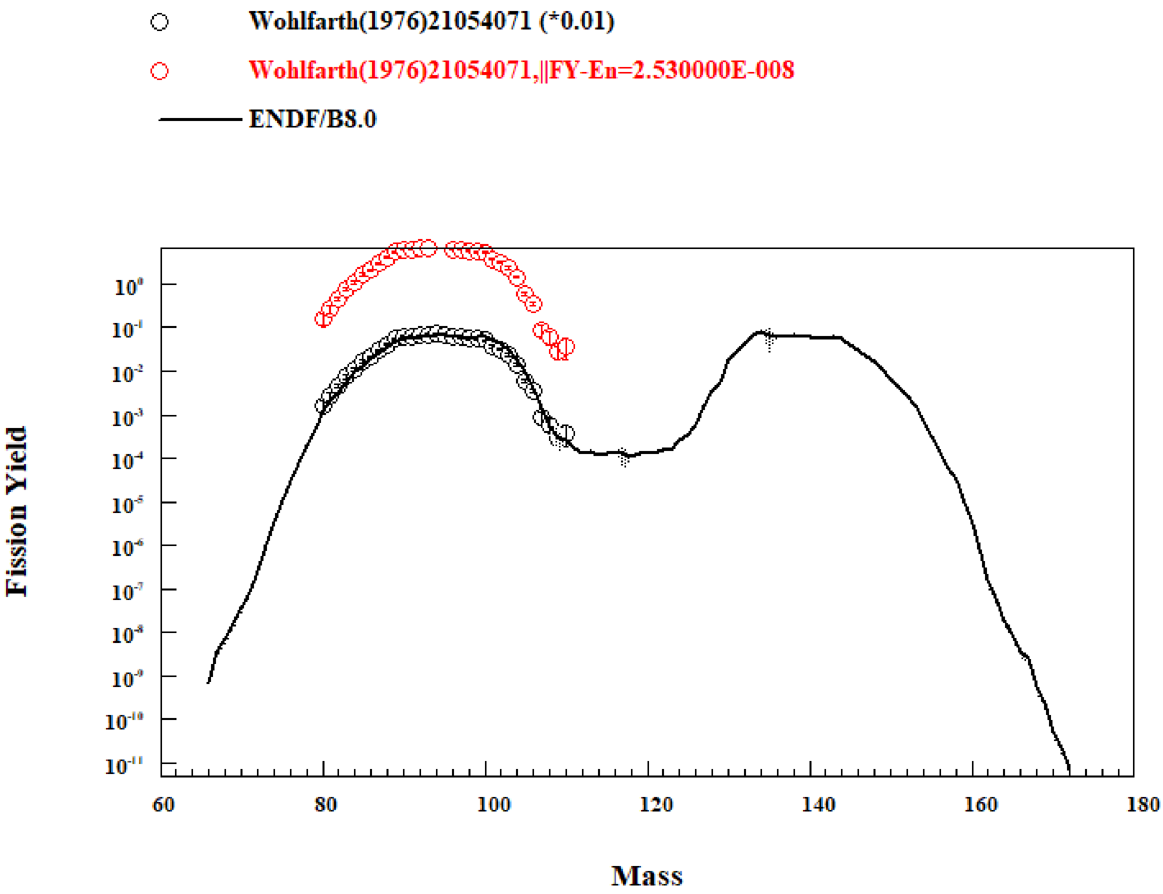
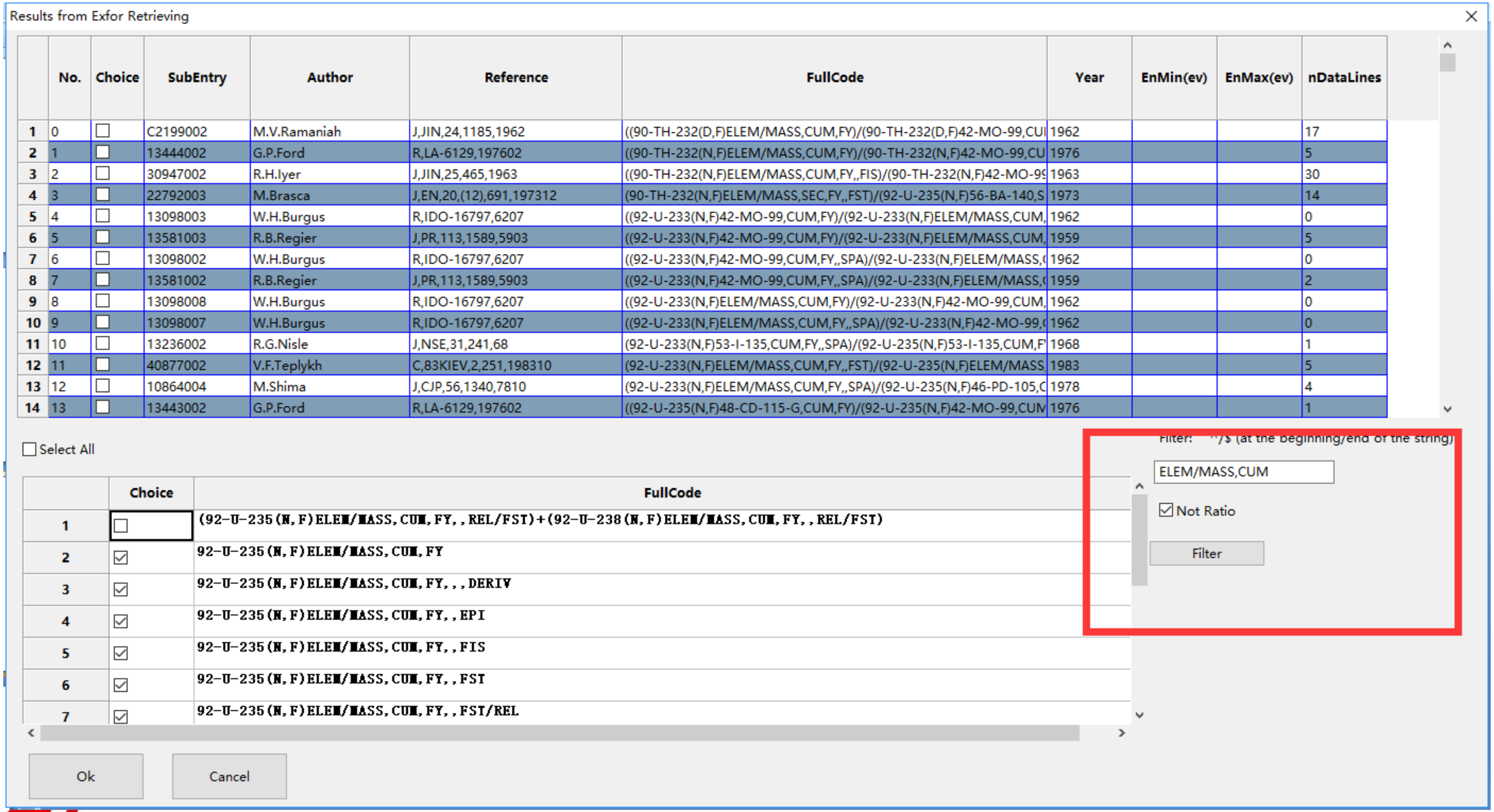


shift the points downwards by column operation

Demonstrations：Chain Yield

92-U-235(N,F)ELEM/MASS,CUM,FY



Results from Exfor Retrieving

	No.	Choice	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMax(ev)	nDataLines
1	0	☐	C2199002	M.V.Ramaniah	J,JIN,24,1185,1962	((90-TH-232(D,F)ELEM/MASS,CUM,FY)/(90-TH-232(D,F)42-MO-99,CU	1962			17
2	1	☐	13444002	G.P.Ford	R,LA-6129,197602	((90-TH-232(N,F)ELEM/MASS,CUM,FY)/(90-TH-232(N,F)42-MO-99,CU	1976			5
3	2	☐	30947002	R.H.Iyer	J,JIN,25,465,1963	((90-TH-232(N,F)ELEM/MASS,CUM,FY,,FIS)/(90-TH-232(N,F)42-MO-9	1963			30
4	3	☐	22792003	M.Brasca	J,EN,20,(12),691,197312	(90-TH-232(N,F)ELEM/MASS,SEC,FY,,FST)/(92-U-235(N,F)56-BA-140,S	1973			14
5	4	☐	13098003	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1962			0
6	5	☐	13581003	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1959			5
7	6	☐	13098002	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1962			0
8	7	☐	13581002	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1959			2
9	8	☐	13098008	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY)/(92-U-233(N,F)42-MO-99,CUM,	1962			0
10	9	☐	13098007	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-233(N,F)42-MO-99,	1962			0
11	10	☐	13236002	R.G.Nisle	J,NSE,31,241,68	(92-U-233(N,F)53-I-135,CUM,FY,,SPA)/(92-U-235(N,F)53-I-135,CUM,F	1968			1
12	11	☐	40877002	V.F.Teplykh	C,83KIEV,2,251,198310	(92-U-233(N,F)ELEM/MASS,CUM,FY,,FST)/(92-U-235(N,F)ELEM/MASS	1983			5
13	12	☐	10864004	M.Shima	J,CJP,56,1340,7810	(92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-235(N,F)46-PD-105,C	1978			4
14	13	☐	13443002	G.P.Ford	R,LA-6129,197602	((92-U-235(N,F)48-CD-115-G,CUM,FY)/(92-U-235(N,F)42-MO-99,CUM	1976			1

