RSIC Newsletter

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312 *November 1990*

In the advance of civilization, it is new knowledge which paves the way, and the pavement is eternal.)W. R. Whitney

CHANGES TO THE COMPUTER CODE COLLECTION

Eight changes or additions were made to the computer code collection during the month. Four new code systems were packaged and added to the collection, an existing code package was extended with an additional hardware version, an existing code package was replaced with a newer version, and two existing code packages were updated or corrected. Three changes resulted from foreign contributions.

CCC-200D/MCNP 3

A new personal computer version of this general purpose Monte Carlo neutron and gamma-ray transport code system was provided by Experimental and Mathematical Physics Consultants (EPMC), Gaithersburg, Maryland. This version, designated CCC-200D/MCNP 3, is based on the CCC-200C package contributed by EPMC. This new release was implemented on a DTK 80386 PC with an 80387 coprocessor both 20 MHz, an 8 Mbyte memory (4 Mbyte used as virtual disk), and a 128 Mbyte hard disk in four partitions (C through F). It runs under MS DOS 3.3. The Lahey FORTRAN Compiler F77L-EM/32, Version 3.00 was used. Note that MCNP 3B has been released by the Los Alamos developers and distributed by RSIC for mainframe users since February 1989. The PC version is distributed on 9 DS/HD (1.2 MB) 5.25-in. diskettes. References: LA-7396-M, Rev. (April 1981) and informal documentation. FORTRAN 77; CDC 7600, CRAY 1, IBM 3033, VAX 11 (A), IBM PC/AT (B) and PC 386 (C and D).

CCC-459/BOLD VENTURE IV

This microcomputer version of the BOLD VENTURE IV package for reactor analysis, a subset of the IBM mainframe version, was updated to version 2. The programs were modified at the University of Cincinnati in Ohio and funded by the Department of Energy via the Idaho National Engineering Laboratory. Included are the control module, input processors, a cross-section processor, the VENTURE neutronics code, and an exposure module which utilizes the BURNER code for depletion calculations. VENTURE solves neutronics eigenvalue, adjoint, fixed source, and criticality search problems using diffusion theory. It treats up to three dimensions, maps power density, and does first order perturbation analysis at the macroscopic cross section level. BURNER solves the nuclide chain equations to estimate the nuclide concentrations at the end of an exposure time, and

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also after a shutdown period. This is version 2 of the microcomputer code. In this version, the special processor DENMAN was added; VIP was updated; flux iterations are done in core and other enhancements were added. Five DS/HD (1.2MB) diskettes are required for transmittal. The compiler used is Lahey FORTRAN, version 2.22; the linker is Phoenix PLINK86 Plus overlay, version 2.24. Reference: EGG-2582, January 1990, EG&G Idaho. FORTRAN 66; IBM 3033 (A) and FORTRAN 66 and 77; IBM PC (B).

CCC-545/SCALE-4

An update to the Hansen Roach AMPX working library is now available. This library contains the corrected mixtures for: 200, 300, 301, 302 and 701. Note that the Hansen Roach AMPX working library is included in SCALE solely for the purpose of running the sample cases. It is not recommended for general use with the SCALE system. Because working format libraries have problem-specific temperature dependence and appropriate resonance processing, they must be tailored to individual problems. The corrected file is available on one DS/HD 5.25-in. diskette. The full package is available on one 6250-bpi tape or four 1600-bpi tapes. References: NUREG/CR-200, ORNL/NUREG/CSD-2/R4 Volumes 1, 2, and 3 (Draft January 1990). FORTRAN 77 and Assembler; IBM and CRAY.

CCC-550/TPTRIA

Kernforschungszentrum, Karslruhe, Germany, contributed this code system, TPTRIA, a FORTRAN 77 program designed to compute reactivity, effective delayed neutron fractions and mean generation time for two-dimensional triangular geometry on the basis of neutron transport perturbation theory. This package includes the FORTRAN 77 source of the two-dimensional discrete ordinates code DIAMANT2 (also CCC-414) which is necessary in order to compute direct and adjoint angular flux for input to TPTRIA. The code was run on a Siemens 7890 in Germany and on an IBM 3083 at the OECD Nuclear Energy Agency Data Bank, France. The operating system is MVS for the IBM computer. The VS Fortran compiler is used under MVS. Reference: KFK 4116 (October 1986). FORTRAN 77; IBM mainframes.

