### **ON NEW FEARTURES OF THE EXFOR-EDITOR**

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### **Task Definition:**

To enhance functionality of the EXFOR-Editor program on preparation of the following information for the EXFOR library:

- exchange files with experimental data of nuclear reactions;

- numerical data on incident neutron spectra, or resolution or response function according to the new EXFOR rules.

#### **Exchange File Processing**

### STEP 1. Switch on the TRANS file edit mode

Click the program icon or run **ExfData4\_01.EXE** from the program directory to launch the **ExfData**.

To enable the TRANS file edit mode switch on the **TRANS Mode** flag in the menu of the program main window

Nuclear Data Compilation into EXFOR Format Version 4.01
 TRANS File Edit Processing Tools Help | ENTRY Mode | 

 TRANS Mode |

# **STEP 2. Create a new TRANS file (one of possible ways)**

<u> </u> <u>TRANS File</u> Click the **TRANS File** tool button on the tool panel of the main window or select the **TRANS File**|New|TRANS File menu item.

TRANS File Name
Prelim 
F999

In the New TRANS window in the TRANS Number field perform the following operations:

- select a new file type from the drop-down list: **PRELIM** or **TRANS**;

- input a four-character file identification;

.TXT.

- input a filename extension (optional item).

Selected Entries
C F1257.EXF
🗆 F1305.exf
🗆 F1346.exf

The **Selected Entries** group box initially contains a list of Entries opened in the **ENTRY Mode**.

Add Entries

Use the Add Entries button to include additional Entries into the list. Then select necessary Entry filenames saved on a hard disk in the Select Entries for TRANS window.

Mark ENTRY filenames for a new TRANS in the **Selected Entries** list and click the **OK** button. A new EXFOR Exchange File should be created in the main window of the **TRANS Mode**. Check and correct this file.

# Step 3. Process the EXFOR Exchange File by the Editor

Use a tree structure on the left side of the main window to navigate through the opened EXFOR Exchange File. The tree structure contains a list of Entries, Subentries and Sections of this file.

🟶 Nuclear Data Compilation into EXFOR Format Ve	ersion 4.01					-	- 🗆	×
TRANS File Edit Processing Tools Help	ENTRY Mode	<ul> <li>TRANS Mode</li> </ul>	:					
🗋 🗅 🖶 🖬 👘 🗠 🗠 🗠 🗠	n. <b>3</b> .	🤋   🗢   🤋	Use	e 67-80 Columns				
選 <u> 下RANS File</u> Add Entry				Order Chec	k <u>Checker</u>			
TRANS File Structure	-C:\MyProgram	ns\Delphi2007\E	XFOR\EXFOR	REditor\PrelimF9	1999.TXT			<u></u>
X	Column: 12	Row: 3 Tota	al: 10546 Inse	ert C:\My	Programs\Delphi	2007\EXFOR\EXF	OREditor\P	relimF99
E- TRANS F9999	TRANS	F9999	2022102	0				^
ENTRY F1257	ENTRY	F1257	2015052	0				
E SUBENT F1257001	SUBENT	F1257001	2015052	0				
	BIB	12	4	2				
	TITLE	High-precisi	ion measur	ements of th	e pion-proto	on		
ENDSUBENT 52		elastic dif	ferential	cross sectio	ns in the se	cond		
E SUBENT F1257002		resonance re	egion.					
	AUTHOR	(I.G.Aleksee	ev,V.A.And	reev,I.G.Bor	dyuzhin,W.J.	Briscoe,		
		Ye.A.Filimor	nov,V.V.Go	lubev,A.B.Gr	idnev,D.V.Ka	alinkin,		
		L.I.Koroleva	a,N.G.Kozl	enko,V.S.Koz	lov,A.G.Kriv	/shich,		
ENDDATA		B.V.Morozov,	V.M.Neste	rov, D.V.Novi	nsky,V.V.Ryl	ltsov,		
ENDSUBENT 4650		M.Sadler,B.M	1.Shurygin	,I.I.Strakov	sky,A.D.Suli	lmov,		
SUBENI F125/003		V.V.Sumachev	7,D.N.Svir	ida,V.I.Tara	kanov,V.Yu.I	frautman,		
		R.L.Workman)						
	INSTITUTE	(4RUSITE, 1US	SAGWU, 4RUS	LIN)				
- E DATA		(1USAUSA) Ak	oilene Chr	istian Unive	rsity,Abiler	ne,USA		
		(4RUSRUS) Na	ational Un	iversity of	Science and			
ENDSUBENT 5205		Technology	'MISIS",Mo	scow, Russia				
E ENTRY F1305	REFERENCE	(J, PR/C, 91, 0	25205,201	5) Final dat	a			
🖨 🛃 <u>SUBENT F1305001</u>		#do1:10.110	3/PhysRevC	.91.025205				
- E BIB		(J,FCY,45, (	1),107,201	4) Prelimina	ry data			
- E ENDBIB		(J, PPN, 45, ()	1),66,2014	) English tr	anslation			
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BUBENT F1305002	REL-REF	(I,,I.AIEKS	TEN THO I	TED 10 CoV p	voton ovnahr	otron		
- E <u>BIB</u>	TNC-SOURCE	The secondar	v nion be	am line of t	he ITER prot	on		
	INC SOURCE	synchrotron	ry pron be	um IInc of d	ne iibi piot	.011		
	SAMPLE	Liquid hydro	Dgen place	d into mylar	reservoir	(40 mm in		
ENDDATA		diameter and	1 250 mm 1	ength along	the beam) wa	s used as		
ENDSUBENT 63		a target.			,			
E SUBENT F1305003	DETECTOR	(DRFTC) Two	chambers	closest to t	he target ha	ive a		
ENDBIB		sensitive an	cea 600*40	0 mm2. Six o	ther chamber	s have		
E COMMON		sensitive a	rea 1200*8	00 mm2. Aga	s mixture of	70% Ar		
- E DATA		and 30% CO2	is used in	n the drift	chambers. Se	election		
	1							× *
ENDSUBENT 14	1	112	23	134	45	156	67	/
		1.16	20	1.54	1.10	1.30	1.07	

