

「IAEA 1996 年核反応データセンター長会議」報告

Reports on the IAEA Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centres 1996

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Abstract:

We report the discussions and conclusions at the IAEA Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centres held at National Nuclear Data Center (Brookhaven), 3-7 June, 1996.

1996年6月3日から7日にかけて、ブルックヘブン国立研究所において、IAEA主催による核データセンター長会議が行なわれた。我々のグループ (Japan Charged-Particle Reaction Data Group, JCPRG) からは、大西、千葉が出席した。今回の会議は、いわゆる Center Head Meeting であり、基本的には世界における核データの収集、評価、および公布活動についての方針、各国に散らばっている核データ・センターの役割、また、国際核データセンターネットワークの在り方について議論をすることが主たる目的であった。

我々は、管理運営委員会で議論し、採択されたステータス・レポート (資料1) を持って参加し、JCPRGの国際核データセンターネットワーク内での役割、ネットワークの在り方、核データ活動の目的、等について意見を述べることを目的として参加した。Center Head Meeting という性格上、田中、あるいは加藤が本来は参加すべきであるが、大西がこの間アメリカ国内にいたことから、加藤の代理で出席した。また、Technical な面に関する議論もかなりあるため、EXFOR への変換作業を担当している千葉が参加した。

会議はブルックヘブン国立研究所 (New York, USA) 内にある国立核データセンターにて行なわれた。各国の核データセンターからの参加者はアメリカより5名、ロシア・日本より各4名、中国、ハンガリー、ウクライナより各1名であった。これに加えて、国際機関としてIAEAより2名、OECD Nuclear Data Agencyより1名の参加があった (資料2)。

議論の内容は (資料3)、前述のような議論に加えて、Technical な面の議論—例えば高エネルギー重イオン反応データ収集が開始されたが、これについてのコードの追加、など—、また、アメリカ国内での核データネットワーク (U.S. Nuclear Reaction Data Network) の最近の活動報告、特に WWW 上でのデータ公開の試みについての報告などが行なわれた。

我々の活動に関する議論、及び我々の提出した意見は、主として次のようなものがあつた。

1. JCPRG の国際核データセンターネットワーク内での役割

資料4にあるように、日本国内で生産された全ての荷電粒子核反応データの収集、及びこれの EXFOR format への変換が JCPRG の役割であることが確認された。また、日本国内での EXFOR データの公布活動も JCPRG の役割の一つである。

2. 天体核データ反応データベースについて

現在、我々のグループで、新たに天体核反応に dedicate したデータベースの作成を検討中であるが(資料1)、米国でもこれに類するデータベースを構築しつつあり、我々のデータベースの特徴についての議論が行なわれた。我々の目的は、日本国内で活発な研究活動が行なわれている不安定核を含む広い種類の核反応を取り入れることであり、日本の特徴が現れていること、また Working Group 内に(アメリカでのデータベース作成の助言委員でもある)梶野氏、久保野氏を含むことから、同様のデータベースを別々に(無駄に)構築することはない、という2点について述べ、了承された。

3. 核データ活動の目的について

天体核反応データベース、高エネルギー重イオン反応データベースなどの作成からもわかるように、現在核データ活動の目的は変わりつつある。従来の原子炉設計のため等の工学的な実用を目的とするだけでなく、基本的な原子核物理学での利用のためにも核データが存在する、という意義が認められつつあるといえよう。

こうした観点は NRDF 作成の目的に沿うものであり、Summary における High Lights (資料5) に次の文章をいれることにより、意見が反映された。

It was noted that the scope of the jointly maintained databases has widened to cover not only data of practical interest for applications, but also basic nuclear physics.

