

JCPRG-RNC joint workshop on nuclear data

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The Hokkaido University Nuclear Reaction Data Centre (JCPRG)¹⁾ and RIKEN Nishina Center established a collaborative research contract in 2010 to increase the availability of the nuclear reaction data produced at the RIBF. Under the collaboration, the data from the RIBF are compiled into two databases, Nuclear Reaction Data File (NRDF) and the EXFOR library. The former is the JCPRG original database and the latter is maintained by the International Network of Nuclear Reaction Data Centres (NRDC) under the auspices of the International Atomic Energy Agency (IAEA).

The major part of the compilation process has been well established during the collaboration period of four years²⁾. Furthermore, we are continuously improving the coverage and usability of the data from the RIBF. For such improvements, the first JCPRG-RNC joint workshop on nuclear data was held on August 8-9, 2013 (Fig. 1). Its purpose was to discuss and share information on the following topics:

- (1) Current status and problems of compilation
- (2) Experiments at RIBF
- (3) Usability of nuclear data
- (4) Nuclear data evaluation

In this article, we briefly report on the workshop.

As reported in another article²⁾, in 2013, we compiled 13 papers, which include experimental data from the RIBF. In the compilation, however, there still remain some problems such as the compilation scope, format, and author proofs. The compilation scope depends on the purpose of each database. For instance, the incident particles compiled in NRDF and transmitted from JCPRG to the EXFOR library are restricted to charged nuclei, mesons, and photons. Therefore, at the moment, the electron scattering data with SCRIT is outside the scope. Because of its importance, however, extension of the scope to include the SCRIT data was discussed. In addition, we also discussed the necessity to compile papers published in other than peer-reviewed journals such as proceedings and annual reports. Such papers are also important from the viewpoint of completeness, but in some cases, it is risky to include results of the works under progress in the reports.

As for the format, the two databases were initiated more than 40 years ago; hence, it is difficult to format these databases using the present-day state-of-the-art experiments and physical quantities. Therefore we



Fig. 1. Group photo

discussed the extension of the format for the RIBF experiments. Furthermore, the format must be communicable to authors, as well as readable to nuclear data users. The format is now being constructed using the XML technology, which is both human-readable and machine-readable³⁾. It is necessary to use a human- and machine-readable technology so as to enable the experimentalists in directly inputting the data into the databases and nuclear data users in retrieving the data. Another format for a simulation code PHITS is also requested from a participant.

In addition to the format extension, there is a request to create a new user interface to connect the databases not only with nuclear data users but also with nuclear physics experimentalists. The interface makes it possible for the nuclear data users and the experimentalists to interactively and directly access the databases. We developed an interface using the Webble World technology at the Hokkaido University Meme Media Laboratory⁴⁾.

Nuclear reaction data are useful in many application fields; e.g., nuclear physics, nuclear engineering, and radiation therapy. In the workshop, we focused on two applications, nuclear transmutation and radiation therapy. Two invited talks were devoted to these fields in terms of the nuclear data point of view. We confirm the importance of the fields.

The workshop helped the participants in understanding the present and future status of the RIKEN-JCPRG research collaboration and related nuclear data activities. We continue to exchange valuable information and requests with nuclear data users and experimentalists to improve our activity more effectively.

References

- 1) <http://www.jcprg.org/>
- 2) A. Makinaga et al.: in this report.
- 3) M. Aikawa et al.: in this report.
- 4) <http://cow.meme.hokudai.ac.jp/WebbleWorldPortal/>

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