

1994 NRDC Meeting

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1994 NRDC Meetingは1994年4月25日から27日にパリ郊外のNEAデータバンクで行われた。著者は、日本荷電粒子核反応データグループを代表してこの会議に参加したので、NRDC Meetingの概略、会議の内容の一部の紹介、最後にこの会議との関連で今後の活動に対するコメントをのべる。

この会議は国際原子力機関 (IAEA) が定期的に招集している会議で本来ならば1993年秋に開かれるはずであったが、半年ほど延期になった。この会議は2年ごとに行われるので、この2年間の核反応データセンタネットワークの活動を評価し今後2年間の計画がたてられる。今回の会議には、11の核データセンタ (アメリカ、ロシア3、日本3、中国、ハンガリ、NEA、IAEA) の20名が参加した。日本から参加したのは、日本原子力研究所の菊地氏と理化学研究所の天道氏、それに日本荷電粒子核反応データグループからの千葉と片山であった。

会議の目的は、それぞれの国と地域の核反応データセンター間の協力にあり、IAEA加盟国のデータ利用者に計算機による検索とオンラインや印刷物によるデータセンターサービスを提供することをその活動の目標にしている。主な話題は、

- ・ EXFORシステムによる核反応データの国際的な交換とこのシステムを更に発展させること
- ・ 中性子反応データに対する国際的な索引と書誌目録としてのCINDAシステム
- ・ 迅速で信頼性の高い核反応データのコンパイルとセンターサービスを実現するための負荷分担
- ・ NRDFフォーマットの評価済みデータライブラリの交換と文書化である。なお、カバーするデータの範囲は中性子、荷電粒子と光子によって引き起こされる核反応断面積と関連するパラメータである。

国と地域の核反応データセンターは、核データ利用者の需要に応えるためにIAEAの調整でデータセンターネットワークを構成して、核反応データのコンパイレーション、相互交換と普及で協力している。我々の日本荷電粒子核反応グループはこのネットワークにおいてJCPRGと略称されている。

このネットワークに参加している核データセンターを表1に示す。

表1 The nuclear reaction data centers

NNDC	US National Nuclear Data Center, Brookheaven, USA
NEA-DB	OECD/NEA Nuclear Data Bank, Saclay, France
NDS	IAEA Nuclear Data Section
CJD	Nuclear Data Centre, Obninsk, Russia
CAJad	Nuclear structure and Nuclear Reaction Data Centre, Moscow, Russia
CDFE	Centre for Experimental Photonuclear Data, Moscow, Russia
CNDC	Chinese Nuclear Data Centre, Beijing, P.R. of China
ATOMKI	Nuclear Data Group of ATOMKI Institute, Debrecen, Hungary
RIKEN	Nuclear Data Group, RIKEN Institute of Physical and Chemical Research, Wako-Shi, Japan
JCPRG	Japan Charged-Particle Nuclear Reaction Data Group, Sapporo, Japan
JAERI	Nuclear Data Center of the Japan Atomic Energy Reserch Institute, Tokai-Mura, Japan
(KACHAPAG)	(Karlsruhe Charged Particle Group, Karlsruhe, Germany. このグループの活動は1982年に中止された)

我々、日本荷電粒子核反応データグループはこのネットワークのなかで、日本で生産された荷電粒子核反応データをEXFORフォーマットで交換する役割を分担している。

会議は、最初に各データセンタ等の活動が詳しく報告され、その後二つのセッションに分かれて議論が進められた。二つのセッションの一つはセンター長を含む責任者のセッションで他の一つは技術面に関するセッションである。

第1日目は、オープニングセッションのあと、参加している各データセンタの報告があった。日本荷電粒子核反応データグループからは、管理運営委員会委員長田中に代わって千葉が資料1にある報告をした。このあと、二つのセッションに共通の事項が議論された。第2日目は、センタ責任者と技術スタッフの二つのセッションが並行して行われ、第3日目は、会議の結論と勧告のまとめにあてられた。

センタ責任者のセッションからの結論は、参加データセンタと各センターの責任範囲を定義する文書をネットワーク参加者と相談して用意することであった。会議では、"Coordination of Activities within the International Nuclear Data Community"にある文書(資料2)に合意し、新しい協定案を日程にしたがって準備することになった。

テクニカルセッションでは、EXFOR、CINDAと共通の辞書データベースがあつかわれた。主に扱った問題は、EXFOR/CINDA辞書データベースの改定、辞書とマニュアルの更新、データの修正、新しいデータ交換媒体等であった。

我々に関心のある点をあげると、

- ・荷電粒子核反応データの評価データファイルを確立するという主要な目標を確認されたこと
- ・E010とE011のTRANSテープについてはNDSが要求した修正をして再送すること
- ・新しいデータ媒体として、インターネットのe-mailやftp、PCディスクケットがあげられたこと