Add Entry File.

Click the Add ENTRY button on the tool panel of the main window or select the TRANS File|Add Entry menu item to add Entries to the Exchange

# Step 4. Order the Exchange File records according to the EXFOR rules

I∏ <u>Order</u> Add record identification to the Exchange File according to the EXFOR rules: click the **Order** button on the tool panel of the main window or select the **Processing|Order** menu item. A result of ENTRY ordering is presented on the next Figure.

TRANS F9999 20221020 F0000 0 0	Causa	
INTRY F1257 20150520 F1257 0 1	Save	
UBENT F1257001 20150520 F1257 1 1		1
31B 12 42 F1257 1 2	Close	
TILE High-precision measurements of the pion-proton F1257 1 3		1
elastic differential cross sections in the second F1257 1 4		
resonance region. F1257 1 5		
AUTHOR (I.G.Alekseev, V.A.Andreev, I.G.Bordyuzhin, W.J.Briscoe, F1257 1 6		
Ye.A.Filimonov,V.V.Golubev,A.B.Gridnev,D.V.Kalinkin, F1257 1 7		
L.I.Koroleva, N.G.Kozlenko, V.S.Kozlov, A.G.Krivshich, F1257 1 8		
B.V.Morozov,V.M.Nesterov,D.V.Novinsky,V.V.Ryltsov, F1257 1 9		
M.Sadler, B.M.Shurygin, I.I.Strakovsky, A.D.Sulimov, F1257 1 10		
V.V.Sumachev,D.N.Svirida,V.I.Tarakanov,V.Yu.Trautman, F1257 1 11		
R.L.Workman) F1257 1 12		
INSTITUTE (4RUSITE, 1USAGWU, 4RUSLIN) F1257 1 13		
(1USAUSA) Abilene Christian University, Abilene, USA F1257 1 14		
(4RUSRUS) National University of Science and F1257 1 15		
Technology "MISiS", Moscow, Russia F1257 1 16		
REFERENCE (J.PR/C.91.025205.2015) Final data F1257 1 17		
#doi:10.1103/PhysRevC.91.025205 F1257 1 18		
(J.FCY.45.(1).107.2014) Freliminary data F1257 1 19		
(J.PPN, 45, (1), 66, 2014) English translation F1257 1 20		
#doi:10.1134/S1063779614010055 F1257 1 21		
REL-REF (I. I. Alekseevt J. NIM/A. 578, 289, 2007) F1257 1 22		
ACTILITY (SYNCH 4RUSITE) The ITEP 10-GeV proton synchrotron F1257 1 23		
NC-SOURCE The secondary pion beam line of the ITEP proton E1257 1 24		
supercharge F1257 1 25		
AMPIE Liquid budrogen placed into mular reservoir (40 mm in F1257 1 26		
diameter and 250 mm length along the beam) was used as F1257 1 27		
a target		
ETECTOR (DEFTC) Two chambers closest to the target have a F1237 1 29		
consisting area 600×400 m2 Six other charbers have F1257 1 20		
consistive area 1200-400 mm2, are other chambers have $r_{1257}$ 1 30		
and 20% CO2 is used in the drift charbers Calection F1257 1 31		
and solve core is used in the diffit chambers. Selection (F125) 1 32	Help	
c	nop	

Step 5. Check the Exchange File according to the EXFOR format rules



**Processing** Check menu item to launch the ZChex program (developed by

V.Zerkin, NDS, IAEA).