☐ Select All

	Choice	FullCode
1	☐	(92-U-235(N,F)ELEM/MASS,CUM,FY,,REL/FST)+(92-U-238(N,F)ELEM/MASS,CUM,FY,,REL/FST)
2	☑	92-U-235(N,F)ELEM/MASS,CUM,FY
3	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,,DERIV
4	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,EPI
5	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FIS
6	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST
7	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST/REL

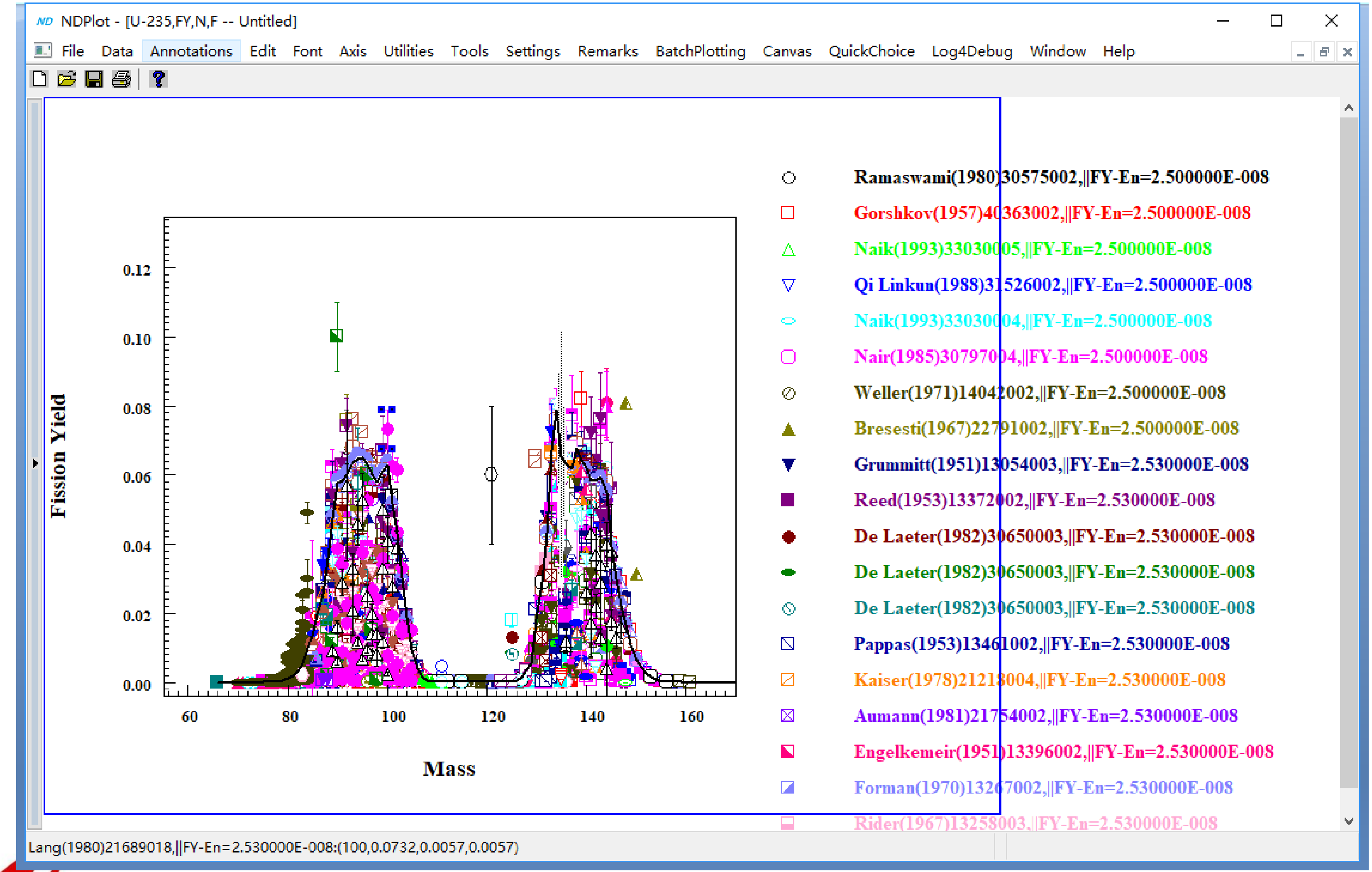
Filter: ^/$ (at the beginning/end of the string)

ELEM/MASS,CUM

☑ Not Ratio

shift the points downwards by column operation

Demonstrations：Chain Yield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File
Data
Annotations
Edit
Font
Axis
Utilities
Tools
Settings
Remarks
BatchPlotting
Canvas
QuickChoice
Log4Debug
Window
Help
Fission Yield
0.12
0.10
0.08
0.06
0.04
0.02
0.00
60
80
100
120
140
160
Mass
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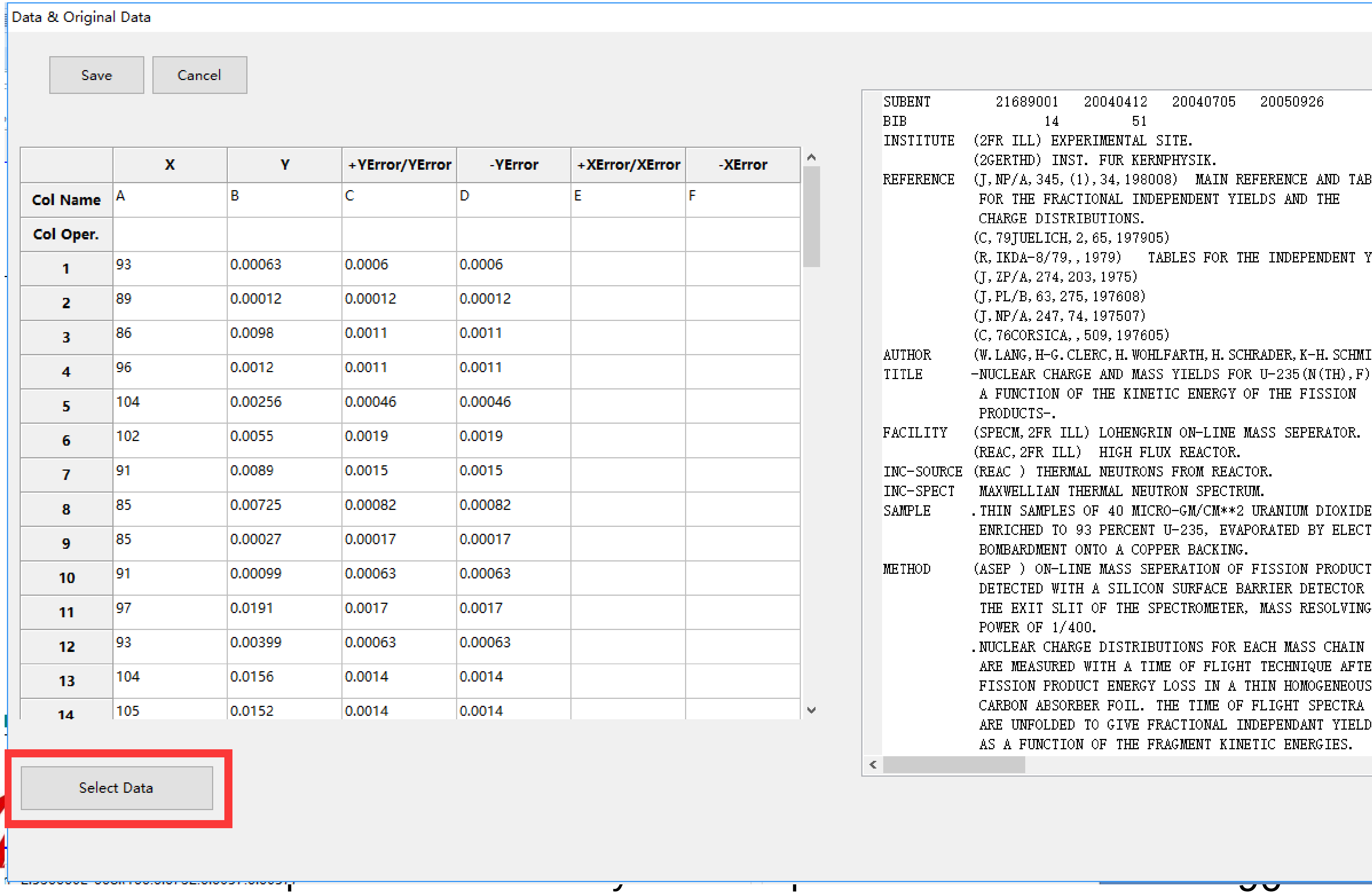
□ Gorshkov(1957)40363002,||FY-En=2.500000E-008
△ Naik(1993)33030005,||FY-En=2.500000E-008
▽ Qi Linkun(1988)31526002,||FY-En=2.500000E-008
⬭ Naik(1993)33030004,||FY-En=2.500000E-008
▢ Nair(1985)30797004,||FY-En=2.500000E-008
⊘ Weller(1971)14042002,||FY-En=2.500000E-008
▲ Bresesti(1967)22791002,||FY-En=2.500000E-008
▼ Grummitt(1951)13054003,||FY-En=2.530000E-008
■ Reed(1953)13372002,||FY-En=2.530000E-008
● De Laeter(1982)30650003,||FY-En=2.530000E-008
⬬ De Laeter(1982)30650003,||FY-En=2.530000E-008
⦸ De Laeter(1982)30650003,||FY-En=2.530000E-008
⧅ Pappas(1953)13461002,||FY-En=2.530000E-008
⧄ Kaiser(1978)21218004,||FY-En=2.530000E-008
⊠ Aumann(1981)21754002,||FY-En=2.530000E-008
◩ Engelkemeir(1951)13396002,||FY-En=2.530000E-008
◪ Forman(1970)13267002,||FY-En=2.530000E-008
⬒ Rider(1967)13258003,||FY-En=2.530000E-008