である。

以上、第12回NRDC会議の概略を報告した。詳しくは、"Co-ordination of Nuclear Reaction Data Centers, Report on an IAEA Advisory Group Meeting hosted by the NEA Data Bank, Paris, 25-27 April 1994", Edited by O.Schwerer, C.L.Dunford, H.D.Lemmel, July 1994 を参照されたい。

この会議をふまえて、われわれの今後の活動については、核反応データの活動が荷電粒子データ特にその評価に重点が置かれてきており、データ収集に対する要求が厳しくなるのではないかと思われる。技術的な面では、世界的な通信ネットワークの利用、グラフィックスを含むデータ利用サービスに対応する必要がある。

Japan Charged-Particle Nuclear Reaction Data Group

Hajime TANAKA

Chairman of the Executive Committee

Status Report to the Advisory Group Meeting
on the Co-ordination of the Nuclear Reaction Data Centres
From 25 to 27 April 1994

1. Characteristics of NRDF and specific applications

At first, we will give some characteristics of the NRDF database and the activity of the Japan Charged-Particle Nuclear Reaction Data Group (JCPRG). This database is intended to dedicate not only for a technical usage but also for academic usage. The data compiling format of NRDF is designed to compile various kind of data types which increase with the advancement of research work of this field.

The scope of the objects to be compiled in NRDF is not limited to that of one or some particular current applications. It includes all physical quantities measured in one experiment published. For example, NRDF contains recent data of high-energy beam and unstable-nuclei beam experiments more than ordinary angular distribution or cross section data. Therefore the scope of data compiling objects seems wider than EXFOR.

For a specific application, a certain corresponding retrieval system deals with the NRDF database. The NRDF database may be used by various applications with their own retrieval systems. The translation into the EXFOR system is one of such applications of the NRDF database. The Index Database, which will be mentioned later, is another such application. Therefore an application oriented usage will be dealt with a certain retrieval system of the NRDF database. We are compiling all physical quantities of CPND with the NRDF format for the reason.

The activity of JCPRG is supported by the Ministry of Education. In this point, JCPRG differs from other two activities of Japan, which are supported by the Ministry of Science and Technology. The NRDF database is also approved by the Society of Nuclear Physics including experimental and theoretical physicists in Japan.

Japan Charged-Particle Nuclear Reaction Data Group places four duties upon itself:

- (1) Compiling all CPND produced in Japan with NRDF;
- (2) Translating data in NRDF into EXFOR format;
- (3) Making a combined index database for the CPND in both of NRDF and
- (4) EXFOR for the convenience of the customers in Japan;
- (5) Distributing CPND and Promoting utilization within Japan.

2. Organization and members of JCPRG

The JCPRG is organized by two committees and secretariat in order to accomplish above four duties.

Advisory committee:

Yoshinori AKAISHI (Institute for Nuclear Study, Tokyo Univ.)

Yasuhisa ABE (Research Institute for Fundamental Physics,
Kyoto Univ.)

Coordination of Activities within the International Nuclear Data Community

The meeting recognised:

- that the only existing cooperative arrangement (from 1968) is outdated and does not describe the present broad scope of the cooperation in nuclear data,
- the need to formulate a new agreement, reflecting:
 - the widened scope of the present cooperative arrangement,
 - the existing well coordinated efforts,
 - the unique expertise of the various cooperating data centres.
- the difficulties caused by the continuous reduction of resources available to perform the vital work of the centres.
- the need to delineate what expertise individual national data centres provide as effective core activities of the international data effort.
- the urgent need for a clear and concise description of this cooperative activity for review by various administrative bodies.

The meeting recommended:

- that a document be prepared, reflecting the broad scope of current and future network activities,
- that the document include a concise definition of the objective of the nuclear data network and the means by which the cooperative activity will be carried out,
- that the participating centres and their responsibilities be clearly stated,
- that the document would be regularly reviewed and updated to reflect changes in the participating centres and their responsibilities.

The meeting adopted the following timetable for implementing these recommendations:

- comment and suggestions in writing from the participating centres to IAEA and NEA simultaneously by 15th July 1994,
- draft agreement prepared jointly by IAEA and NEA to be circulated to participating centres by 16th September 1994,
- IAEA should convene a meeting in Vienna during the month of October 1994, to prepare the final version of this document and to recommend its distribution and implementation.

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NRDF System Maintenance:

Shigeo MUKAI (Hokkaido Univ.)

Chiba who is a member of the executive committee has a responsibility for translating NRDF data into the EXFOR format, and keeping EXFOR data received and user servicing. Katayama who is also a member of the executive committee is now investigating possibilities and methodology for evaluation of CPND.