CCC-557/ZYLIND-PC

Wissenschaftlich-Technische Ingenieurberatung GmbH of Germany contributed this point kernel code for dose buildup. ZYLIND calculates gamma-ray penetration for source/shield configurations with cylindrical symmetry. Dose rates are calculated for axial or radial detector positions behind layered shields of user-specified composition. Dose buildup from subsequent layers is computed through Broder's recursive formula, with parameters interpolated from Goldstein's data. The three dimensional point kernel volume integral for a cylindrical homogeneous source is calculated by Gauss integration. The code was compiled and linked with Microsoft FORTRAN Version 4.01 using the math emulator library. One DS/DD (360kb) 5.25-in. diskette is required for transmittal. Reference: ZYLIND: User's Manual, WTI, Germany. FORTRAN 77; IBM PC and VAX family under VMS operating system.

PSR-237/EZVIDEO-PC

EZVIDEO replaces the EZPLOT code with the same PSR designation. EZVIDEO is a set of IBM PC-based FORTRAN 77 plotting routines contributed by Oak Ridge National Laboratory. EZVIDEO simulates a subset of the DISSPLA graphics calls; only two-dimensional plots can be produced. EZVIDEO either plots directly to a screen or to a matrix or laser printer. Currently EZVIDEO supports the LaserJet printer and most dot matrix printers. More than 40 DISSPLA calls are simulated. EZVIDEO supports CGA, EGA and VGA modes. The code is written in FORTRAN 77 and the executable program was tested under PC-DOS. For compilation and linking, Microsoft FORTRAN Version 3.31 or higher is needed. The package is distributed on 1 DS/DD (360kb) 5.25-in. diskette. There is no need for users who have already received EZPLOT to replace it. References: ORNL/CSD/TM-265 (June 1989). FORTRAN 77; IBM PC.

PSR-285/BASACF-PC

The Institute of Radiation Dosimetry of Prague, Czechoslovakia, contributed this code system to adjust the neutron spectrum based on integral detector measurements and calculation of an integral dosimetric quantity and its variance. BASACF

consists of two independent programs. BASADAT calculates the L-D factors of the covariance matrices. BASAUNF adjusts the spectrum by means of a covariance filter. The program executes on IBM PC and compatible computers with or without a math co-processor. The code is written in FORTRAN 77 and was tested under PC-DOS using the Microsoft Version 4.01 compiler and linker. The package is distributed on one DS/HD (1.2mb) 5.25-in. diskette. References: Report UDZ 254/88. FORTRAN 77; IBM PC.

PSR-286/COMBINE-PC

Idaho National Engineering Laboratory contributed this code system which computes the neutron spectra and ENDF/B-V based neutron multigroup constants suitable for use in diffusion and neutronics calculations. The energy range is broken into 166 discrete points for the spectrum calculation. The resulting matrix of flux values is solved using standard numerical techniques. Resolved resonance shielding of the fine mesh cross section data is performed using a table look-up technique or the Nordheim method. The unresolved range is treated using a statistical averaging technique. The program executes on IBM PC and compatible computers with or without a math coprocessor. The code will also run on most mainframes. The code is written in FORTRAN 77 and the executable program was tested under PC-DOS. For compilation and linking, the Lahey F77L compiler is necessary together with the PLINK86 overlay linker for the PC version. A standard FORTRAN 77 compiler is suitable for the mainframe version. The package is distributed on 7 DS/HD (1.2mb) 5.25-in. diskettes. References: EGG-2589 (April 1990). FORTRAN 77; IBM PC and most mainframes.

PUBLISHED STANDARDS

The following newly published standards are available from ASTM, 1916 Race St., Philadelphia, PA 19103-1187 (phone 215-299-5585), for the amount indicated.

E 821-89, *Practice for Measurement of Mechanical Properties During Charged-Particle Irradiation*, (revision of E 821-1981), $8.

E 942-89, *Guide for Simulation of Helium Effects in Irradiated Metals*, (revision of E 942-1983), $8.

The following standard is available from ANS, 555 N. Kensington Ave., La Grange Park, IL 60525, for $18.

ANSI/ANS-6.1.2-1989, *Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants*, (revision of ANSI/ANS-6.1.2-1983).

PERSONAL ITEMS

In serving a specialized area of scientific endeavor, it seems important that we note significant changes in the activities of people concerned with radiation protection, transport, and shielding in the nuclear industry. We, therefore, continue to carry personal items as they are brought to our attention.

Pavel Alekseevich „herenkov (1904–1990) died January 6, 1990, in Moscow, according to colleagues Boris B. Govorkov and Pavel S. Baranov of Lebedev Physical Institute. The information was passed on to RSIC by John Hubbell of the National Institute of Standards and Technology.

