Data Bank

The Data Bank operates as an international centre of reference for its member countries respect to basic nuclear tools, such as computer codes and nuclear data, used for the analysis and prediction of phenomena in the nuclear field. It provides a direct service to its users by developing, improving and validating these tools and making them available as requested.

The Data Bank computer program and nuclear data services celebrated its 40th anniversary in 2004. During these 40 years, 67 000 copies of computer program packages were distributed to some 600 establishments, and scientists in member countries have enjoyed free access to a very large collection of bibliographic, experimental and evaluated nuclear data.

Computer program services

During 2004, 1 846 computer program packages were distributed upon request. The major topics of interest in 2004 were programs and associated data libraries for radiation transport and reactor physics. About 20% of the dispatches of computer programs and integral data sets were sent upon request to non-OECD establishments, in accordance with a co-operative agreement with the International Atomic Energy Agency (IAEA).

In addition to the computer program services, the Data Bank is also involved in the development of a graphical user interface that will guide the user to solve radiation transport problems, and in the development of tools for the analysis and estimation of sensitivities and uncertainties in calculations, or their propagation through complex computational schemes, used for example in the field of neutronics and thermal-hydraulics.

Two editions of nuclear program abstracts on CD-ROM were issued in May and September 2004, and five electronic newsletters were sent out to liaison officers and subscribers during the year. Users of the computer program services have provided feedback on their use of the codes and this information has been transmitted to the computer program developers.

Computer program training courses

The Data Bank organised three tutorial courses in conjunction with the International Conference on Radiation Shielding in May 2004. The subjects covered were:

- Big Challenges in Monte Carlo: from Physics to Biology,
- An Introductory Course in Proton Cancer Therapy,
- Radiation Shielding for Diagnostic Radiology and Radiation Therapy.

In addition, the Data Bank arranged a training course on PENELOPE-2003 (an electron-photon transport code) in Barcelona, Spain in October 2004.

Preservation of information from integral experiments

Under the scientific guidance of the NEA Nuclear Science Committee, the Data Bank collects and distributes well-documented information and data from integral experiments in the areas of reactor physics, radiation shielding, fuel behaviour and thermal-hydraulics. Major emphasis was devoted to establishing electronic archives of data and reports from high-temperature reactor experimental campaigns. During 2004, the Data Bank distributed 3 472 sets of integral data, the most popular being the fuel behaviour database (60% of the total distribution), followed by an almost even popularity among the three other categories.

Nuclear data services

The compilation, exchange and dissemination of bibliographic, experimental and evaluated nuclear data are performed within an international framework comprising a small number of nuclear data centres of which the Data Bank is a major one. In 2004, the Data Bank contributed data from about 200 new experiments to the international EXFOR database containing measured data. The nuclear data services are to a very large extent provided through direct online access to the different databases. The Data Bank registered close to 30 000 accesses to these databases in 2004.

A new version of the JANIS nuclear data display program (JANIS-2.1), designed to facilitate the visualisation and manipulation of nuclear data, was released in August 2004. The latest version includes the possibility to access centralised stored data (available on the NEA server) through Java servlet technology. The program is distributed only on DVD to permit inclusion of

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- A new version of the JANIS nuclear data display programme (JANIS-2.1) was released in August 2004.
- A preliminary, new version of the Joint Evaluated Fission and Fusion (JEFF) data file underwent extensive testing in 2004, with the goal of releasing the file in mid-2005.

all of the main databases on one single medium for local access. The software can also be downloaded directly from the NEA website. See www.nea.fr/janis/ for further information.

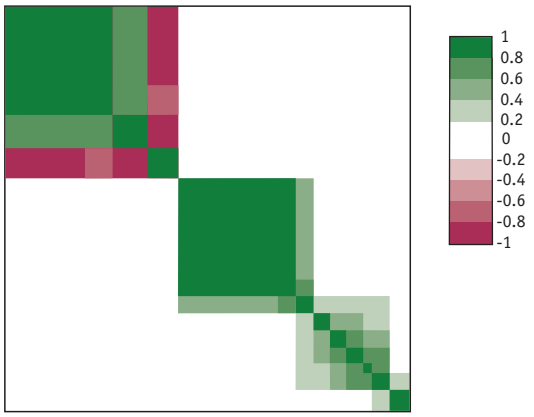
The JEFF project

The third version of the Joint Evaluated Fission and Fusion (JEFF-3.0) nuclear data library was released in 2002 and has since undergone extensive processing and validation, highlighting files that are in need of revisions. In parallel, evaluation work is progressing with the aim of providing new or revised evaluations for inclusion in the next release of the library (JEFF-3.1). A preliminary version of JEFF-3.1 was issued within the JEFF community in November 2004. It is planned to release the final JEFF-3.1 library to the public in mid-2005. This library will include general purpose data as well as special purpose files on activation, radioactive decay and fission yield data.

International nuclear data evaluation co-operation

Activities in the area of nuclear data evaluation co-operation promote the exchange of information on nuclear data evaluations, associated measurements, nuclear model calculations and related topics, and provide a framework for co-operative activities between the participating nuclear data evaluation projects. Two reports, entitled *Activation Cross-sections and Assessment of Neutron Cross-sections for the Bulk of Fission Products*, are being prepared for publication in early 2005. Issues to be discussed in the near future comprise improvements to minor actinide data, evaluation and processing of uncertainty (covariance) data, and a review of photon production data. Work to establish a better-structured high priority request list for nuclear data continues, and a new test database was created in 2004.

Fission cross-section uncertainty correlations as a function of energy for 241PU



The Thermochemical Database (TDB) Project

The Data Bank is developing a database of recommended chemical thermodynamic data for the safety assessment of radio-active waste repositories. This work is performed under the scientific guidance of the NEA Radioactive Waste Management Committee. The details of this programme can be found in the section "Joint Projects and Other Co-operative Projects" (page 35).

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