NEA Data Bank Report to the NRDC, Vienna, 28-30 May 2001

Introduction

The Data Bank continues to have its full staff level of two professionals working on Nuclear Data topics, namely Dr Mark Kellett and Dr Ali Nouri.

Experimental (EXFOR) and Bibliographic (CINDA) data compilation

A total of 70 EXFOR entries for neutron induced experiments, were compiled and transmitted to the other data centres in since the last meeting in May 2000. Forty six (46) of these entries concerned new experiments.

More than 600 new entries were compiled into the CINDA database in the same period.

The updated CD-ROM version of the CINDA database has once again been distributed. Little feedback has been received during 2000 following the original distribution, probably due to the extensive testing that was carried out prior to its distribution.

Intermediate Energy Nuclear Data (IEND) for EXFOR

In 2000 the Data Bank compiled ~100 new data sets from charged particle induced experiments and these are currently undergoing testing before being entered into the EXFOR database. Due to additions to the database structure, a complete re-writing of the loading/retrieval programs (conversion from FORTRAN coding to PERL scripts) and hardware upgrades the loading has been delayed somewhat. Currently there are approximately six (6) tapes awaiting loading. The first five (5) of these have undergone the preliminary testing stage in the FTP site at Vienna and will be finally loaded and distributed during June 2001.

The Joint Evaluated Fission and Fusion Project (JEFF)

Two versions of the JEFF-3.T general-purpose starter file were produced in 2000, following improvements to the evaluations through the correction of format and physics errors. New evaluations are incorporated as they become available (e.g. EFF files) or when changes to the initial recommendations (e.g. for Fission Products and Minor Actinides) are decided based on additional evidence. The validation of the file is ongoing in the form of calculations of a subset of the JEF-2.2 benchmarks. Special emphasis is being put on PWR uranium lattices, since earlier results showed a slight systematic underestimation of the reactivity of these lattices.

For the production of the Radioactive Decay Data starter file, comparisons were made between the two libraries recently produced in the UK, UKPADD-6.1 and UKHEDD-2.2, and further evaluations based on NUBASE and ENSDF data. The first version of the JEFF-3.T Decay Data file, containing ~3700 nuclides, was produced in late 2000 and extensive testing was applied including the development of specific methods for energy balance checks. These have been implemented into the FIZCON code, renamed EFIZCON, and the changes have been sent to Charlie Dunford for consideration for inclusion into the official version of the code. The feedback received from this first step is being implemented in the production of a second version of the starter file expected for June 2001. The Fission Yields starter file, consistent with this JEFF-3 Decay Data starter file, still has to be produced based on the UKFY3 evaluations,

normally produced by Robert Mills of BNFL in the UK. It is hoped that this work will be completed by the end of 2001.

The production of the JEFF-3 Intermediate Energy files, by extending the evaluations up to 150 MeV, will take place based on calculations with the TALYS nuclear reaction model code, being developed by Arjan Koning of NRG Petten and colleagues at Bruyeres-le-Chatel in France, as soon as this new code becomes fully operational later in 2001.

The target date for the official release of the first version of the JEFF-3 library is 2002. Current efforts aim at assuring that this library will be of high quality, internally consistent and as free of errors as possible. Following this initial release, the various parts of the file will be completed and improved in subsequent versions. As with past JEF and EFF libraries, improvements of the JEFF-3.0 library will be guided by users' needs and feedback, as well as by the results of the benchmarking studies.

The latest JEFF meeting was held in Aix-en-Provence on 15-18 May 2001. Other workshops were also held in conjunction with this JEFF meeting, including the NJOY users' group and a workshop on the measurement needs of the JEFF project, which incorporated possible contributions from the experimental community. This second meeting was attended by participants from numerous European facilities and following from its success a new sub-group of the JEFF project will meet regularly to discuss experimental measurements and their needs.

Apart from the JEFF files themselves, an extensive effort in year 2000 was devoted to the area of documentation. After the publication of two inter-comparison exercise reports (JEFF reports 15 and 16), the official JEF-2.2 documentation, containing all the results from the benchmark testing of the file, was issued in 2000 as JEFF Report 17. Finally, a reference document on resonance data evaluation, describing the underlying physics, mathematical and statistical background, was published, in cooperation with CEA Cadarache and EdF, as JEFF Report 18. This report was complemented by the organisation, for the second time in two years, of a full week training course on the resonance analysis code SAMMY. All the JEFF reports are available free of charge from the NEA Data Bank or can be downloaded online from our web pages.

Almost all new JEF and EFF documents are received in electronic form prior to the meetings and are made available via the associated web pages. The documents can thus be searched by keywords without the need for scanning and Optical Character Recognition processing. Participants to the meetings are also encouraged to make their presentations directly from a PC as this allows a much better quality to be achieved. Access to these documents is generally restricted to project members as they can contain data and results which may be preliminary in nature. Access can be granted to non-members on an individual basis upon request.

High Priority Request List

The NEA Data Bank has taken an initiative on behalf of the WPEC sub-group concerned with the High Priority Request List. This involves loading the List into an ORACLE database so that online searches can be performed, but more importantly specific users can add comments to the list concerning the quoted requests. This should allow the document to become more accessible and much more "alive". All users will be able to work on the same List at the same time and hence updating and management becomes much more efficient.