During his postgraduate career at the Physics Institute of the USSR Academy of Sciences in Moscow, „herenkov investigated the luminescence of solutions of uranium salts under the action of gamma radiation. He noted that the gamma radiation creates a weak luminescence of the solution, sharply different from normal luminescence. His further observation and experimentation defined the Cherenkov (or Cherenkov-Vavilov) effect, what we now know as Cherenkov radiation. He shared the Nobel Prize in Physics with I. E. Tamm and I. M. Frank ``for the discovery and explanation of the Cherenkov effect.'' Cherenkov's numerous awards and honors include the Order of Lenin (twice) and the State Prize of the Soviet Union (three times).

Dan G. Cacuci received Germany's Alexander von Humboldt Research Award, in the amount of 95,000 DM, in recognition of achievements in research. Cacuci conducted research at Kernforschungszentrum Karlsruhe

at the invitation of Gunther Kessler, director of the Inst. for Neutron Physics and Reactor Technique. The Humboldt Award is intended to promote long-term cooperation between German research institutions and the recipient's own institution in his own country. Cacuci returned to teach for the fall quarter at the University of California at Santa Barbara. Afterwards he will continue as professor of nuclear engineering at the University of Illinois, Urbana-Champaign. The editorial office of the ANS research journal, *Nuclear Science and Engineering*, will move to the University of Illinois with Cacuci, the editor, at the end of the calendar year.

Visitors to RSIC

During the month the following persons came for an orientation visit and/or to use RSIC facilities: *Charles A. Sparrow*, Mississippi State University; *Jack Courtney*, Louisiana State University, Baton Rouge, Louisiana; *HUANG Jinhua*, Southwestern Inst. of Physics, Chengdu, P.R. China; *Yu-Kun Ho*, Fudan University, Shanghai; and *Richard K. (Kep) Disney*, Westinghouse Electric Co., Madison, Pennsylvania.

CONFERENCES, COURSES, SYMPOSIA

RSIC attempts to keep its users/contributors advised of conferences, courses, and symposia in the field of radiation protection, transport, and shielding through this section of the newsletter. Should you be involved in the planning/organization of such events, feel free to send your announcements and calls for papers to RSIC.

ATR Workshop This Month

The ATR (Air Transport of Radiation) code is the Defense Nuclear Agency (DNA) standard for obtaining detailed initial radiation environments. Version 6 of ATR will be released this fall. The new version provides time dependent dose rates, delayed neutron environments, corrections for high altitude transport, and corrections for moisture in air and ground. The ATR Version 6 released for the PC operates under Microsoft Windows 3.0. DNA is sponsoring a 2½-day workshop on ATR Version 6 in the Washington, D.C. area on November 27!29. Those interested in attending should call, fax, or write the conference organizer William Woolson, Science Applications International Corp., 10260 Campus Point Drive, MS 33, San Diego, CA 19121 (phone 619-546-6224, fax 619-546-6116).

ICNC '91

The International Conference on Nuclear Criticality Safety (ICNC '91), will be held at Christ Church, Oxford, U.K., September 9!13, 1991. The Conference is the third international conference on nuclear criticality since 1983; earlier conferences were held in Dijon (1983) and Tokyo (1987). The conference is being organized jointly by AEA Thermal Reactor Services of AEA Technology and the OECD Nuclear Energy Agency with the co-operation of the International Atomic Energy Agency. It is co-sponsored by the British Nuclear Energy Society. The scope of the conference is sufficiently broad to cover all the major aspects of nuclear criticality safety.

Those who wish to participate should submit their abstracts on the following topics:

- Criticality Safety Experiments and National Programmes
- New Developments in Computational Methods and Data
- Criticality Safety Guides, Handbooks and Databases
- Validation of Codes and Data Libraries
- Criticality Safety Assessment in Specific Facilities
- Measuring Techniques for Criticality Parameters
- Criticality Accident Analysis and Alarm Systems

Copies of the General Information and Call for Papers can be obtained from: (1) the Conference Secretary, John Bentley, 062/A32, AEA Technology Winfrith, Dorchester, Dorset DT2 8DH, United Kingdom; (2) members of the organizing committee; (3) the BNFL exhibition stand at the ANS Winter Meeting at Washington in November; (4) Nigel Smith, by sending an `em' message to user `brissen'.

Please note that the deadline for abstracts (<250 words) to reach the Conference Secretariat is **30 December 1990**.