Lang(1980)21689018,||FY-En=2.530000E-008:(100,0.0732,0.0057,0.0057)

shift the points downwards by column operation

Demonstrations：Chain Yield



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Col Name	A	B	C	D	E	F
Col Oper.						
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2	89	0.00012	0.00012	0.00012		
3	86	0.0098	0.0011	0.0011		
4	96	0.0012	0.0011	0.0011		
5	104	0.00256	0.00046	0.00046		
6	102	0.0055	0.0019	0.0019		
7	91	0.0089	0.0015	0.0015		
8	85	0.00725	0.00082	0.00082		
9	85	0.00027	0.00017	0.00017		
10	91	0.00099	0.00063	0.00063		
11	97	0.0191	0.0017	0.0017		
12	93	0.00399	0.00063	0.00063		
13	104	0.0156	0.0014	0.0014		
14	105	0.0152	0.0014	0.0014		

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BIB                 14         51
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           (2GERTHD) INST. FUR KERNPHYSIK.
REFERENCE  (J,NP/A,345,(1),34,198008)  MAIN REFERENCE AND TAB
            FOR THE FRACTIONAL INDEPENDENT YIELDS AND THE
            CHARGE DISTRIBUTIONS.
           (C,79JUELICH,2,65,197905)
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           (J,PL/B,63,275,197608)
           (J,NP/A,247,74,197507)
           (C,76CORSICA,,509,197605)
AUTHOR     (W.LANG,H-G.CLERC,H.WOHLFARTH,H.SCHRADER,K-H.SCHMI
TITLE      -NUCLEAR CHARGE AND MASS YIELDS FOR U-235(N(TH),F)
            A FUNCTION OF THE KINETIC ENERGY OF THE FISSION
            PRODUCTS-.
FACILITY   (SPECM,2FR ILL) LOHENGRIN ON-LINE MASS SEPERATOR.
           (REAC,2FR ILL)  HIGH FLUX REACTOR.
INC-SOURCE (REAC ) THERMAL NEUTRONS FROM REACTOR.
INC-SPECT   MAXWELLIAN THERMAL NEUTRON SPECTRUM.
SAMPLE     .THIN SAMPLES OF 40 MICRO-GM/CM**2 URANIUM DIOXIDE
            ENRICHED TO 93 PERCENT U-235, EVAPORATED BY ELECT
            BOMBARDMENT ONTO A COPPER BACKING.
METHOD     (ASEP ) ON-LINE MASS SEPERATION OF FISSION PRODUCT
            DETECTED WITH A SILICON SURFACE BARRIER DETECTOR
            THE EXIT SLIT OF THE SPECTROMETER, MASS RESOLVING
            POWER OF 1/400.
           .NUCLEAR CHARGE DISTRIBUTIONS FOR EACH MASS CHAIN
            ARE MEASURED WITH A TIME OF FLIGHT TECHNIQUE AFTE
            FISSION PRODUCT ENERGY LOSS IN A THIN HOMOGENEOUS
            CARBON ABSORBER FOIL. THE TIME OF FLIGHT SPECTRA
            ARE UNFOLDED TO GIVE FRACTIONAL INDEPENDANT YIELD
            AS A FUNCTION OF THE FRAGMENT KINETIC ENERGIES.
```
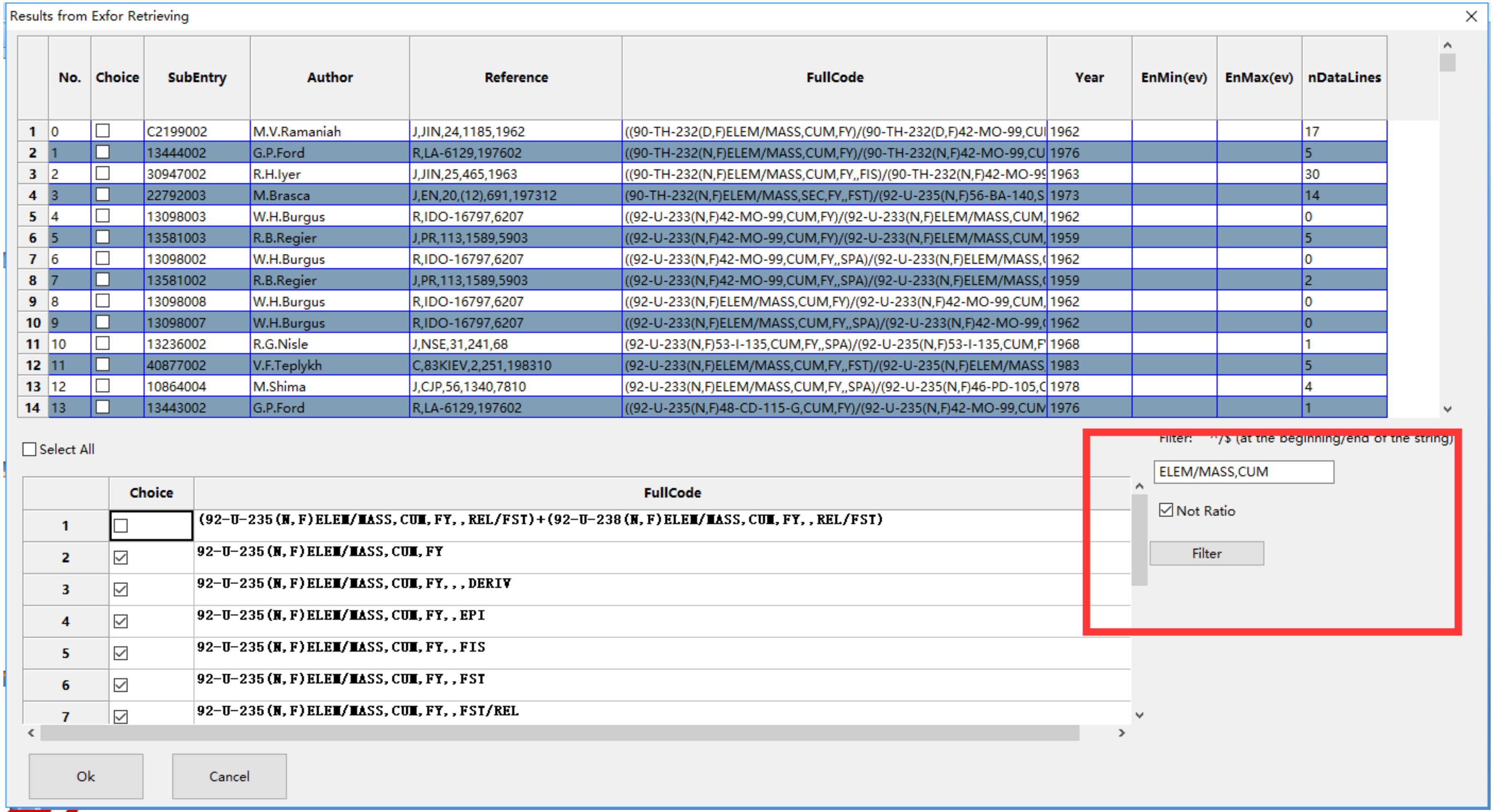

Demonstrations：Chain Yield

92-U-235(N,F)ELEM/MASS,CUM,FY



Results from Exfor Retrieving

	No.	Choice	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMax(ev)	nDataLines