4. 核データセンターネットワークに対する補助要請について

昨年度の Annual Report での報告があるように、現在、核データセンター会議への参加は各国から1名のみが、正式参加とされており、IAEA からの旅費補助等の対象となる。しかし、上述の参加者リスト(資料2も参照)から見てわかるように、アメリカ、日本、ロシア等はいくつかの核データセンターを抱えており、またこれらのセンターは各々異なる役割を持っている。よって、これらの全ての核データセンターからの参加が必要とされ、これに対する補助が望まれる、という Statement (資料6) が了承された。

最後に、この会議に参加して感じたことを、2、3述べておく。一つは、各国とも財政状況が厳しくなっているため、核データ活動の意義と目的を見直す、あるいは拡張することが大きな課題になっていることである。このことには、現在の各国での原子力政策が必ずしも順調に進んでいないことも背景としてはあると思われる。このため、「普遍的な基礎定数の確定(原研核データセンター、長谷川氏)」という言葉に代表されるような学術的な目的を含めた広い視野が要求されるようになっているのである。また、テクニカルな面では、WWW に代表される internet の利用が今後大きな柱になっていくことをますます痛感した。我々のグループで現在進めている、Intelligent Pad による NRDF の利用・再利用・合成、WWW 上でのデータ公開、はこのような流れに沿ったものである。

Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

Status Report to
the IAEA Advisory Group Meeting
June 3-7, 1996

The Executive Committee of JCPRG

General

In the meeting of the NRDF advisory committee, which was held on 28 March, 1995, we had conclusions on our responsibilities in the international nuclear data centers' network;

- (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 EXFOR for the convenience of the customers in Japan,
- (4) Distributing CPND and Promoting utilization within Japan.

The JCPRG is organized by two committees and secretariat in order to accomplish above four duties. The members of both committees were reported at the NRDF consultants' meeting on the technical aspects in May 2-4, 1995, and we have no change.

NRDF Data Compiling Activity

We newly compiled 56 entries (1,328 tables) in 1994 and 41 entries (200 tables) in 1995, whose all data have been produced by the accelerators in Japan. By March of 1996, amount of the data compiled have reached 23,133 tables of about 66.4 MB. Our aim is to store all data produced by Japanese accelerators in the NRDF database. The amount of data to be compiled is approximately 1,000 tables and 3 MB in every year.

EXFOR Translation form NRDF

In 1994, TRANS E012 and E013 were made as update versions of TRANS E010 and E011, respectively. For the TRANS E012 and E013, We received from IAEA further useful comments pointing out some errors remained in the entries. In 1994, we made corrections according to the comments from IAEA and edited TRANS E014 which contained only the entries requested re-transmission in the two TRANS tapes. We also submitted TRANS E015. The TRANS E015 contained 6 new entries which were translated from the NRDF entries compiled in 1993. Translation of the NRDF data compiled in 1994 and 1995 has

been started from this April.

Customer Services

To disseminate the use of Charged-Particle Reaction Data in EXFOR Library to researchers in Japan, we are planning to install the index information retrieval service on the National Center for Science Information Systems (NACSIS). The same index information retrieval system has already been installed and opened to users of the Hokkaido University Computing Center, where the retrieval service of NRDF data are performed.

For the purpose to extend the NRDF data service to more general users, we are investigating feasibility to apply the IntelligentPad system to nuclear data. This study is expected to provide a new retrieval system working on a worksatation with object oriented graphical user interface.

Evaluated Data: Nucleosynthesis

New data evaluation activity for charged-particle data has been discussed to make nucleosynthesis database in Japan. Recently, the working group was organized.

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AGENDA

Plenary session

- P.1 Opening, election of chairman
- P.2 Adoption of the agenda
- P.3 Quick review of the highlights of
 - the last Technical NRDC meeting (INDC(NDS)-343) and
 - the last Advisory Group Meeting (INDC(NDS)-308)
- P.4 Brief status reports of the centres (reports requested in writing)
- P.5 Customer services
 - conventional services
 - electronic services
 - interactive online systems
 - FTP
 - WWW
- P.6 Evaluated data libraries
- P.7 Next NRDC meetings
 - Technical meeting 1997 in Vienna
 - AGM in 1998 in Vienna (or elsewhere?)