Calendar

Your attention is directed to the following events of interest.

December 1990

International Symposium on Heavy Ion Inertial Fusion, Dec. 3!6, 1990, Berkeley, California, sponsored by the Lawrence Berkeley Laboratory. Contact: M. Field, Lawrence Berkeley Laboratory, 1 Cyclotron Rd., MS 50B/2270, Berkeley, CA 94720 USA.

Regional Congress on Sea Dumping of Low Levels of Radioactive Wastes: Scientific Radiation Protection Considerations, Dec. 11!12, 1990, Paris, sponsored by the International Radiation Protection Association. Contact: G. Uzzan, SFRP, B.P. 72, F-92265 Fontenay-aux-Roses Cedex, France (phone 33 1 46 54 71 39).

January 1991

8th Symposium on Space Nuclear Power Systems, Jan. 7!10, 1991, in Albuquerque, New Mexico, sponsored by the U.S. Department of Energy, NASA, Los Alamos National Laboratory, Sandia National Laboratory, and the American Institute of Chemical Engineers. Contact: Mary Bragg, Univ. of New Mexico, Albuquerque, NM 87131 USA (phone 505-277-4950).

PIME '91)The International Workshop on Nuclear Public Information in Practice, Jan. 27!30, 1991, Annecy, France, sponsored by the European Nuclear Society. Contact: PIME '91 Secretariat, c/o ENS, P.O. Box 5032, CH-3001 Berne, Switzerland (phone 031 21 61 11).

February 1991

Nuclear News Marketing Conference, Feb. 4!6, 1991, Clearwater Beach, Florida, USA, sponsored by the American Nuclear Society. Contact: ANS Meetings Dept., 555 N. Kensington Ave., La Grange Park, IL 60525 (phone 708-579-8258).

7th All-Union Conference on Monte Carlo Methods in Computational Mathematics and Mathematical Physics, Feb. 19!21, 1991, in Novosibirsk, USSR. Contact: Dr. J. V. Bulavsky, Computational Center of Siberian Branch of Academy of Science, 6, prospect Ak.Lavrentyeva, Novosibirsk 630090, USSR (phone 356721).

April 1991

27th Annual Meeting of the National Council on Radiation Protection and Measurements, Apr. 3!4, 1991, Bethesda, Maryland. Contact: NCRP, 7910 Woodmont Ave., Suite 800, Bethesda, MD 20814 (phone 301-657-2652).

Advances in Mathematics, Computations, and Reactor Physics, Apr. 28!May 1, 1991, Pittsburgh, Pennsylvania, an International Topical Meeting sponsored by the ANS, Mathematics & Computation Division and the Reactor Physics Division. Contact: J. E. Olhoeft, Westinghouse Electric Corp., P.O. Box 355, WEC-E205, Pittsburgh, PA 15230-0355 USA (phone 412-374-5704).

1991 International High-Level Radioactive Waste Management Conference, Apr. 28!May 3, 1991, Las Vegas, Nevada, sponsored by the ANS and the American Society of Civil Engineers. Contact: Dillard B. Shipler, Technical Program Chair, American Nuclear Society, 555 N. Kensington Ave., La Grange Park, IL 60525 USA.

Conference on Occupational Radiation Protection, Apr. 29!May 3, 1991, Guernsey, United Kingdom, sponsored by the British Nuclear Energy Society. Contact: British Nuclear Energy Society, Secretariat, 1-7, Great George St., London SW1P 3AA U.K.

May 1991

Radiopharmaceutical Dosimetry Symposium, May 7!10, 1991, in Oak Ridge, Tennessee, sponsored by the Radiopharmaceutical Internal Dose Information Center. Contact: Audrey T. Schlafke-Stelson, Program Committee, 5th International Dosimetry Symposium, Radiopharmaceutical Internal Dose Information Center, Medical Sciences Division, Oak Ridge Associated Universities, P.O. Box 117, Oak Ridge, TN 37831-0117 USA (phone 615-576-3450).

June 1991

ANS Annual Meeting, June 2!6, 1991, Orlando, Florida. Contact: General Chair John A. DeMastry, Florida Power & Light Co., P.O. Box 14000, Juno Beach, FL 33408 (phone 407-694-3613).

5th International Symposium on Radiation Physics, June 10!14, 1991, Dubrovnik, Yugoslavia. Contact: Dr. Ante Ljubi‡i*f*, ISRP-5 Chairman, Ruder Bo×kovi*f* Inst., P.O. Box 1016, 41001 Zagreb, Yugoslavia (phone 41 425-563 or 41 434-467, Telex 21383 irbzg yu, Fax 41 425-497).