1	0	☐	C2199002	M.V.Ramaniah	J,JIN,24,1185,1962	((90-TH-232(D,F)ELEM/MASS,CUM,FY)/(90-TH-232(D,F)42-MO-99,CU	1962			17
2	1	☐	13444002	G.P.Ford	R,LA-6129,197602	((90-TH-232(N,F)ELEM/MASS,CUM,FY)/(90-TH-232(N,F)42-MO-99,CU	1976			5
3	2	☐	30947002	R.H.Iyer	J,JIN,25,465,1963	((90-TH-232(N,F)ELEM/MASS,CUM,FY,,FIS)/(90-TH-232(N,F)42-MO-9	1963			30
4	3	☐	22792003	M.Brasca	J,EN,20,(12),691,197312	(90-TH-232(N,F)ELEM/MASS,SEC,FY,,FST)/(92-U-235(N,F)56-BA-140,S	1973			14
5	4	☐	13098003	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1962			0
6	5	☐	13581003	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1959			5
7	6	☐	13098002	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1962			0
8	7	☐	13581002	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1959			2
9	8	☐	13098008	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY)/(92-U-233(N,F)42-MO-99,CUM,	1962			0
10	9	☐	13098007	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-233(N,F)42-MO-99,	1962			0
11	10	☐	13236002	R.G.Nisle	J,NSE,31,241,68	(92-U-233(N,F)53-I-135,CUM,FY,,SPA)/(92-U-235(N,F)53-I-135,CUM,F	1968			1
12	11	☐	40877002	V.F.Teplykh	C,83KIEV,2,251,198310	(92-U-233(N,F)ELEM/MASS,CUM,FY,,FST)/(92-U-235(N,F)ELEM/MASS,	1983			5
13	12	☐	10864004	M.Shima	J,CJP,56,1340,7810	(92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-235(N,F)46-PD-105,	1978			4
14	13	☐	13443002	G.P.Ford	R,LA-6129,197602	((92-U-235(N,F)48-CD-115-G,CUM,FY)/(92-U-235(N,F)42-MO-99,CU	1976			1

☐ Select All

	Choice	FullCode
1	☐	(92-U-235(N,F)ELEM/MASS,CUM,FY,,REL/FST)+(92-U-238(N,F)ELEM/MASS,CUM,FY,,REL/FST)
2	☑	92-U-235(N,F)ELEM/MASS,CUM,FY
3	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,,DERIV
4	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,EPI
5	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FIS
6	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST
7	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST/REL

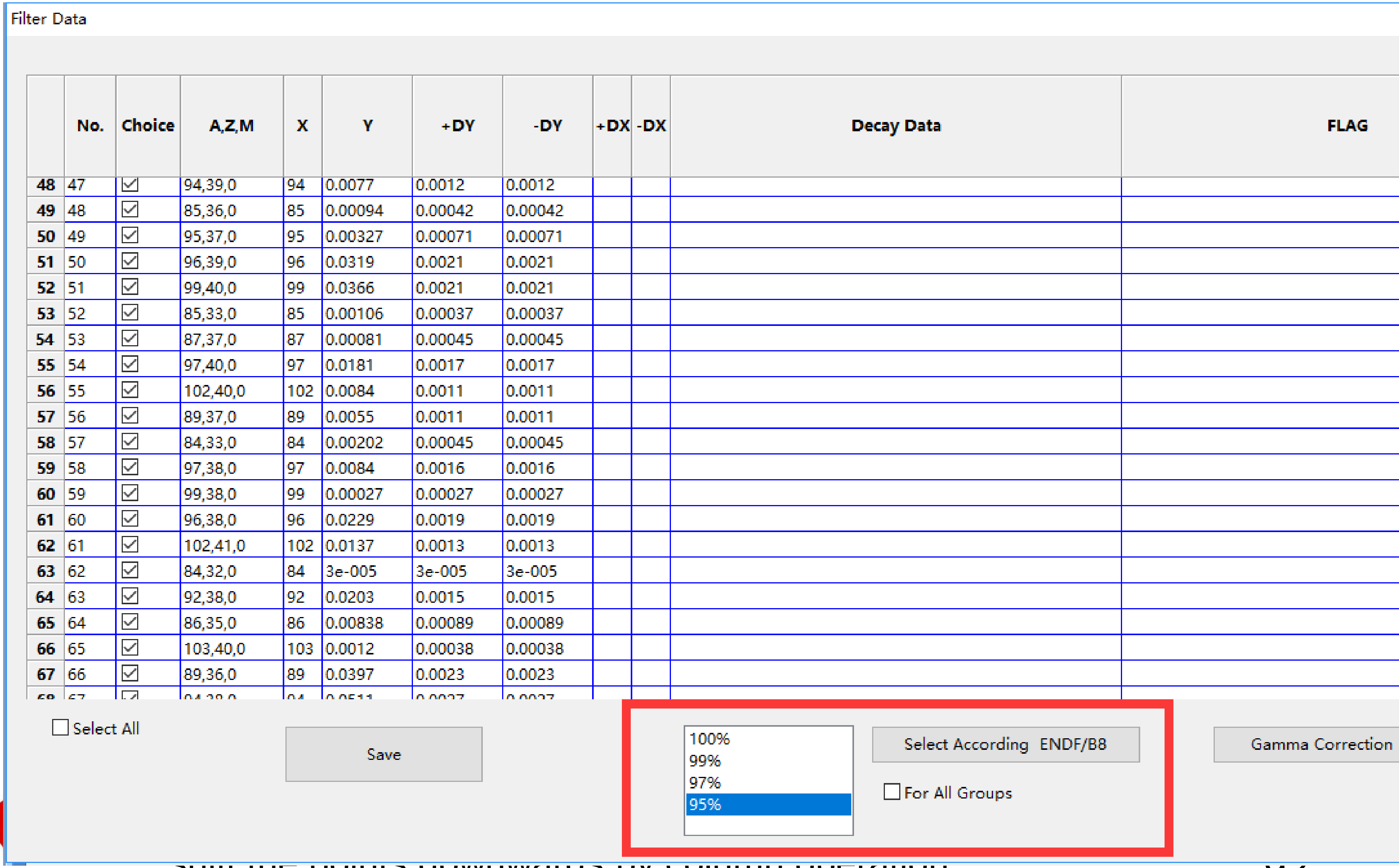
Filter: ^/$ (at the beginning/end of the string)

ELEM/MASS,CUM

☑ Not Ratio

shift the points downwards by column operation

Demonstrations：Chain Yield


Filter Data

	No.	Choice	A,Z,M	X	Y	+DY	-DY	+DX	-DX	Decay Data	FLAG
48	47	☑	94,39,0	94	0.0077	0.0012	0.0012				
49	48	☑	85,36,0	85	0.00094	0.00042	0.00042				
50	49	☑	95,37,0	95	0.00327	0.00071	0.00071				
51	50	☑	96,39,0	96	0.0319	0.0021	0.0021				
52	51	☑	99,40,0	99	0.0366	0.0021	0.0021				
53	52	☑	85,33,0	85	0.00106	0.00037	0.00037				
54	53	☑	87,37,0	87	0.00081	0.00045	0.00045				
55	54	☑	97,40,0	97	0.0181	0.0017	0.0017				