Centre heads session, neutron data centres

- N.1 general situation, manpower
- N.2 customers and role of the centers, future developments

Centre heads session, all data centres

- C.1 Report on the U.S. Nuclear Reaction Data Network (M. Bhat)
- C.2 Review of data needs and ongoing activities for applications
- C.3 CPND compilation responsibilities
- C.4 general situation, manpower
- C.5 who does what in the next 2 years
- C.6 update of the "Network Document" and of the Network summary in the NRDC Meeting Minutes (see the Actions in INDC(NDS)-343 p.11)

Technical session (all data types)

- T.1 Maintenance of EXFOR/CINDA dictionaries
 - Review of actions INDC(NDS)-308 App. 3 p. 1
- T.2 Data exchange between centres
 - Update of the list of preferred/acceptable media,
see INDC(NDS)-308 App. 5
- T.3 Brief EXFOR Guide: for publicity, for online users, for CPND compilers?
- T.4 Review of actions on EXFOR from last Technical NRDC meeting,
INDC(NDS)-308 App. 3
- T.5 Pending EXFOR matters (dictionary and manual updates, coding rules)
- T.6 The "date" field in the computer files beyond the year 2000
- T.7 TRANS tapes transmitted since last meeting
- T.8 Common graphics software
- T.9 Citation guidelines for computer files

Technical session (Photonuclear Data)

- TP.1 Review of actions
- TP.2 Data compilation and evaluation
- TP.3 Cooperations on photonuclear data

Technical session (CPND)

- TC.1 Review of actions
- TC.2 Compilation responsibilities and mechanisms to avoid duplications
- TC.3 Compilation and evaluation
- TC.4 Intermediate energy data in EXFOR

Technical session (Neutron data)

- TN.1 Sharing of address list information
- TN.2 Review of actions from last Technical NRDC meeting
- TN.3 CINDA
- TN.4 Neutron EXFOR compilation and completeness

Final plenary session

- FP1. Summary and conclusion of the Center heads sessions
- FP2. Summary and conclusions of the technical sessions
- FP3. Summary and conclusions of the plenary session
- FP4. Other business
- FP5. Closing of the meeting

(資料 4)

Agreement on Charged-Particle Data Compilation Responsibility

Compilation Centers

NNDC	NEADB
JCPRG	RIKEN
ЦАЯД	CNDC
ATOMKI	

Area of Responsibility

New Data (1989→)

NNDC will be responsible for data from the U.S. and Canada.

JCPRG will be responsible for data from Japan.

ATOMKI will be responsible for data from Hungary and Jülich.

ЦАЯД will be responsible for the rest of the world.

Old Data (→1988)

JCPRG will be responsible for data from Japan.

ЦАЯД will be responsible for all other data.

Data Compilation

New Data (1989→)

A center wishing to compile data (C1) will contact the center in whose area of responsibility the data were produced (C2) with a list of the data sets to be compiled. C2 will inform C1, as quickly as possible, whether the data either have been compiled or are in the process of being compiled by another center.

If the data are not compiled or being compiled, C2 will either agree to compile them with priority, or ask that C1 compile the data and send them to C2 to be included in the next regular C2 transmission file.

Old Data (→1988)

A center wishing to compile data (C1) will contact all other centers with a list of the data sets to be compiled. The center responsible for the data (Sapporo or ЦАЯД) will inform C1, as quickly as possible, whether the data either have been compiled or are in the process of being compiled by another center.

If the data are not compiled or being compiled, C1 will compile the data and include it in the next regular C1 transmission file.

SUMMARY

1. INTRODUCTION

The IAEA Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centers (NRDC) met in Brookhaven during the week 3-7 June 1996, hosted by the U.S. National Nuclear Data Center (NNDC). The meeting was opened by Dr. R. Bari, Head of the Department of Advanced Technology, Brookhaven National Laboratory, and by H.D. Lemmel (IAEA) as the Scientific Secretary on behalf of the IAEA. C.L. Dunford (NNDC) acted as the Chairman of the plenary sessions. O. Schwerer chaired the technical sessions. V. McLane (NNDC) was the local organizer.