3. Recent progress

(1) Compiling CPND produced in Japan

We have been compiling CPND produced in Japan with the NRDF format since 1987 constantly. In 1992 and 1993, we have newly added 65 and 55 entries in the NRDF library respectively. These newly added entries are the ones that were all produced by accelerators in Japan. Main institutes are Tohoku univ., Tsukuba univ., KEK, JAERI, RIKEN, INS, Tokyo-Ins. Tech., RCNP and Kyushu univ.. Almost all CPND produced from these institutes have been stored in NRDF. By March 1994, amount of the data compiled have reached more than 1200 entries (1258) about 57 MB.

(2) EXFOR translation

In 1992 we submitted to NDS TRANS E010. It contains 29 entries, which were converted out from the NRDF library compiled in 1991. In March 1994 we submitted TRANS E011. The TRANS E011 contains 26 entries. These entries were converted out from the NRDF library compiled in 1992. Now, these two TRANS are requested error corrections.

As mentioned above, the NRDF database is including many kind of data, therefore it is not possible to translate all of NRDF data into the EXFOR format. We have been translating only the parts of NRDF data which can be translated.

(3) Index information system of CPND

We have developed a retrieval system for the index information of CPND and installed it in Hokkaido University Computing Center. The ORION Information Retrieval System is employed for the installation. The purpose of this retrieval system is to open the way for the researchers in Japan to get benefits from utilizing the Charged-Particle Nuclear Reaction Data which are compiled and stored in both of NRDF and EXFOR libraries.

The received CPND in the EXFOR format from IAEA have been accumulated to the amount of 30 MB, consisting of about 1500 entries. It may be a part of our responsibility to prepare an access path of utilizing the data as a valuable resource for the research activities in Japan.

So, the index information retrieval system was developed to find EXFOR entries or subentries having specified features. This installation is a trial version to the system on NACSIS-IR (Information Retrieval service of the National Center for Science Information System). In the near future, the system developed will be available on NACSIS-IR in order to be of use to all potential researchers in Japan.

(4) Customer service

We are realizing that Customer services should be emphasized. Our activities have been reported by "NRDF ANNUAL REPORT" to almost all nuclear physicists and some nuclear engineers in Japan since 1988. Each one contains regular reports such as NRDF data compiling, the EXFOR translation and other relating matters, and some topics which may direct our activities in advance.

Picking up some topics from the recent reports, compilation of hypernuclear data is discussed in "NRDF ANNUAL REPORT 91", "Production of nuclear experimental data" and "proton induced reaction data in NRDF" are surveyed in the 92 Report so as to perform evaluation.

4. Computer Facility

We utilize the Hokkaido University Computing Center for the storage and retrieval of NRDF and EXFOR information. The Hokkaido University Computing Center installs with

Hitachi M-880H and S-820/80 computers. These computers are running by MVS or UNIX compatible operating systems.¹ They are also connected to the National Academic Information Network. Therefore researchers of the universities or institutes in Japan can access our NRDF or EXFOR information through the Network.

There are personal-computers or workstations available at our own laboratory or office. They are also connected to a local and the National Academic Information Network. We are able to communicate with each other and others overseas through computer networks.

5. Future of activities

Major tasks that we have a responsibility to do are compiling and storing CPND produced in Japan, and supplying with data service to home users through international data exchange. The activity and organization of JPCRG is based on Nuclear Research Laboratory, Department of Physics, Hokkaido University, which is supported with the regular working budget and administered by the Ministry of Education and Hokkaido University. The organization of JPCRG has got acknowledgment of the Nuclear Research Community in Japan. We are also getting supports from many researches. Therefore our activity will be going forward steadily. We are making effort to perform the matters in hand mentioned below.

(1) CPND Compiling

We estimate the amount of data produced in Japan per year to be about 3 MB. Although almost all CPND produced ever year in Japan are compiled, it is not yet complete. Especially, recent data of unstable nuclear beams at RIKEN and of high-energy experiments at KEK should completely be stored in NRDF.

(2) EXFOR translation

We are now translating only the parts of the NRDF data which can be translated. The EXFOR translation will be continued in this way. As NRDF contains various kind of physical quantities, we will try to increase parts which can be translated into the EXFOR.

(3) Information system of CPND

The current version of the Index Information system include only EXFOR index information. We are also planning to add NRDF index information to this system. The NACSIS-IR is currently not able to accept other than index database. We are intending to install CPND customer service on NACSIS-IR in future when NACSIS will also be able to accept numerical databases.

(4) Customer service

We are developing a new service through National Center for Science Information Systems (NCSIS): Index Information Retrieval System for CPND in both NRDF and EXFOR formats.

(5) Others

We are studying CPND in NRDF in several aspects for evaluation:

- 1) What physical quantities really exist?;
- 2) In the case of choosing Total-Cross-Section, is it feasible to evaluate?, are there sufficient data or energy range?;
- 3) As NRDF data includes also optical potential, are there any data evaluation model, simulation method or code?

We are also planning to make an evaluation system of the nucleosynthesis by using very low-energy data in NRDF.

¹IP Address: "133.50.16.16"; Domain Address: "osf.cc.hokudai.ac.jp"