56	55	☑	102,40,0	102	0.0084	0.0011	0.0011				
57	56	☑	89,37,0	89	0.0055	0.0011	0.0011				
58	57	☑	84,33,0	84	0.00202	0.00045	0.00045				
59	58	☑	97,38,0	97	0.0084	0.0016	0.0016				
60	59	☑	99,38,0	99	0.00027	0.00027	0.00027				
61	60	☑	96,38,0	96	0.0229	0.0019	0.0019				
62	61	☑	102,41,0	102	0.0137	0.0013	0.0013				
63	62	☑	84,32,0	84	3e-005	3e-005	3e-005				
64	63	☑	92,38,0	92	0.0203	0.0015	0.0015				
65	64	☑	86,35,0	86	0.00838	0.00089	0.00089				
66	65	☑	103,40,0	103	0.0012	0.00038	0.00038				
67	66	☑	89,36,0	89	0.0397	0.0023	0.0023				

☐ Select All

shift the points downwards by column operation

Demonstrations：Chain Yield

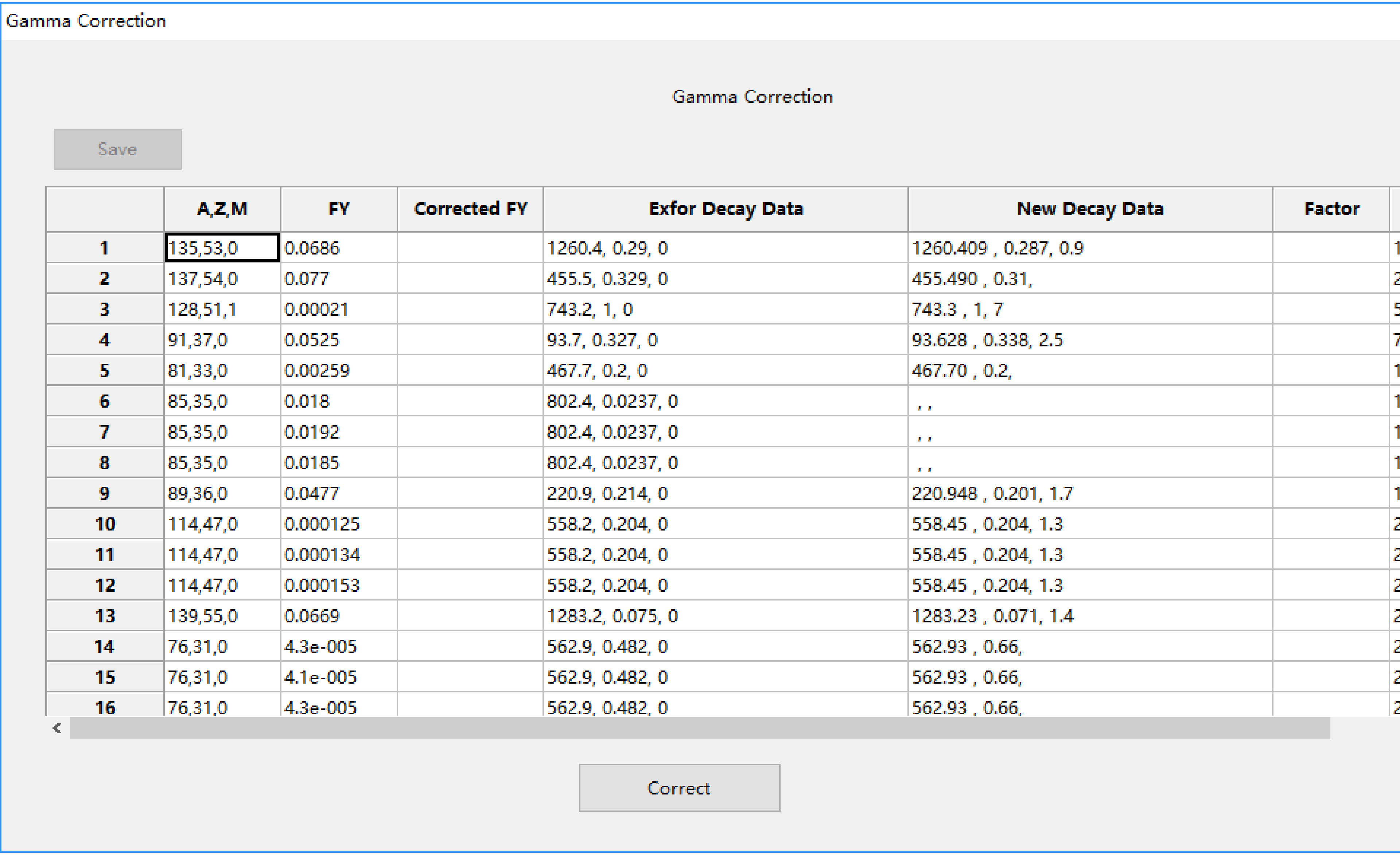
According to ENDFB8：
100%，99%，97%，95%

In ENDF/B8-FY,

If the cumulative yield of the product (z,a,m) >= 100%(99%,97%,95%)*chain-yield,
the product can be chosen.

shift the points downwards by column operation

Demonstrations：Chain Yield—Gamma Correction

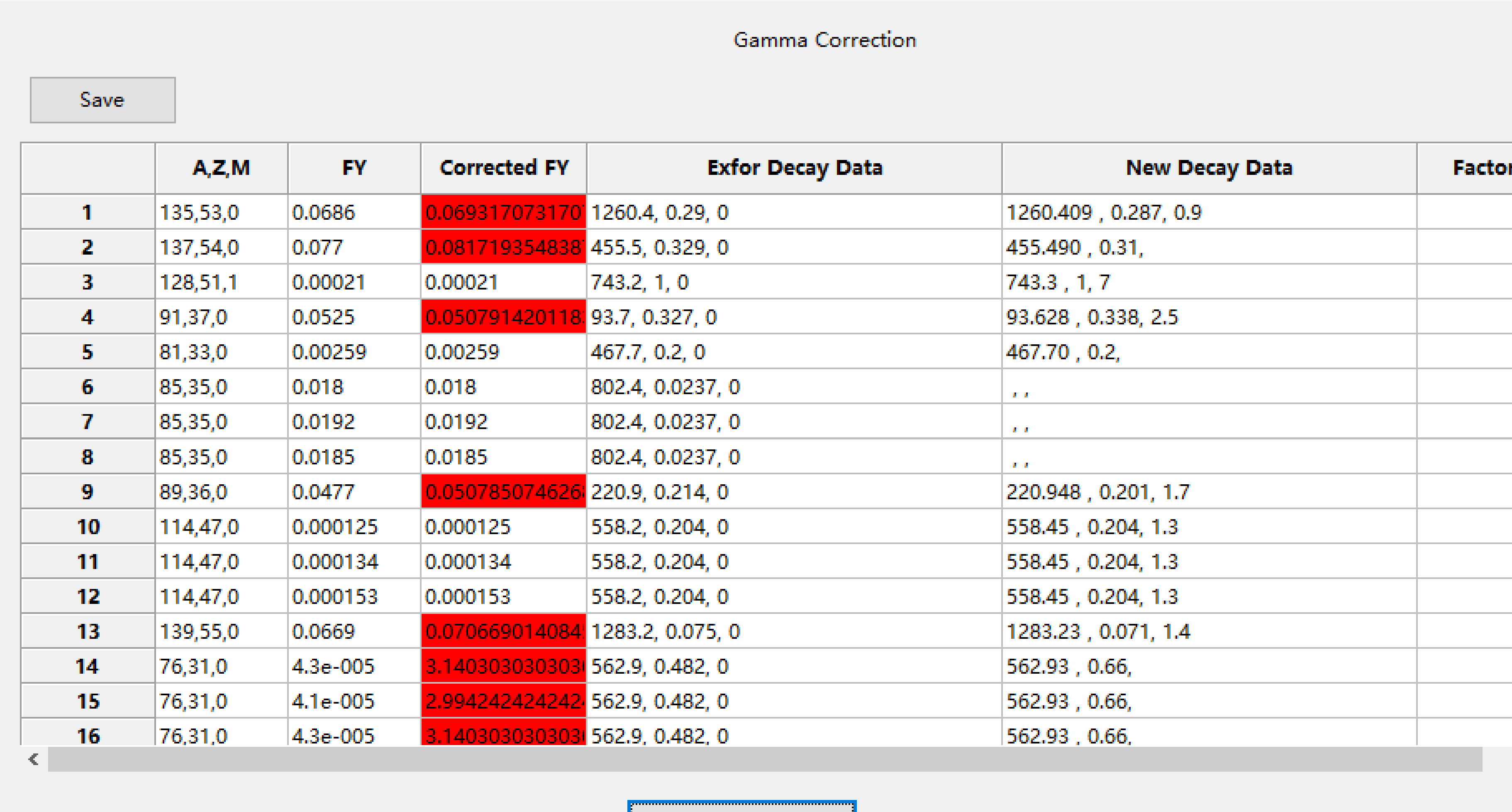


	A,Z,M	FY	Corrected FY	Exfor Decay Data	New Decay Data	Factor
1	135,53,0	0.0686		1260.4, 0.29, 0	1260.409 , 0.287, 0.9	
2	137,54,0	0.077		455.5, 0.329, 0	455.490 , 0.31,	
3	128,51,1	0.00021		743.2, 1, 0	743.3 , 1, 7	
4	91,37,0	0.0525		93.7, 0.327, 0	93.628 , 0.338, 2.5	
5	81,33,0	0.00259		467.7, 0.2, 0	467.70 , 0.2,	
6	85,35,0	0.018		802.4, 0.0237, 0	, ,	
7	85,35,0	0.0192		802.4, 0.0237, 0	, ,	
8	85,35,0	0.0185		802.4, 0.0237, 0	, ,	
9	89,36,0	0.0477		220.9, 0.214, 0	220.948 , 0.201, 1.7	
10	114,47,0	0.000125		558.2, 0.204, 0	558.45 , 0.204, 1.3	
11	114,47,0	0.000134		558.2, 0.204, 0	558.45 , 0.204, 1.3	
12	114,47,0	0.000153		558.2, 0.204, 0	558.45 , 0.204, 1.3	
13	139,55,0	0.0669		1283.2, 0.075, 0	1283.23 , 0.071, 1.4	
14	76,31,0	4.3e-005		562.9, 0.482, 0	562.93 , 0.66,	
15	76,31,0	4.1e-005		562.9, 0.482, 0	562.93 , 0.66,	
16	76,31,0	4.3e-005		562.9, 0.482, 0	562.93 , 0.66,	

Demonstrations：Chain Yield—Gamma Correction

The data in red cell is corrected

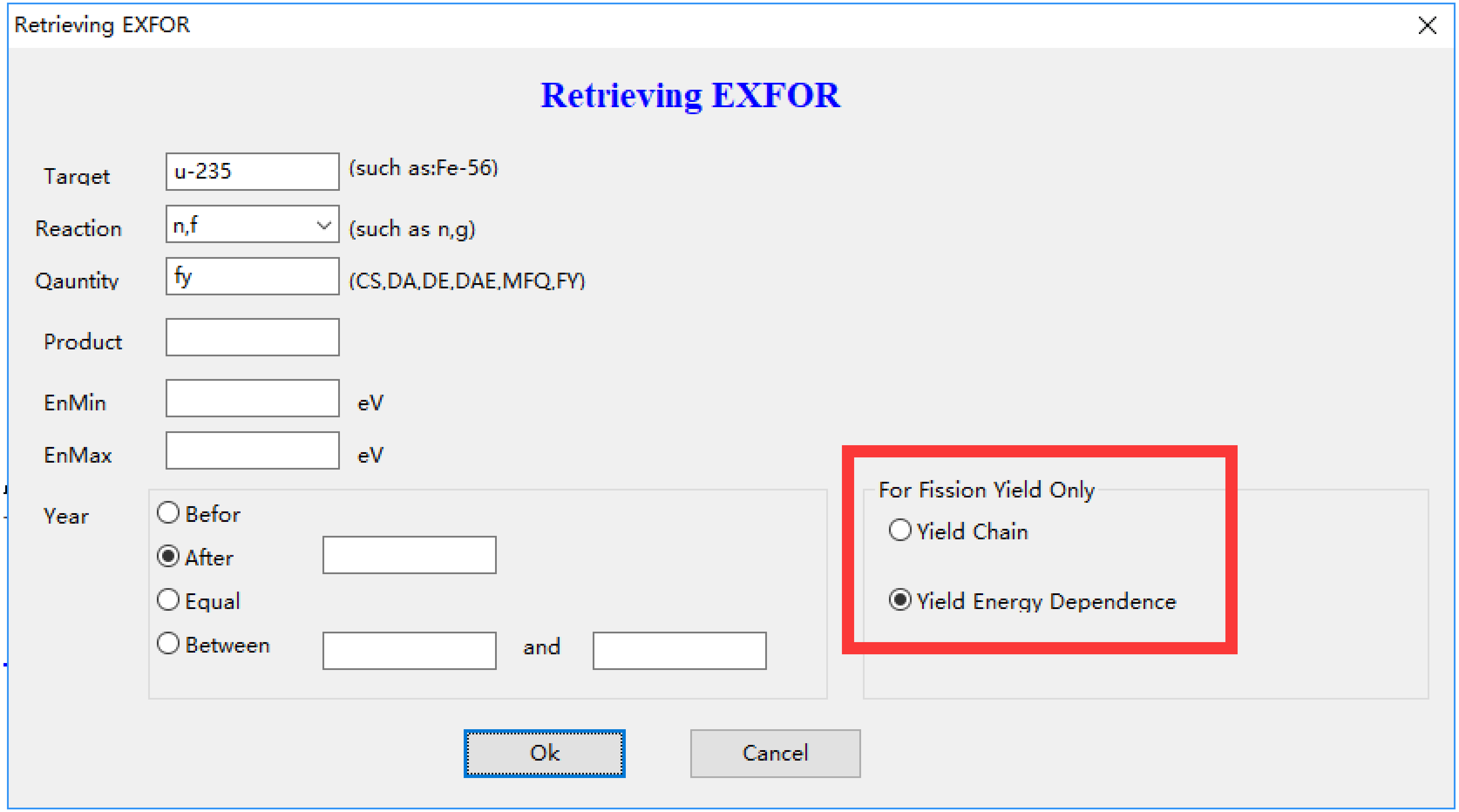
$FY_{corrected}=1/(\ Max(Intensity_{exfor})/\ Intensity_{new})*FY$



Gamma Correction

	A,Z,M	FY	Corrected FY	Exfor Decay Data	New Decay Data	Factor
1	135,53,0	0.0686	0.069317073170	1260.4, 0.29, 0	1260.409 , 0.287, 0.9	
2	137,54,0	0.077	0.081719354838	455.5, 0.329, 0	455.490 , 0.31,	
3	128,51,1	0.00021	0.00021	743.2, 1, 0	743.3 , 1, 7	
4	91,37,0	0.0525	0.050791420118	93.7, 0.327, 0	93.628 , 0.338, 2.5	
5	81,33,0	0.00259	0.00259	467.7, 0.2, 0	467.70 , 0.2,	
6	85,35,0	0.018	0.018	802.4, 0.0237, 0	, ,	
7	85,35,0	0.0192	0.0192	802.4, 0.0237, 0	, ,	
