

Software for input, processing and recording factographic data in the EXFOR format

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For many years the Nuclear Data Center at INRR has been compiling experimental nuclear reaction data into the international library EXFOR. For convenience of processing initial data there was developed special software. This software package provided the users with the digitization of graphic information, conversion of input values into physics experiment units, calculation of additional parameters.

All these programs were developed at different time, as it was required. Many of the programs have gone out of date and operate under the control of operating system MS DOS.

Having gained some experience with the compilation of nuclear data into the EXFOR format, we have come to a conclusion that it is necessary to develop the universal integral software system with the help of the modern program technologies. It should solve the whole complex of the listed tasks and have some additional functions.

This software is being designed to input and process the data on nuclear reactions obtained as the result of literature source compilation. The program works under the control of operating system WINDOWS 2000 and of higher versions on the personal computer of IBM PC type. It has a general-purpose easy-to-use interface. The program meets the main requirements imposed to processing of factographic data into the files of the EXFOR. It also takes into account the type of source data presentation which can be specified in the form of tables or graphics.

Fig.1 shows the main window of the program package. This window contains a set of menus and functional buttons. The entire sequence of operations on creating a compiled file in the EXFOR format is realized with the help of them. These functions are the following:

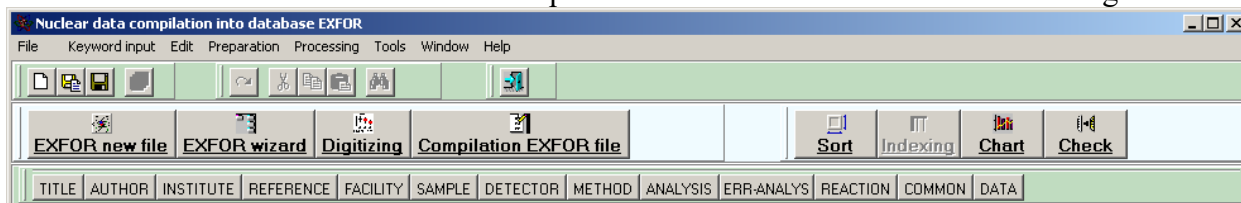


Figure 1 – Main window

- creation of a new file in the EXFOR format with the help of pattern;
- creation of a new file in the EXFOR format by means of wizard. Direct access to the EXFOR dictionaries is provided for simplification of coded information;
- graphic data digitizing. Primary graphic data are entered as files of bitmap format (BMP) obtained by scanning the initial documents;
- calculation of the physics process values in the experiment coordinate scale on the basis of digitized data;
- inserting the obtained digitized data into the EXFOR file;
- editing the EXFOR file. The editor shown in the figure 2 is specially improved to process the files of the EXFOR format. On the left side there is a window containing a structure of opened file in the form of a keyword tree. This tree helps to navigate through the edited file. The editor field is subdivided into columns. The positions of these columns correspond to the EXFOR format requirements. In the bottom of the editor window there is a special rule with column numbers where EXFOR fields begin. Below there is a status bar with the cursor current position. The developed editor have also all standard properties of editors working under operating system WINDOWS;