Look through the results shown on the lower panel of the main window and make the necessary corrections. Click on the row containing an error description to highlight the wrong record. Correct all errors and warnings and get the message about zero error.

+≣ Checker

Click the Checker button on the tool panel of the main window or select the Processing Checker menu item to launch the Trans Checker program (developed by N.Soppera, NEA Data Bank).

The results are shown in the table on the lower panel of the main window. Click on the row containing an error or warning description to highlight the wrong record. Correct all errors and warnings and get the message about zero error.

r	Errors for C:\MyP	rograms\Delp	hi2007\EXFOR\EXFOREditor\PrelimF9998.TXT			
	Statistics ERRORS:	2	WARNINGS: <u>0</u>			
	Error Type	SUBENTRY	Error Message	Details	Line	
	EXCEPTION	nulinuli	Expected blanks	TRANS record, columns 12-18 [ F9998 202]	0	
	EXCEPTION	nulinuli	Missing closing system identifier		1	

After correction of all errors, the exchange file is ready for the EXFOR library.

Processing of Numerical Data on Incident Neutron Spectra, Resolution or **Response Function according to the New EXFOR Rules** 

Step 1. Use the pattern mode to create SUBENTRY with the SUPPL-INF keyword

# SUBENTRY SUPPL-INF

Click the <u>SUBENTRY SUPPL-INF</u> button on the tool panel of the main window or select the <u>Sections|Subentry SUPPL-INF</u> menu item in the ENTRY mode of the EXFOR-Editor:

ENTRY File Sections Keywords Edit Processing Tools Help | 🖌 ENTRY Mode

The next window there will appear:

😽 Wizard of Subentry with Supplemental Information	2		×
BIB Section	ن-		23746 exf
Code (Dict.16) Free Text		^	SUBENT Number
STATUS TABLE -		~	003
Code (Dict.38) Free Text			SUBENT Input Options
SUPPL-INF INCSP -		^	After Current SUBENT
Col Number of a		×	C End of File
Col.Nulliber Col.# Dat	a Title & Data Units	Precision	
		VES	
2.		125	
Selected Column: 1 Selected Row: 1 Tot	al: 1 Data		
Col. 1: Col. 2:	Import	Sort	
1	Paste	Chart	
		Clear	
	Column		
	Set Value	e Calculate	
	Precision	Check	
	Copy	Clear	
	Bow		
	Add	Insert	
	Сору	Delete	
	Move Up	Move Down	
	Export	Undo	
HISTORY Date Code (Dict.15	) Free Text		ОК
✓ Use 20221207 ✓		\$	Cancel

### Step 2. Input of data for the SUPPL-INF Subentry keywords

Select a code from the drop-down list of the Code field for the STATUS

keyword.

Free Text Fig.20(b) of Nucl.Instr.Meth.A1003(2021)165318
Data were obtained from AUTHOR fie

Input additional information into the Free Text field if necessary.

Switch on the Use flag to enable the HISTORY keyword use.

-Code	(Dict.15)
R	•

HISTORY

Use

Code (Dict.16)

•

TABLE

Select a code from the drop-down list of the Code field.

Date	
20221021	-

Input the date of the SUBENTRY creation into the Date field.

Free TextInput additional information into the Free Text field,Data were recieved from AUTHORif necessary.

### Step 3. Input of data for the SUPPL-INF keyword



Select a code from the drop-down list of the **Code** field.

Free Text 23.5 keV filtered neutron spectrum (Fe 20cm) calculated by the Monte-Carlo simulation code PHITS. Input additional information into the Free Text field, if necessary.

Set the number of numerical data columns in the **Col.Number** field. Input the data titles and their units for every numerical data column in free text into the **Data Title & Data Units** column.

Col.Number	Col.#	Data Title & Data Units	Precision
2	1:	Neutron energy (eV)	YES
· · · · · ·	2:	Relative neutron intensity (per energy)	YES

Set the **YES** code in the **Precision** column to enable numerical data formatting with precision setting. Set the **NO** code to save the author's numerical data presentation.

Use the Data Table mode to input numerical data for the SUPPL-INF keyword.

Paste

Select data in any file and put them into the clipboard (Copy). Use the **Paste** button on the **Data** panel.