8	85,35,0	0.0185	0.0185	802.4, 0.0237, 0	, ,	
9	89,36,0	0.0477	0.050785074626	220.9, 0.214, 0	220.948 , 0.201, 1.7	
10	114,47,0	0.000125	0.000125	558.2, 0.204, 0	558.45 , 0.204, 1.3	
11	114,47,0	0.000134	0.000134	558.2, 0.204, 0	558.45 , 0.204, 1.3	
12	114,47,0	0.000153	0.000153	558.2, 0.204, 0	558.45 , 0.204, 1.3	
13	139,55,0	0.0669	0.070669014084	1283.2, 0.075, 0	1283.23 , 0.071, 1.4	
14	76,31,0	4.3e-005	3.140303030303	562.9, 0.482, 0	562.93 , 0.66,	
15	76,31,0	4.1e-005	2.994242424242	562.9, 0.482, 0	562.93 , 0.66,	
16	76,31,0	4.3e-005	3.140303030303	562.9, 0.482, 0	562.93 , 0.66,	

Demonstrations：Yield Energy Independence



Retrieving EXFOR

Retrieving EXFOR

Target: u-235 (such as:Fe-56)

Reaction: n,f (such as n,g)

Qauntity: fy (CS,DA,DE,DAE,MFQ,FY)

Product:

EnMin: eV

EnMax: eV

Year:

○ Befor

● After

○ Equal

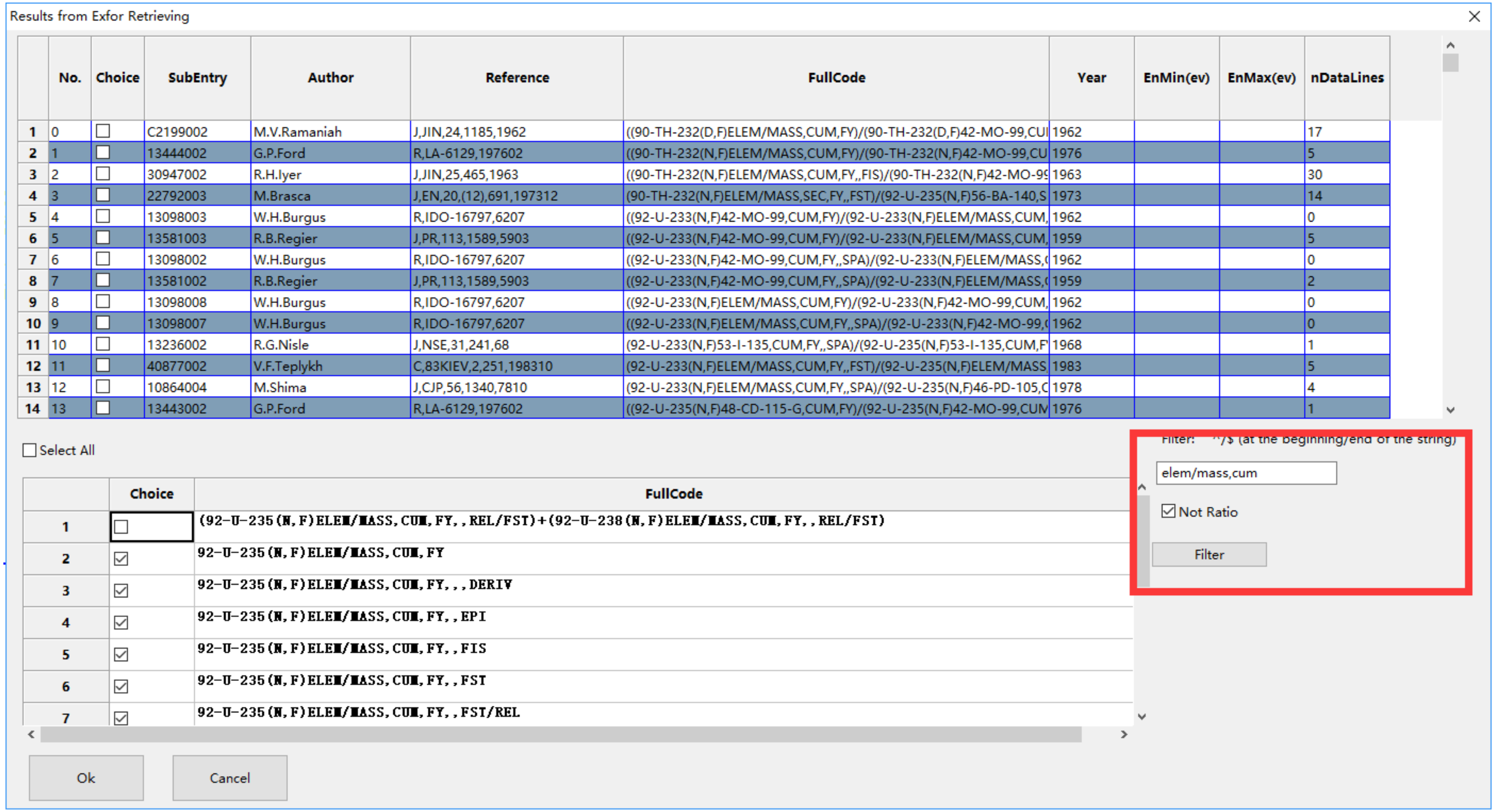
○ Between and

For Fission Yield Only

○ Yield Chain

● Yield Energy Dependence

Demonstrations：Yield Energy Independence



Results from Exfor Retrieving

	No.	Choice	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMax(ev)	nDataLines
1	0	☐	C2199002	M.V.Ramaniah	J,JIN,24,1185,1962	((90-TH-232(D,F)ELEM/MASS,CUM,FY)/(90-TH-232(D,F)42-MO-99,CU	1962			17
2	1	☐	13444002	G.P.Ford	R,LA-6129,197602	((90-TH-232(N,F)ELEM/MASS,CUM,FY)/(90-TH-232(N,F)42-MO-99,CU	1976			5
3	2	☐	30947002	R.H.Iyer	J,JIN,25,465,1963	((90-TH-232(N,F)ELEM/MASS,CUM,FY,,FIS)/(90-TH-232(N,F)42-MO-9	1963			30
4	3	☐	22792003	M.Brasca	J,EN,20,(12),691,197312	(90-TH-232(N,F)ELEM/MASS,SEC,FY,,FST)/(92-U-235(N,F)56-BA-140,S	1973			14
5	4	☐	13098003	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1962			0
6	5	☐	13581003	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1959			5
7	6	☐	13098002	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1962			0
8	7	☐	13581002	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1959			2
9	8	☐	13098008	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY)/(92-U-233(N,F)42-MO-99,CUM,	1962			0
10	9	☐	13098007	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-233(N,F)42-MO-99,	1962			0
11	10	☐	13236002	R.G.Nisle	J,NSE,31,241,68	(92-U-233(N,F)53-I-135,CUM,FY,,SPA)/(92-U-235(N,F)53-I-135,CUM,F	1968			1
12	11	☐	40877002	V.F.Teplykh	C,83KIEV,2,251,198310	(92-U-233(N,F)ELEM/MASS,CUM,FY,,FST)/(92-U-235(N,F)ELEM/MASS,	1983			5
13	12	☐	10864004	M.Shima	J,CJP,56,1340,7810	(92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-235(N,F)46-PD-105,C	1978			4
14	13	☐	13443002	G.P.Ford	R,LA-6129,197602	((92-U-235(N,F)48-CD-115-G,CUM,FY)/(92-U-235(N,F)42-MO-99,CUM	1976			1