The meeting was attended by 16 participants from 13 Data Centers from China, Hungary, Japan, Russia, Ukraine, USA, and the Centers of NEA and IAEA, plus part-time participants from the U.S. Department of Energy and staff of the NNDC.

The objectives of this Advisory Group Meeting, which was one in a series of biennial Data Centers Coordination Meetings, were to review the status of the cooperation of the NRDC Network for the previous two years, to plan for the forthcoming two years, and to update the nuclear data compilation rules for newly encountered data types.

The Network of eleven nuclear data centers as laid down in the report INDC (NDS)-324, welcomed the meeting attendance, for the first time, of staff of the data center of NIEF in Sarov (previously Arzamas-16), and of the Institute for Nuclear Research (INR) in Kiev, Ukraine.

The main elements of the Network cooperation cover:

- the work-sharing in the Data Center Services to customers worldwide;
- the compilation and exchange of experimental nuclear data, and the maintenance of the jointly operated systems: EXFOR and CINDA;
- the exchange of evaluated nuclear data libraries;
- the exchange and joint operation of related software.

2. HIGHLIGHTS

A topic of major importance that was discussed at this meeting was the challenge resulting from the rapid advances of electronic information technologies and the impact on the data dissemination methods by the centers, as discussed under item 3 further below. The centers will make major efforts to further expand their online services, specifically under the widely used World Wide Web technology. NNDC and IAEA/NDS confirmed a cooperation effort accompanied by staff exchange in 1996, with the possible inclusion of NEA-DB and CDFE late in 1996.

As the online information can be updated frequently, the archiving of databases and the correct and accurate referencing of data extracted from online services, present new problems which were discussed at the meeting. Citation guidelines will have to be established and publicized in the online systems together with the data files. The meeting discussed and expressed concern about the further distribution of the Network's data by individuals and organizations outside the Network.

While the development of electronic data center services is essential, it is as essential to devote sufficient efforts on the maintenance and updating of the nuclear databases. Significant progress was reported on the completeness and up-to-datedness of the experimental neutron data files EXFOR, which is basic to all neutron data evaluation work.

In addition to electronic services, handbooks covering the most commonly used data types and nuclear data related textbooks continue to be required. With respect to the CINDA handbook, NDS and NEADB will survey the present needs for a continuing hard-copy publication of CINDA. Attention must be given to the archival function of printed materials such as Nuclear Data Sheets.

The meeting welcomed plans of NNDC to develop a "Super CINDA" file which would incorporate the traditional neutron-data CINDA file, the photonuclear bibliography by CDFE and JAERI, and also a new bibliographic file for charged-particle reaction data including intermediate energy data.

The technical sessions discussed, among other items, the updating of the compilation rules, including updated EXFOR rules covering specific needs for intermediate energy nuclear data. A large list of conclusions and actions resulted from the meeting. The information exchange and data file exchange between the centers were reviewed according to the changing developments of available electronic media.

It was noted that the scope of the jointly maintained databases has widened to cover not only data of practical interest for applications, but also basic nuclear physics.

The meeting reviewed the objectives and requirements for the future Data Center Network Coordination Meetings and requests the IAEA to continue the required funding of these meetings as outlined in the "Statement" given further below.

3. ELECTRONIC SERVICES

The Nuclear Reaction Data Centers Meeting discussed the future directions in providing customer services. It is clear that in several centers (i.e. US, NEA, Japan) traditional request services are declining in volume and are being replaced by electronic access to the data produced by the network. The meeting noted the special requirements of those data centers servicing customers in countries where electronic networking is primitive or nonexistent. In such cases, traditional services via paper and magnetic media will continue in addition to the fast increasing online services. Requests for services from the IAEA/NDS by developing

countries are expected to continue at the present level. Therefore it is expected that NDS will have to maintain the present capability to handle information requests in the traditional manner. The centers also recognize the potential need for information distribution via CD-ROM.