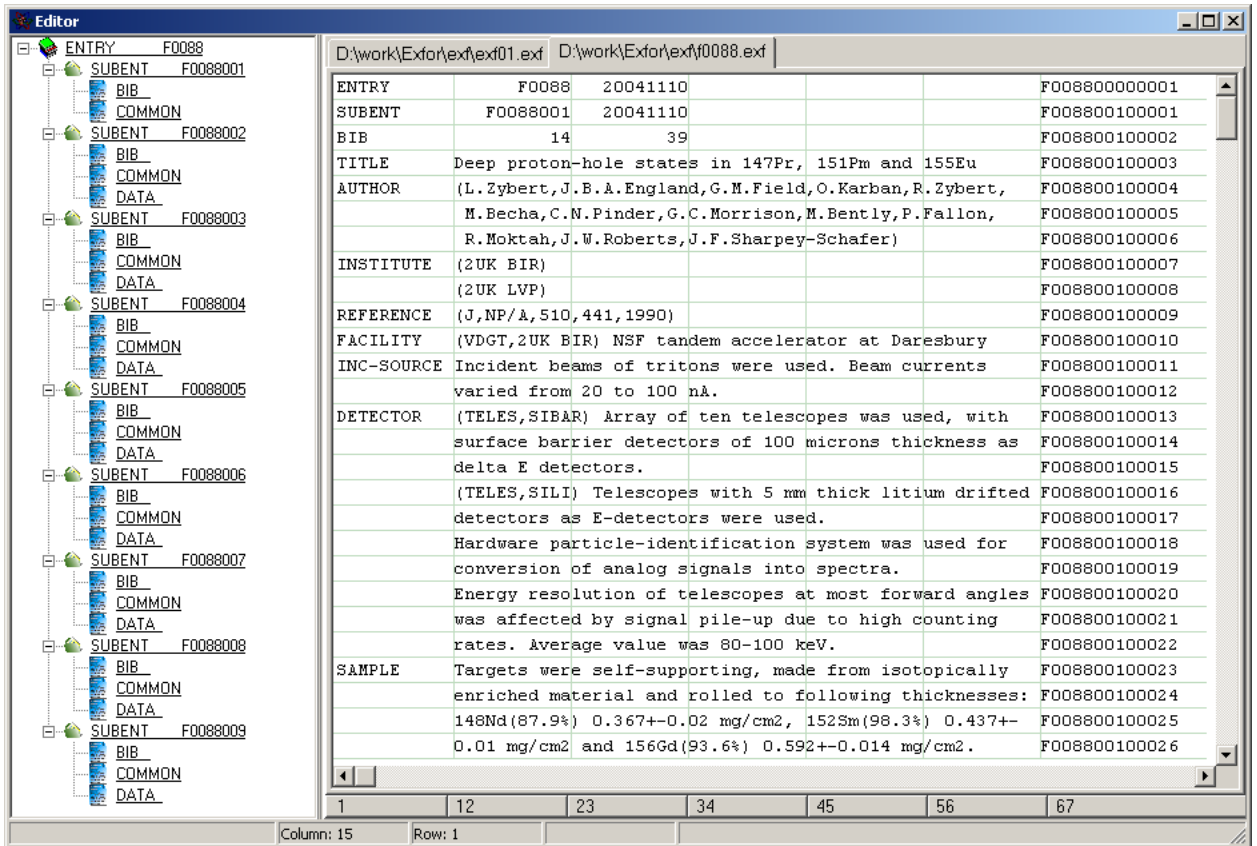


Figure 2 – Editor window

- sort of entered numerical data. Sort of data section by three independent values is realized;
- indexing the edited file records according to the rules of EXFOR record identification;
- plotting data section tables. This function helps to check the input of numeric values. Figure 3 shows the example of such window;

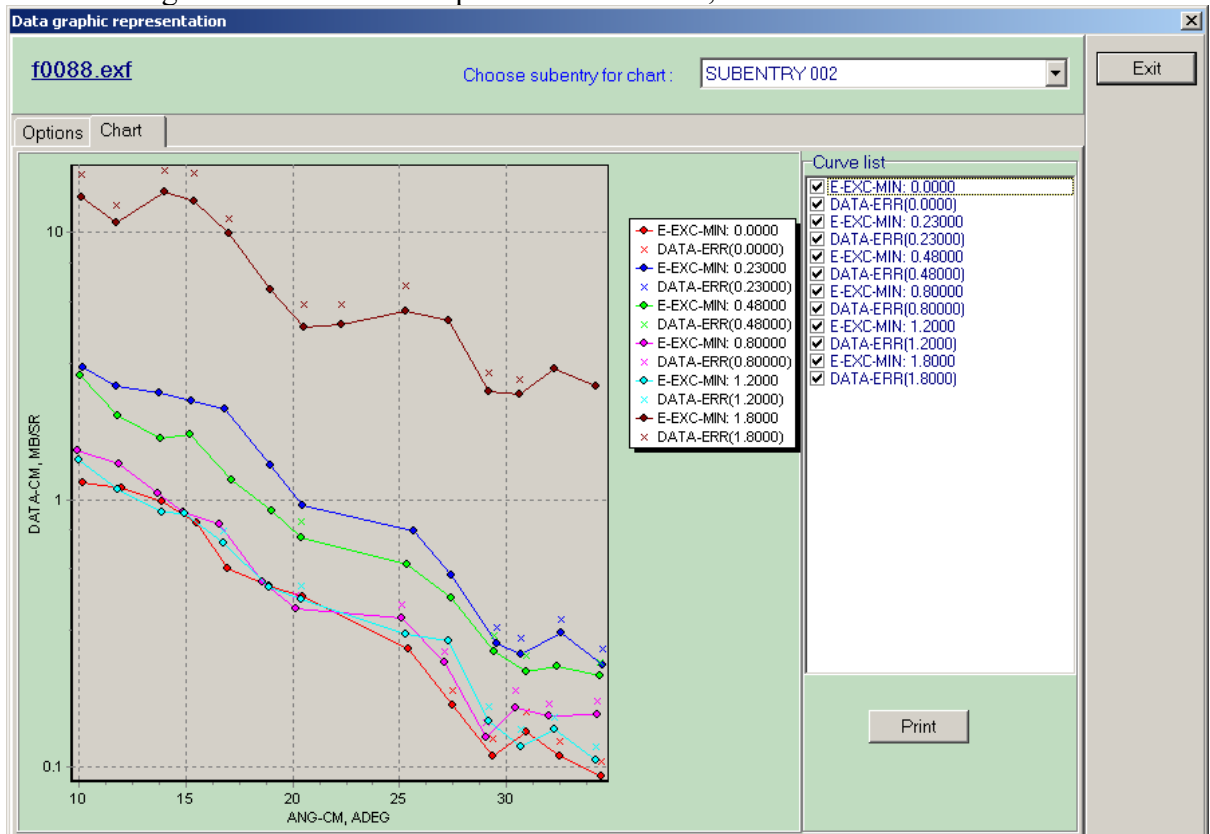


Figure 3 – Window of data graphic representation

- checking the edited file for its correspondence to the EXFOR format.

The listed functions are basic for the developed software package. As additional service the following functions are supposed to be realized into the program package:

- calculation of astrophysical S-factor by the given integral cross-section of nuclear reaction and the reverse procedure;
- increase and decrease of any data table column by a constant or by several times;
- calculation of angle cosine values and the angle itself by the given function COS^2 ;
- extended help system, including a software manual and the coding rules of the EXFOR format;
- automatic search and entry of information-identifier keywords and the structure of the codes associated with them.

At present we work on realization of the listed functions. We are glad to improve the program structure taking into account the users' requests and to consider any critical comments and proposals.

Thus, the developed software, in our opinion, meets the requirements of experimental cross-section and light nucleus interaction data processing and can take the place of the earlier developed software complex.