Development of a new EXFOR editor system

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The International Network of the Nuclear Reaction Data Centers (NRDC)[1] is a worldwide network of nuclear data centers organized under the auspices of the International Atomic Energy Agency (IAEA). NRDC was established to collect experimental data from all over the world, initially addressing the data needs of the fission reactor industry.

The present aim of the NRDC is to encompass all types of nuclear reaction data, including neutron- and charged particle-induced data, as well as photonuclear data. Such data are required for many nuclear applications such as accelerator-driven systems, fusion reactors, nuclear medicine, materials analysis, environmental monitoring, and basic research[2]. Since the early 80s, the Nuclear Reaction Data Centre of Hokkaido University (JCPRG, formerly Japan Charged-Particle Nuclear Reaction Data Group)[3] an active member of the NRDC.

Under the NRDC, experimental nuclear reaction data are compiled in a unified format EXFOR (EXchange FORmat) and stored in the library[4]. EXFOR is the main source of experimental nuclear reaction data and covers results published as early as in the 1930s[2].

In order to make EXFOR compilation easy, various editor systems have been developed within the NRDC community. ANDEX[5] developed by IAEA-NDS (Vienna) and ERES by CNDC (Beijing)[6] are such systems developed in the 1990s. An EXFOR editor developed by CNPD (Sarov) in 2000s is currently used by many EXFOR compilers. In JCPRG, a web-based nuclear data input system HENDEL (Hyper Editor for Nuclear Data Exchange Libraries) was developed for the compilation of experimental nuclear reaction data in EXFOR and NRDF formats[7]. The latter is the original database in JCPRG and is being used as a standard compilation editor system at JCPRG since 2001[8]. For the beginners of EXFOR compilation, the HENDEL system is very useful because it requires only an elementary knowledge of EXFOR. It is now also used by young EXFOR compilers in Kazakhstan and Mongolia. While the current HENDEL system is well designed to create outputs in both NRDF and EXFOR formats, some extra input forms for the creation of NRDF outputs could be rather confusing for foreign compilers. Therefore, development of HENDEL specialized for EXFOR outputs is of our interest.

Recently, we have started to develop a new HENDEL system using the Java programming language for a stand-alone application type. Java is platform independent and an object-oriented programming language. Note that EXFOR compilers emphasized in a recent EXFOR compilation workshop (6-10 Oct. 2014, Vienna) that it is important to develop an OS-independent EXFOR editor system[9].

We adopt Java Swing API for building a GUI (graphical user interface) application. A main page of the new HENDEL editor under development is shown in Fig.#1. Contents of the editor will be organized in a Tree format. The contents of the editor consist: Bibliography, information commonly applied to all data sets of the EXFOR entry (Subentry 001), and information applied to each data set of the EXFOR entry independently (Subentry 002, 003,..). The Bibliography section consists of Title, Author, Affiliation, and Reference. One of the new improvements in this editor is that the Affiliation and Reference part in the Bibliographic section can be multiplied by "+" button, as shown in Fig. 1.

Fig. 1. Bibliography section of a Java-based Hendel system.

In the current stage, the design of the user interface and inclusion of utilities (e.g., checking tools) have been completed.

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