A Joint Symposium on Radiation Protection, June 16!23, 1991, in Winnipeg, Canada. Contact: Danny Buksak, Conference Chairman, The University of Manitoba, 191

Frank Kennedy Bldg., Winnipeg, Manitoba, R3J 2N2, Canada (phone 204-474-6633).

July 1991

2d International Symposium on Biophysical Aspects of Auger Processes, July 5!6, 1991, University of Massachusetts, Amherst, Massachusetts, sponsored by the American Association of Physicists in Medicine. Contact: Roger W. Howell, Dept. of Radiology, Div. of Radiation Research, M.S.B. F-451, Univ. of Medicine & Dentistry of NJ, 185 South Orange Ave., Newark, NJ 07103 USA (phone 201-456-5067).

Health Physics Society Annual Meeting, July 21!26, 1991, Washington, D.C. Contact: Nancy E. Newman, NIH Bldg. 21, Rm. 236, 9000 Rockville Pike, Bethesda, MD 20892 (phone 301-496-5774).

International Illinois Low Level Radioactive Waste (LLWM) Symposium: The Quiet Revolution)Innovations in Low-Level Waste Management, July 29!Aug. 1, 1991, Chicago, Illinois, sponsored by the Illinois Dept. of Nuclear Safety. Contact: Ms. P. Burnett, Illinois Dept. of Nucl. Safety, 1035 Outer Park Drive, Springfield, IL 62704 USA.

September 1991

ICNC '91, Sept. 9!13, 1991, Christ Church, Oxford, England, sponsored by AEA Technology, the OECD Nuclear Energy Agency, with cooperation from IAEA. Contact: John Bentley, 062/A32, AEA Technology Winfrith, Dorchester, Dorset DT2 8DH, England (phone 0305 203316; Fax 0305 202122).

Brazilian Meeting on Reactor Physics and Thermal Hydraulics, Sept. 17!20, 1991, São Paulo, Brazil. Contact: José Rubens Maiorino, IPEN-CNEN/SP, Caixa Postal 11049 (Pinheiros), 05499-São Paulo-SP-Brazil (phone 011 211-6011 Ext. 270; Telex 11 83592-IPEN-BR).

ICNC '91, International Conference on Nuclear Criticality Safety, September 1991, Oxford, United Kingdom. Contact: ICNC '91 Secretariat, Publicity Office, AEA Technology, Winfrith, Dorchester, Dorset DT2 8DH, United Kingdom (phone 0305 251888 ext 2739, Fax 0305 202122, Telex 41231).

October 1991

1991 Joint International Waste Management Conference, Oct. 21!26, 1991, Seoul, Korea. Contact: Mr. Larry C. Oyen, Sargent & Lundy, 55 East Monroe St., Chicago, IL 60603 (phone 312-269-6750, Fax 312-269-3475, Telex 280603).

November 1991

Nuclear Energy Forum, Nov. 10!13, 1991, San Francisco, California. Contact: Conference Office, U.S. Council for Energy Awareness, 1776 I Street, N. W., Suite 400, Washington, DC 20006-2495 USA.

OCTOBER ACCESSION OF LITERATURE

The following literature cited has been ordered for review, and that selected as suitable will be placed in the RSIC Information Storage and Retrieval Information System (SARIS). This early announcement is made as a service to the shielding community. Copies of the literature are not distributed by RSIC. They may generally be obtained from the author or from a documentation center such as the National Technical Information Service (NTIS), Department of Commerce, Springfield, Virginia 22161.

RSIC maintains a microfiche file of the literature entered into SARIS, and duplicate copies of out-of-print reports may be available on request. Naturally, we cannot fill requests for literature which is copyrighted (such as books or journal articles) or whose distribution is restricted.

This literature is on order. It is not in our system. Please order from NTIS or other available source as indicated.

RADIATION SHIELDING LITERATURE

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IAEA-CN-53/G-2-6; CONF-9010. . *Conceptual Design of a Tokamak Commercial Breeder*. . Huang, J.; Sheng, G.; Shi, H.; You, C.; Xie, Z.; Deng, B.; Feng, K.; Wang, X.; Xue, S.; Wang, Q.; Wu, L.; Zhang, L.; Zhang, G. . Oct. 1990. . IAEA. . 13th Int. Conf. Plasma Physics and Cont. Nucl. Fusion Res.

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