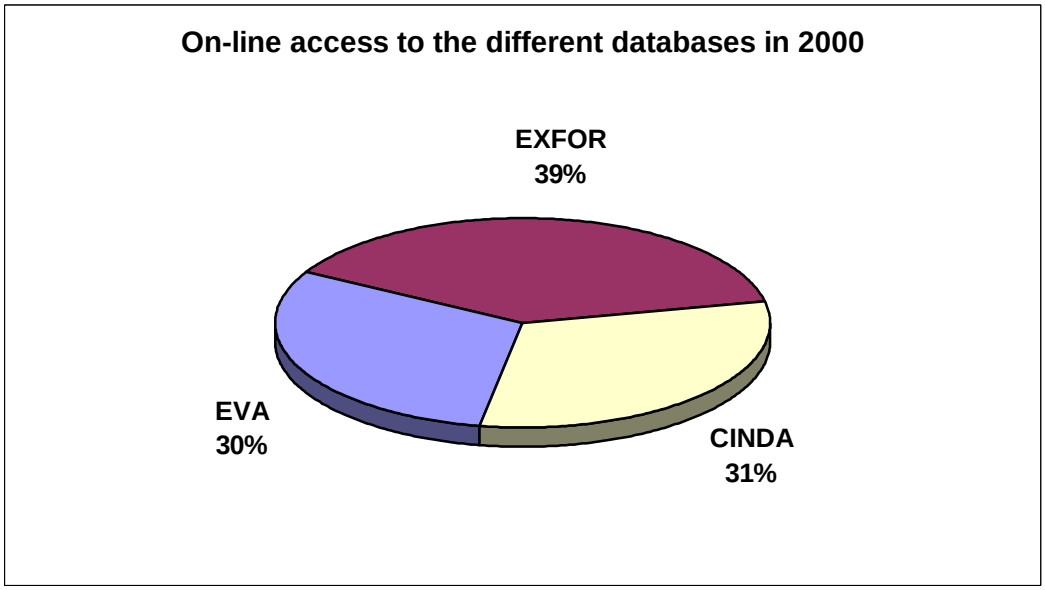
JANIS Software and documentation

JANIS (the Java Nuclear Information System) is a computer program to display different types of nuclear data (experimental, evaluated and processed data). JANIS inherits the features of JEF-PC, while incorporating a number of improvements such as the capability to display resonance parameters, energy and angular distributions, etc.. JANIS was written in JAVA for maximum portability. Beta versions were distributed by the NEA Data Bank to more than sixty users for testing purposes (see http://www.nea.fr/html/dbdata/janis/). This testing has provided interesting feedback, thus enabling the Data Bank to improve the capabilities of the software. The official version will be released in conjunction with the next Nuclear Data Conference to be held in Japan in October 2001.

Services to Nuclear Data Users

The Data Bank answered one hundred and eighty (180) manual data requests in 2000. Most of these were either for copies of the CD-ROM of the JENDL-3.2 general-purpose file (90 copies) or of the JENDL/D-99 dosimetry file (70 copies), made available to the Data Bank by the JAERI Nuclear Data Centre. Other than the distribution of these two CD-ROMs, the number of manual requests continues to decrease as the online service improves and more users become registered for direct data downloads. Most of the requests now coming to the Data Bank do not require data to be directly distributed, but instead relate to giving advice on the use of the data that is available via our online services.

The number of registered on-line accesses in 2000 was slightly more than twenty thousand (20,000). More than 8 Gigabytes of data were retrieved directly on-line. Close to two thousand (2,000) scientists have registered and obtained passwords for access to the databases containing nuclear data. The following figure shows the division of these accesses between our various databases, EVA being the evaluated data database, generally for the main international libraries in the ENDF-6 format.



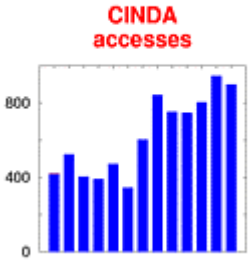
It is planned to improve the nuclear data customer services by providing an on-line graphical display possibility. The on-line graphical display for EXFOR data is in place and allows users to produce high quality output for publication purposes, or to use a JAVA based tool which allows easy online manipulation and zooming. The planned extension to include also evaluated cross section data plotting directly on the Data Bank's Web page or from a distributed CD-ROM is under way and is expected to be available for testing in early summer 2001. This work is being closely co-ordinated with the JANIS development.

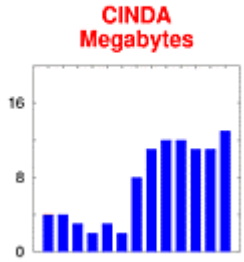
The following figures show the online statistics for the various databases for the preceding 13 months, i.e. April 2000 – April 2001.

Nuclear Data Services Web Statistics April 2000 – April 2001

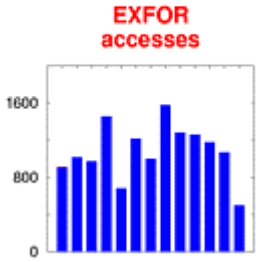
All figures show the last 13 months of activity

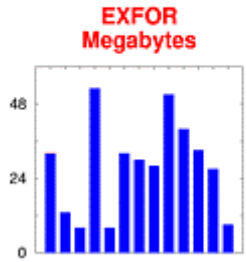
CINDA Bibliographic database





EXFOR Experimental database





Evaluated Data database **JEFF/EFF Project Documents**