

International Reactor Physics Experiment Evaluation (IRPhE) Project

The International Reactor Physics Experiment Evaluation (IRPhE) Project aims to provide the nuclear community with qualified benchmark data sets by collecting reactor physics experimental data from nuclear facilities, worldwide. More specifically the objectives of the expert group are as follows:

- maintaining an inventory of the experiments that have been carried out and documented;
- archiving the primary documents and data released in computer-readable form;
- promoting the use of the format and methods developed and seek to have them adopted as a standard.

For those experiments where interest and priority is expressed by member countries or working parties and executive groups within the NEA provide guidance or co-ordination in:

- compiling experiments into a standard international agreed format;
- verifying the data, to the extent possible, by reviewing original and subsequently revised documentation, and by consulting with the experimenters or individuals who are familiar with the experimenters or the experimental facility;
- analysing and interpreting the experiments with current state-of-the-art methods;
- publishing electronically the benchmark evaluations.

The expert group will:

- identify gaps in data and provide guidance on priorities for future experiments;
- involve the young generation (Masters and PhD students and young researchers) to find an effective way of transferring know-how in experimental techniques and analysis methods;
- provide a tool for improved exploitation of completed experiments for Generation IV reactors;
- co-ordinate closely its work with other NSC experimental work groups in particular the International Criticality Safety Benchmark Evaluation Project (ICSBEP), the Shielding Integral Benchmark Experiment Data Base (SINBAD) and others, e.g. knowledge preservation in fast reactors of the IAEA, the ANS Joint Benchmark Activities;
- keep a close link with the working parties on scientific issues of reactor systems ([WPRS](#)), the expert group on reactor-based plutonium disposition (TFRPD), now integrated into WPRS, scientific issues of the fuel cycle ([WPFC](#)) and the working party on international evaluation co-operation ([WPEC](#)).

The Secretariat of the group is provided by the OECD/NEA Data Bank, who is in charge of the management of the material released to the project. The Technical Review is chaired and co-ordinated by J.B. Briggs from INL, USA.

Current activities

The group is currently:

- maintaining an international inventory of relevant reactor physics experiments and measurements, preserving in computer readable form the primary documentation and data describing the facilities, characterising the experimental techniques, the experimental results and interpretation thereof;
- developing and maintaining an international database containing a sub-set of high priority reactor physics benchmark specifications derived from the experiments performed at various nuclear facilities around the world, relevant for or including data from power reactors (e.g. Advanced Gas Reactors, Fast Reactors, Generation-IV Reactors, Water Reactors, etc.)

The following type of measurements are included:

- fundamental mode lattice experiments;
- heterogeneous core configurations;
- power reactor start-up data;
- core follow experiments;
- specific applications experiments (e.g. fission product integral data, irradiation experiments).

The benchmark specifications and experimental data are intended for use by nuclear reactor physicists and engineers to validate current and new calculational schemes including computer codes and nuclear data libraries, for assessing uncertainties, confidence bounds and safety margins, and to record measurement methods and techniques.

Eighth edition and availability

The eighth edition of the International Handbook of Evaluated Reactor Physics Benchmark Experiments was published in May 2013 (ISBN 978-92-64-99208-5) and contains reactor physics benchmark specifications that have been derived from experiments that were performed at various nuclear experimental facilities around the world. The benchmark specifications are intended for use by reactor physics personnel to validate calculational techniques. This Edition contains data from 131* different experimental series that were performed at 47 different reactor facilities. The total number of experimental series includes 65 ISCBEP benchmarks of reactor configurations, which were shared with the 2013 IRPhE handbook. 127 of the 131* evaluations are published as approved benchmarks. The remaining 4 evaluations are published as DRAFT documents only. Draft documents have been reviewed by the IRPhEP Technical Review Group (TRG); however, all action items could not be completed or reviewed in time for the final publication or, in most cases, the TRG felt it necessary to review the revised evaluations before giving final approval. The Handbook is organized in a manner that allows easy inclusion of additional evaluations, as they become available.

*this number differs from what is written in the back cover (130). 1 experiment was added between the printing of the cover and the publishing of the Handbook, increasing the final number of different experimental series for the 2013 version to 131.

The Handbook is published in electronic format (pdf files), where the experiments are grouped into evaluations, categorised by (1) Reactor Name, (2) Reactor Type, (3) Facility Type, and (4) Measurement Type.

The Handbook was prepared by a working party comprised of experienced reactor physics personnel from Belgium, Brazil, Canada, P.R. of China, France, Germany, Hungary, Japan, Republic of Korea, Russian Federation, Slovenia, Switzerland, United Kingdom, and the United States.

The IRPhEP Handbook, featuring the [IRPhEP Database and Analysis Tool \(IDAT\)](#), is distributed on DVD and online. It can be requested by completing the [request form](#).

The IRPhEP Handbook is available to authorised requesters from the OECD member countries and to contributing establishments from non-OECD countries. Other requests are handled on a case by case basis. Find out more about the [restrictions](#), [the disclaimer](#), and [providing feedback](#)

Co-operation

- IRPhE co-operates and co-ordinates its work with the [ICSBEP](#): International Criticality Safety Benchmark Evaluation Project.

Acknowledgments

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