☐ Select All

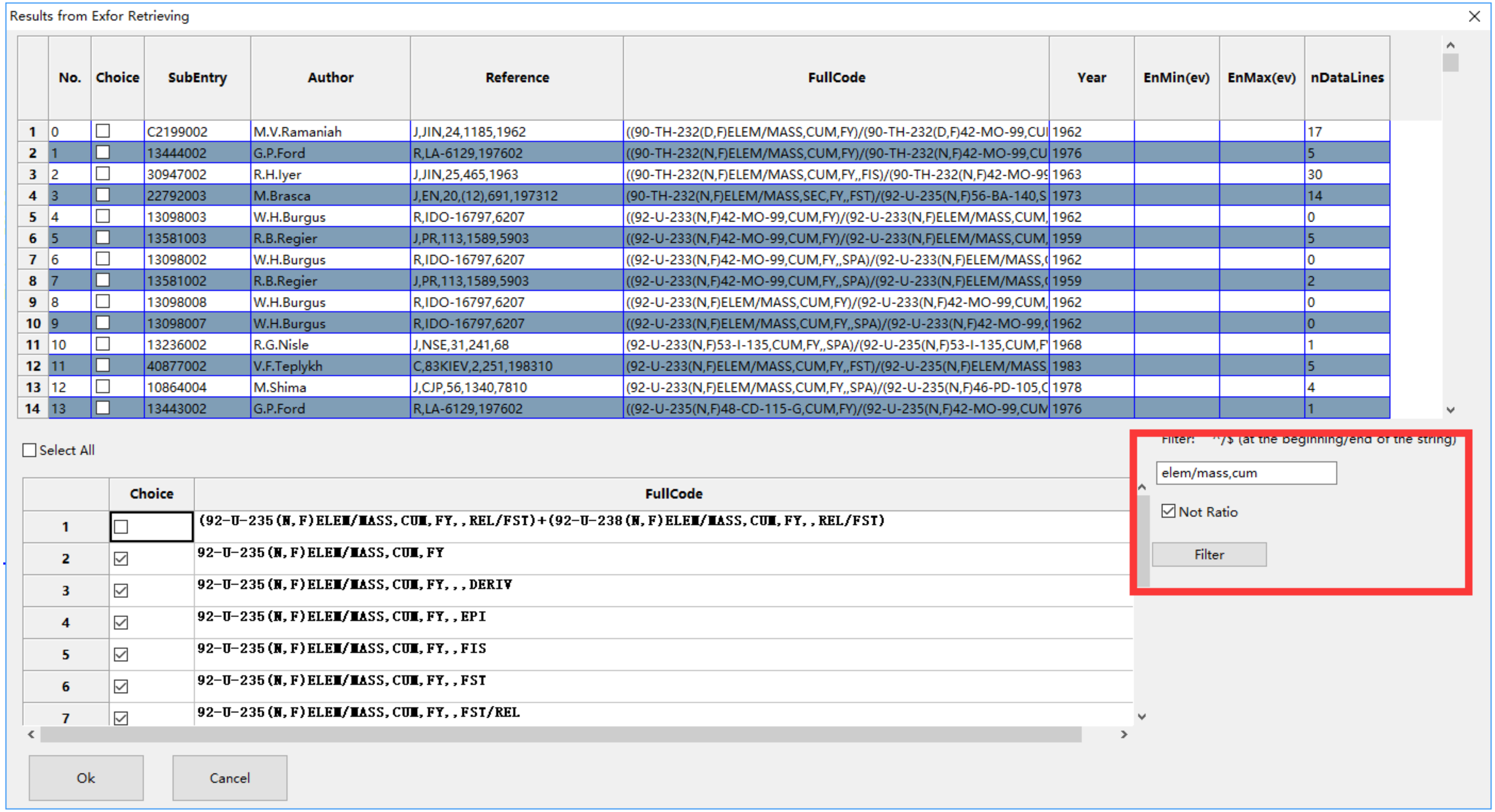
	Choice	FullCode
1	☐	(92-U-235(N,F)ELEM/MASS,CUM,FY,,REL/FST)+(92-U-238(N,F)ELEM/MASS,CUM,FY,,REL/FST)
2	☑	92-U-235(N,F)ELEM/MASS,CUM,FY
3	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,,DERIV
4	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,EPI
5	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FIS
6	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST
7	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST/REL

Filter: ^/$ (at the beginning/end of the string)

elem/mass,cum

☑ Not Ratio

Demonstrations：Yield Energy Independence



	No.	Choice	SubEntry	Author	Reference	FullCode	Year	EnMin(ev)	EnMax(ev)	nDataLines
1	0	☐	C2199002	M.V.Ramaniah	J,JIN,24,1185,1962	((90-TH-232(D,F)ELEM/MASS,CUM,FY)/(90-TH-232(D,F)42-MO-99,CU	1962			17
2	1	☐	13444002	G.P.Ford	R,LA-6129,197602	((90-TH-232(N,F)ELEM/MASS,CUM,FY)/(90-TH-232(N,F)42-MO-99,CU	1976			5
3	2	☐	30947002	R.H.Iyer	J,JIN,25,465,1963	((90-TH-232(N,F)ELEM/MASS,CUM,FY,,FIS)/(90-TH-232(N,F)42-MO-9	1963			30
4	3	☐	22792003	M.Brasca	J,EN,20,(12),691,197312	(90-TH-232(N,F)ELEM/MASS,SEC,FY,,FST)/(92-U-235(N,F)56-BA-140,S	1973			14
5	4	☐	13098003	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1962			0
6	5	☐	13581003	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY)/(92-U-233(N,F)ELEM/MASS,CUM,	1959			5
7	6	☐	13098002	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1962			0
8	7	☐	13581002	R.B.Regier	J,PR,113,1589,5903	((92-U-233(N,F)42-MO-99,CUM,FY,,SPA)/(92-U-233(N,F)ELEM/MASS,	1959			2
9	8	☐	13098008	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY)/(92-U-233(N,F)42-MO-99,CUM,	1962			0
10	9	☐	13098007	W.H.Burgus	R,IDO-16797,6207	((92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-233(N,F)42-MO-99,	1962			0
11	10	☐	13236002	R.G.Nisle	J,NSE,31,241,68	(92-U-233(N,F)53-I-135,CUM,FY,,SPA)/(92-U-235(N,F)53-I-135,CUM,F	1968			1
12	11	☐	40877002	V.F.Teplykh	C,83KIEV,2,251,198310	(92-U-233(N,F)ELEM/MASS,CUM,FY,,FST)/(92-U-235(N,F)ELEM/MASS	1983			5
13	12	☐	10864004	M.Shima	J,CJP,56,1340,7810	(92-U-233(N,F)ELEM/MASS,CUM,FY,,SPA)/(92-U-235(N,F)46-PD-105,C	1978			4
14	13	☐	13443002	G.P.Ford	R,LA-6129,197602	((92-U-235(N,F)48-CD-115-G,CUM,FY)/(92-U-235(N,F)42-MO-99,CUM	1976			1

☐ Select All

	Choice	FullCode
1	☐	(92-U-235(N,F)ELEM/MASS,CUM,FY,,REL/FST)+(92-U-238(N,F)ELEM/MASS,CUM,FY,,REL/FST)
2	☑	92-U-235(N,F)ELEM/MASS,CUM,FY
3	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,,DERIV
4	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,EPI