The meeting concluded that the Network as a whole has the goal of developing a common customer interface using the widely available and rapidly developing World Wide Web technology. A common basis for reporting access statistics from the WWW is important to be developed. The initial steps in this collaboration will be undertaken in June 1996 by NNDC and IAEA/NDS to be followed by a visit by NNDC staff to Vienna in September. At that working meeting, the NEADB and CDFE are expected to participate. Further input for this project is expected from the joint US Nuclear Data Network's workshop on Nuclear Data and the Internet scheduled for August 1996.

The meeting discussed the need to provide access to information about meetings of interest about Nuclear Data. NNDC maintains on their WEB site, a page of pointers to information about meetings of interest. This item should be addressed during the joint WWW development project.

The meeting expressed concern about the widespread "repackaging" of data originally produced by the network. While recognizing that not much can be done to control this problem, the network expressed its desire that such products accurately reflect the data taken from network sources and that those sources receive proper credit and reference as to version and date of the data base from which the information was extracted.

4. ACHIEVEMENTS SINCE THE LAST MEETING

Since the Paris Meeting in 1994, a new cooperation has been established on photonuclear data, between the CDFE, Moscow, JAERI, and CJD Obninsk, covering a bibliographic file, an EXFOR file with experimental data, and a new evaluated data file.

The cooperation on charged particle nuclear data continued with contributions from Arzamas-16, ATOMKI, CAJaD, CNDC, JCPRG, NEA-DB, NNDC, and RIKEN. Topics of priority were data for medical applications and intermediate energy nuclear data. The agreement on charged-particle data compilation responsibilities was updated.

The four neutron reaction data centers made significant efforts to improve the completeness of the basic neutron data files EXFOR and CINDA.

Important data libraries that have been exchanged during the period since the last meeting include:

- ENDF/B-VI updates and ENDF utility codes by NNDC;
- a large CENDL update by CNDC;
- JENDL-3 updates by JAERI;

- the finalization and release of FENDL by IAEA-NDS;
- the release of EFF by the Data Bank;
- the neutron activation library ADL-3 and the intermediate-energy data library MENDL-2 by CJD;
- a charged-particle data EXFOR compilation by CAJaD and the NEA Data Bank;
- and, last but not least, EXFOR and CINDA transmissions by all centers.

The Minutes of the Meeting, including a long list of Conclusions and Actions, will be included in an INDC(NDS)-report.

Attachments

- **Statement, on the future of the Data Center Coordination Meetings**
- **Appendix**
- **List of Participants**
- **Agenda**
- **Actions and Conclusions**

Statement

The meeting took note of the difficulties under the present IAEA rules regarding the conduct of Agency-sponsored meetings, to continue to support the Nuclear Data Center Coordination Meetings in their traditional form. In contrast to other meetings, these Coordination Meetings require the participation of more than one participant per country and, in a few cases, of more than one paid participant from a single country.

The Nuclear Data Centres Networks (as documented in the report INDC(NDS)-324 and the Nuclear Data Newsletter No. 20) include cases with two or three specialized centers in the same country. These centers have, within the Network, specialized functions by which they service the various requirements of the user community worldwide. As all of these centers must be represented at the Network Coordination Meetings, it is vital, under the present economic conditions that, in certain cases, the IAEA provide funding for the meeting attendance of two or three centers from the same country.

For the meetings outside Vienna it is essential that the Nuclear Data Section can continue to be represented by its Section Head and the technical expert of the Section.

The IAEA is requested to continue to provide the umbrella for the Nuclear Data Centers Network including the required funding of meetings as outlined above and, as necessary, to provide exceptions to the usual IAEA meeting rules.

The International Nuclear Data Committee and its Chairman are asked to support this Statement. For further details see the following Appendix.