Report on EXFOR Compilation 2018

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Abstract

In this report, we present our recent activities of the compilation of experimental nuclear reaction data. In the fiscal year from April 2018 to March 2019, we compiled 78 new entries and transmitted 13 TRANS files.

1 Introduction

Nuclear reaction data are used in various fields, such as nuclear physics, engineering and medicine. The data can be accessed to a nuclear database through the Internet. The database is constructed in a special format called EXFOR (EXchange FORmat for experimental nuclear reaction data) [1]. The format is designed to accommodate experimental data with corresponding bibliographies and experimental descriptions including error analysis for proper interpretation of the stored experimental data.

EXFOR is maintained by the International Network of Nuclear Reaction Data Centres (NRDC) coordinated by the International Atomic Energy Agency (IAEA) [2]. The NRDC collaborates in the compilation of experimental data and development of related software for compilation and dissemination. The Hokkaido University Nuclear Reaction Data Centre (JCPRG) [3] is a member of NRDC and has contributed about 10% of the charged-particle nuclear reaction data in the EXFOR library. JCPRG provides the compiled nuclear reaction data in both the international (EXFOR) and domestic (NRDF) [4] formats through an online search system.

In this report, we presented our compilation activities of the fiscal year from April 2018 to March 2019.

2 Activity progress

The main task of the JCPRG is to compile charged-particle induced reaction data obtained in Japanese facilities. The following steps are carried out to achieve the task.

- Survey of papers to be compiled from scientific journals
- Compilation of papers in EXFOR format
- Transmission of TRANS files (sets of compiled entries) to IAEA

2.1 Journal Survey

Under collaboration with the NRDC network, experimental data published in scientific journals are continuously surveyed. Sometimes we find some published papers that are not in the scope of EXFOR but are as of NRDF. The lists of the surveyed journals are as follows:

- Physical Review C (PRC)
- Physical Review Letters (PRL)
- Nuclear Physics A (NP/A)
- Physics Letters B (PL/B)
- The European Physical Journal A (EPJ/A)
- Journal of Nuclear Science and Technology (NST)
- Journal of Physics G (JP/G)
- Nuclear Instruments and Methods in Physics Research A (NIM/A)
- Nuclear Instruments and Methods in Physics Research B (NIM/B)
- Progress of Theoretical Physics (PTP)
- Journal of Physical Society of Japan (JPJ)
- Nuclear Science and Engineering (NSE)

2.2 Compilation

In the fiscal year 2018, we compiled 78 new papers and revised 40 entries reporting on nuclear reaction experimental data obtained in Japan. Each new paper is assigned to a compiler. The compiled entries are peer-reviewed by other compilers. For a higher quality of contents and the accuracy of data in the NRDF and the EXFOR library, we contact authors to obtain original numerical data plotted in each figure. In case that the original data cannot be obtained from the corresponding author, we digitize numerical data from the plotted figures with the digitization software GSYS [5].

We have also cooperated with the RIKEN Nishina Center for compilation since 2010. The purpose of the cooperation is to increase the availability of the nuclear reaction data produced at the RIBF. The compiled files of nuclear data produced at the RIBF are translated into the EXFOR format for the benefit of nuclear data users. In the fiscal year 2018, ? papers including the RIBF data were compiled. Therefore, most of the recent experimental nuclear reaction data from the RIBF have successfully been compiled in the EXFOR database.

2.3 Transmitted File in 2018

The most important work is to open EXFOR entries including the experimental nuclear reaction data worldwide. Our compiled entries are transmitted to the NRDC to upload into their servers to public. The transmission includes the new compiled entries as well as the modified entries. In 2018, 13 TRANS files: E112, E113, E114, E115, E116, E117, E118 ,E119, E120, E121, E122, K018 and R029 are submitted to the IAEA. Table 1 represents the TRANS files that include the new as well as modified entries with their accession number. These 13 TRANS files contain 78 EXFOR new entries and 40 modified entries.

3 Summary

We have established an effective procedure to compile all of the new publication reporting experiments performed in Japan. We reported recent compilation work in the JCPRG in this article and summarized the status of the EXFOR file transmission: the 13 TRANS files, named as E112, E113, E114, E115, E116, E117, E118 ,E119, E120, E121, E122, K018 and R029 were transmitted in fiscal year 2018.

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参考文献

[1] http://www.jcprg.org/exfor/

[2] http://www-nds.iaea.org/

[3] http://www.jcprg.org/

[4] http://www.jcprg.org/nrdf/

[5] http://www.jcprg.org/gsys/

Table 1: The list of transmitted new and revised entries in 2018

TRANS	Prelim	Final	Entry New	Entry Rev
E112	2018.03.05	2018.04.25	E2516 E2542 E2549 E2561 E2562	
E113	2018.03.10	2018.04.25	E2526 E2528 E2529 E2530 E2531 E2532 E2533 E2536 E2537 E2538 E2548 E2551 E2554 E2563	
E114	2018.03.14	2018.04.25	E2505 E2510 E2512 E2513 E2517 E2519	
E115	2018.03.28	2018.05.01	E2344 E2351 E2383 E2386 E2387 E2390 E2393 E2568	
E116	2018.08.11	2018.10.04	E2520 E2525 E2541 E2543	
E117	2018.10.22	2018.11.29	E2557 E2574 E2575 E2576 E2578 E2580 E2581	
E118	2018.11.12	2019.01.08	E2524 E2535 E2545 E2553 E2564 E2589	E1921 E2434 E2568
E119	2018.12.20	2019.01.21	E0078 E2218 E2236 E2265 E2266 E2267 E2268 E2270 E2271 E2275 E2276 E2277 E2278 E2301 E2302	
E120	2018.12.22	2019.01.22	E2269 E2374 E2381 E2394 E2591 E2593	E0030 E1917 E2049 E2125 E2430 E2493
E121	2018.12.31	2019.01.31	E2253 E2258 E2583 E2584 E2586 E2590 E2592	E2539
E122	2019.01.25	2019.03.19		E0029 E0832 E0838 E1154 E1294 E1399 E1669 E1677 E1748 E1829 E1846 E1910 E1974 E2007 E2036 E2074 E2089 E2091 E2434
K018	2019.01.18	2019.02.23		K2003 K2004 K2199 K2348
R029	2019.01.21	2019.02.23		R0007 R0017 R0019 R0029 R0031 R0037 R0039
Total			78	40