5	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FIS
6	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST
7	☑	92-U-235(N,F)ELEM/MASS,CUM,FY,,FST/REL

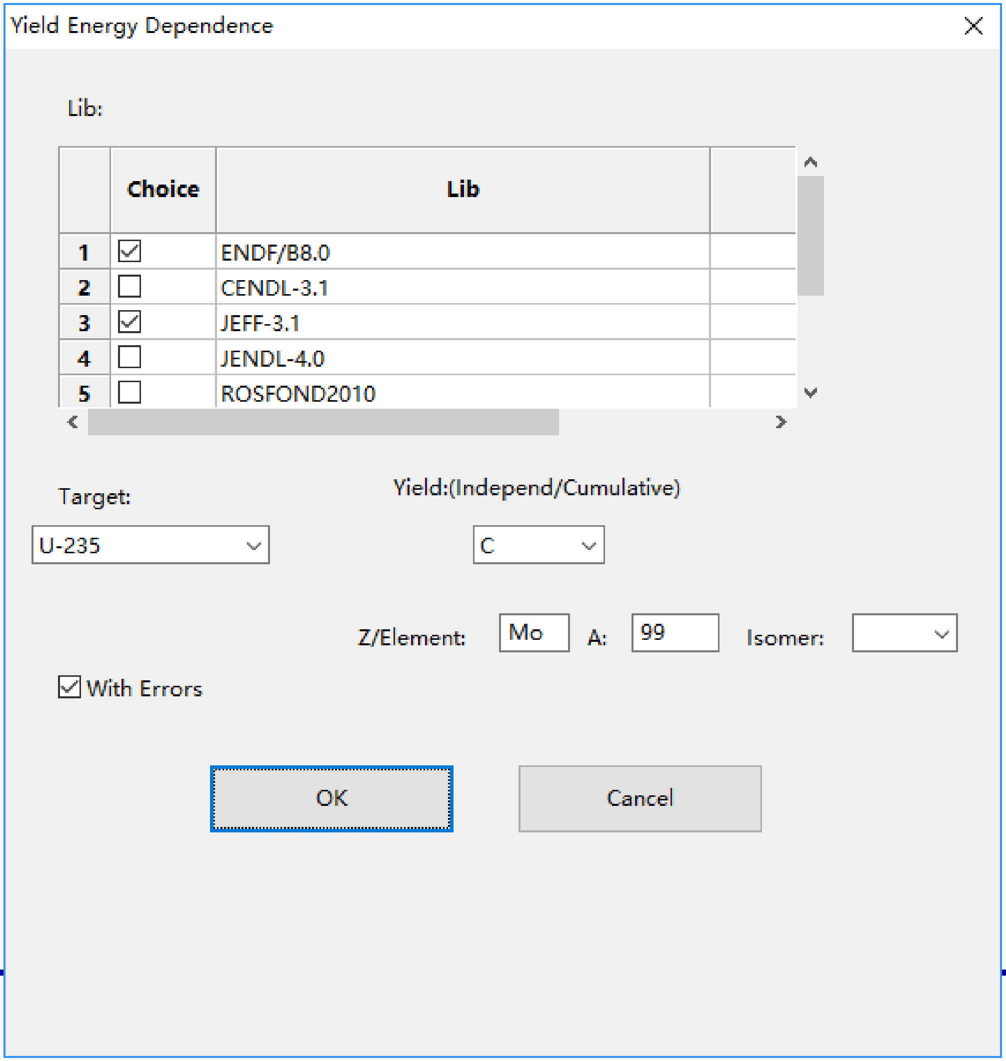
Filter: ^/$ (at the beginning/end of the string)

elem/mass,cum

☑ Not Ratio

Demonstrations：Yield Energy Independence

Evaluated Data



Yield Energy Dependence

Lib:

	Choice	Lib	
1	☑	ENDF/B8.0	
2	☐	CENDL-3.1	
3	☑	JEFF-3.1	
4	☐	JENDL-4.0	
5	☐	ROSFOND2010	

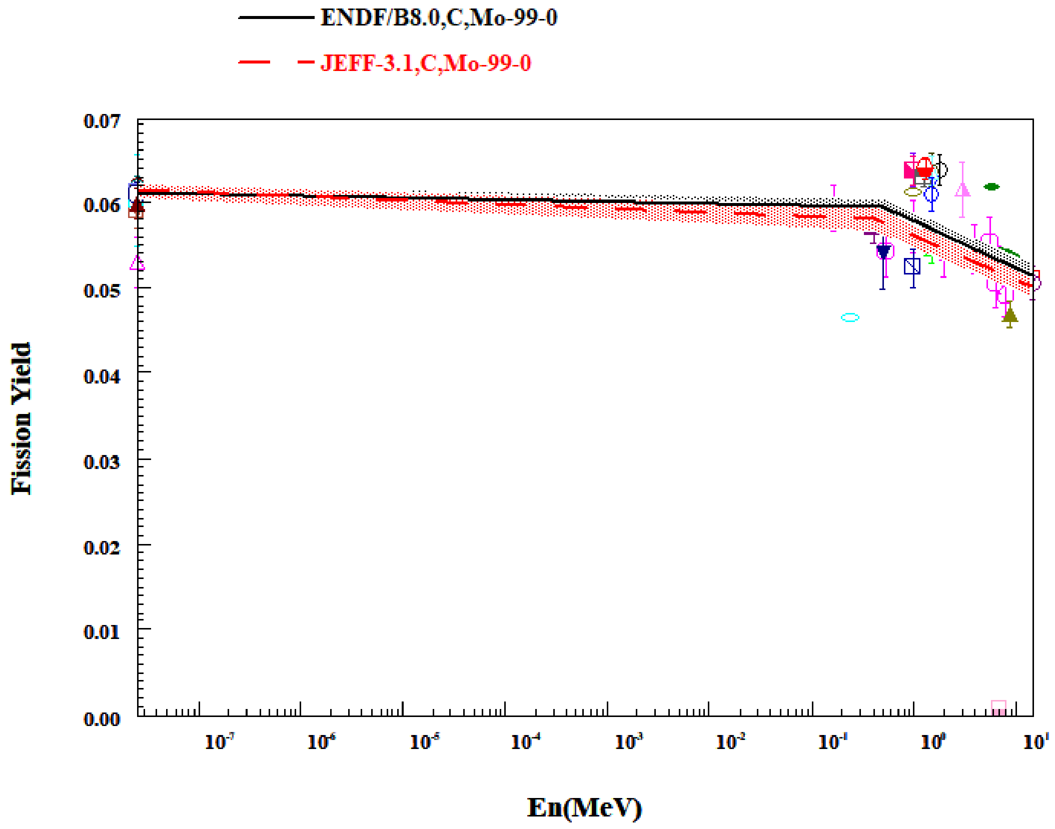
Target: U-235

Yield:(Independ/Cumulative) C

Z/Element: Mo A: 99 Isomer:

☑ With Errors

Demonstrations：Yield Energy Independence



Summary

- NDPlot is an efficient plotting software for nuclear data and easy to use.

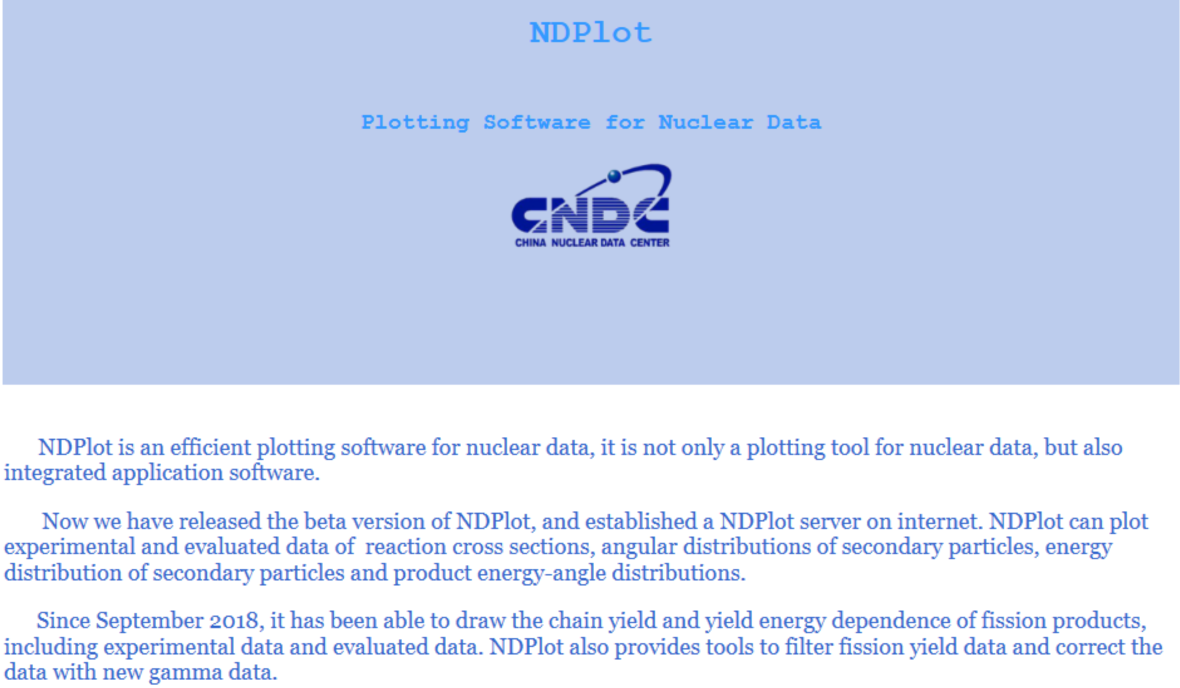
- It can be All-in-one (information)

- The Work base on EXFOR database and some tools provided from NDS. Thanks to NDS and IAEA, especially Thanks to Viktor ZERKIN.

Prospect

- New function such as correction exp. Data with standard cross sections
- Low network speed should be considered.
- More friendly human-machine interface

Website: http://www.nuclear.csdb.cn/ndplot/



NDPlot

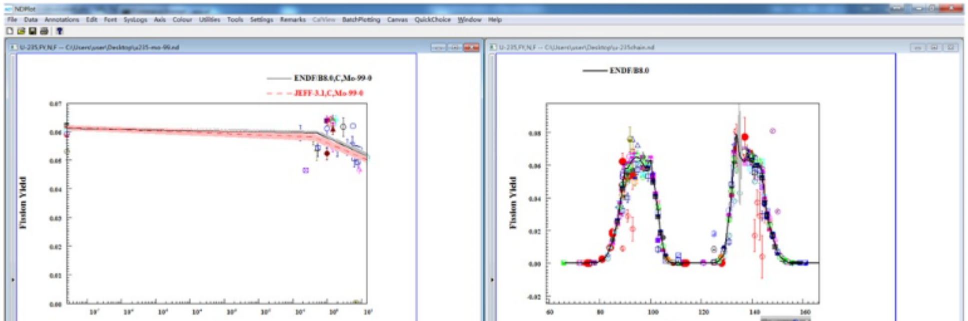
Plotting Software for Nuclear Data

CNDC CHINA NUCLEAR DATA CENTER

NDPlot is an efficient plotting software for nuclear data, it is not only a plotting tool for nuclear data, but also integrated application software.

Now we have released the beta version of NDPlot, and established a NDPlot server on internet. NDPlot can plot experimental and evaluated data of reaction cross sections, angular distributions of secondary particles, energy distribution of secondary particles and product energy-angle distributions.

Since September 2018, it has been able to draw the chain yield and yield energy dependence of fission products, including experimental data and evaluated data. NDPlot also provides tools to filter fission yield data and correct the data with new gamma data.


NDPlot
File Data Annotations Edit Font SysLogs Axis Colour Utilities Tools Settings Remarks CalView BatchPlotting Canvas QuickChoice Window Help
ENDF/B8.0,C,Mo-99-0
JEFF-3.1,C,Mo-99-0
Fission Yield
ENDF/B8.0
Fission Yield

Thank you for your attention !

China Nuclear Data Center
China Institute of Atomic Energy
P.O.Box 275-41, Beijing 102413, P.R.China

References

- **<<Programming Perl>> Larry Wall,O’REILLY**
- **Web site: http://www-nds.iaea.org**
- **Web site: http://www.wxwidgets.org**
- **Web site: https://www-nds.iaea.org/public/endf/prepro/**
- **Web site: https://www-nds.iaea.org/public/endf/endver/**