Paste			×	<
Separator	Clipboard Context:	Refresh Context	Trim Left Spaces	
· ● <space> · ○ &lt;:&gt; - Semi</space>	h 74810	4 0 00008100		_
C <tab> C Another String</tab>	1 78F+0	4 3 6229F+03		ì
C <.> - Comma	1.82E+0	4 1.6003E+05		
· · · · · · · · · · · · · · · · · · ·	1.86E+0	4 2.3098E+05		
	1.90E+0	4 2.8200E+05		
	1.94E+0	4 4.0978E+05		
l ine End	1.98E+0	4 8.4756E+05		
	2.02E+0	4 1.0844E+06		
	2.06E+0	4 1.4047E+06		
○ <lf></lf>	2.10E+0	4 1.6991E+06		
Destination Table	2.142+0	4 2.9752F+06		
	2.22E+0	4 3.8573E+06		
Start Column Number: 1 🗧	2.26E+0	4 5.0179E+06		
	2.30E+0	4 6.8988E+06		
Start Row Number: 1	2.34E+0	4 8.9683E+06		
	2.38E+0	4 1.1188E+07		
Add to End of Table	2.42E+0	4 1.2276E+07		
Paste Regime	2.46E+0	4 1.2177E+07		
Insert New Rows	2.50E+0	4 9.0053E+06		
Replace Rows	2.542+0	4 5 31128±05		
<u></u>	2.62E+0	4 5.8190E+03		
	2.66E+0	4 6.3347E+00		
OK Cancel	2.70E+0	4 0.0000E+00		
			Y	1

Set the following options for numerical data input in the **Paste** window: chars used as data separators in text (group-box **Separator**), chars used as signs of the line end (group-box **Line End**), column number and row number for the beginning of data insertion (fields **Start Column Number** and **Start Row Number**). Switch on the **Add to End of Table** flag to add numerical data to the end of the table.

Click the **Refresh Context** button on the **Clipboard Context** panel to refresh the representation of the clipboard context on the screen. Click the **Trim Left Spaces** button to delete left spaces in every line of the clipboard context.

Clipboard Context: Refresh Context	Frim Left Spaces
------------------------------------	------------------

Click the **OK** button to rewrite numerical data from the clipboard to the table.

#### Step 4. Processing of numerical data

All operations of the **Data Table** mode are available for processing of the **SUPPL-INF** numerical data.

The DATA panel contains the following buttons:

- **Import** - to import numerical data from text files, Word or Excel files;

- Paste - to paste numerical data from the clipboard;

- Clear - to clear data table;

- **Sort** - to sort numerical data by columns in ascending order;

- Chart - to present numerical data in graphical output;

The **Column** panel contains the following buttons to process the selected column:

- Set Value - to input a constant value;

- Calculate – to make calculations with numerical data;

- **Precision** - to set format and precision of numerical data;

- Check - to check correctness of numerical data;

- Copy - to copy data from one column to another;

– Clear – to clear numerical data from the column.

The **Row** panel contains the following buttons to process the data from rows:

- Add or Insert – to input row at the end of table or at selected position;

- Copy - to make a copy of selected row;

- **Delete** - to delete rows;

- Move Up or Move Down - to move the selected row up or down by one position.

The Table panel contains the following buttons:

- Undo - to cancel the last operation with numerical data;

- **Export** - to export numerical data into a text file or Word or Excel table.

The format and precision are set for the numerical data from the whole of the selected column. Numerical data could be presented as integer values or fractional decimal values (with fixed or floating point).



Data				
Import	Sort			
Paste	Chart			
Clear				
Column				
Set Value	Calculate			
Precision	Check			
Сору	Clear			
Row				
Add	Insert			
Сору	Delete			
Move Up	Move Down			
Table				
Export	Undo			

7

Use graphic presentation for additional check of numerical data. Select the table columns for axes to make a plot in the Data Chart (SUPPL-INF) window and click the Plot button.



# **Step 5. Insert SUPPL-INF SUBENTRY into the ENTRY**

SUBENT Number	-
003	
SUBENT Input Options	
After Current SUBEN	ŗ
C End of File	

Set the subentry number in the SUBENT Number field and determine the place of the SUPPL-INF subentry insertion in the SUBENT Input Options group-box: right after current subentry or at the end of the entry. Click the **OK** button.

Repeat steps  $3 \div 5$  to input the SUPPL-INF keyword information separately (the SUPPL-INF button on the tool panel of the main window or SUPPL-INF Keywords Physics SUPPL-INF menu item).

### Additional comments on some corrections

Use the User's Format option in the Text Input **Regime** group-box to save the author's formatting of text information for input of keywords data (all spaces will be saved).

DECAY-, Text Input Re ) Compress User's For Spell Ch Compress Clear

Text will be inserted without any transformation

,	DECAY-DATA	(47-AG-111-	G,7.45D,DG,	245.4,0.0124,
			DG,	342.13,0.067)

This option is available for all keywords.

DATA	(47-AG-111-G,7.45D,DG,245.4,0.0124
gime	DG,342.13,0.067
mat	
eck	