Radiation Safety Information Computational Center

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I don't know the key to success, but the key to failure is trying to please everybody. --Bill Cosby

Changes to the Computer Code and Data Collection

PSR-482/ REMIT5.1

The U.S. Nuclear Regulatory Commission, Washington, DC, and Science Applications International Corporation, Oak Ridge, Tennessee, contributed a newly frozen version of this code package for Radiation Exposure Monitoring and Information Transmittal System. REMIT 5.1 is designed to assist U.S. Nuclear Regulatory Commission (NRC) licensees in meeting the reporting requirements of the Revised 10 CFR Parts 20.1001 through 20.2401 as outlined in Regulatory Guide 8.7, Rev.1, *Instructions for Recording and Reporting Occupational Exposure Data*. REMIT is a PC-based, menu-driven system that facilitates the manipulation of database files to record and report radiation exposure information. REMIT 5.1 was developed in response to requests from Version 5.0 users to fix minor bugs in that release and was first released in August 2002. See the NRC website for more details http://www.reirs.com/remit.html.

REMIT runs on Pentium computers under 32-bit Windows operating systems including Windows2000 and Windows XP. It is written in Visual FOXPRO 6 and is distributed in executable format. Source files are not included, so it cannot be run on other computers. The reference document and software including REMIT executables, sample problems, databases and installation program are transmitted on a CD. Reference: NUREG/CR 6050 (June 1993). Visual FOXPRO 6; Personal computers (P00482IBMPC01).

DLC-223/FSXLIB-J33

The Nuclear Data Center at Japan Atomic Energy Research Institute, Tokai-mura, Naka-gun, Ibaraki-ken, Japan, through the Research Organization for Information Science and Technology (RIST), contributed this continuous energy neutron cross section library for use with MCNP. The NJOY 99.67 processing code from LANL was used to produce ACE-type cross section data from JENDL 3.3. FSXLIB-J33 was developed for solving neutron transport calculations with the CCC-700/MCNP4C code system. The data can also be used with other versions of MCNP. Photon production data are supplied for

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some nuclides in the expanded photon production format. Kerma factors are provided. The processing temperature of the cross sections is 300 K. The upper limit of the thermal region is 4.6 eV; the accuracy of pointwise cross-section reconstruction is 0.1%. The FSXLIB-J33 library includes 337 nuclides. The data library is transmitted as a GNU compressed Unix tar file and can be read on Windows with WinZIP 8.0 or later. The xsdir file and report are also included on the distribution CD. Reference: JAERI-Data/Code 2003-011 (July 2003). Note that the MATXS library is not included in the DLC-222 package. ASCII card images and 32-bit x86 CPU binary; Windows, Linux or Unix. (D00223/MNYCP/00).

CONFERENCES, COURSES, SYMPOSIA

RSICC attempts to keep its users and 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 via email to riceaf@ornl.gov with "conferences" in the subject line by the 20th of each month. Please include the announcement in its native format as an attachment to the message. If the meeting is on a website, please include the url.

Every attempt is made to ensure that the links provided in the Conference and Calendar sections of this newsletter are correct and live. However, the very nature of the web creates the possibility that the links may become unavailable. In that case, please call or mail the contact provided. Below is a chronological list of the conferences. More details (if available) are provided following the table.

Fall 2005 SCALE Training Courses at ORNL

Date	Title	Registration Fee*	Description
October 17–21, 2005	**SCALE Source Terms and Shielding Course**	$1800	SCALE shielding and depletion/decay sequences (including ORIGEN-ARP)
October 24–28, 2005	**KENO V.a Criticality Safety Course**	$1800	CSAS/KENO V.a (including KENO3D and GeeWiz
October 31– November 3, 2005	**TSUNAMI Sensitivity/Uncertainty Tools** (Experienced KENO users only)	$1500	1-D and 3-D sensitivity/uncertainty analysis using XSDRNPM and KENOV.a

*A late fee of $300 will be applied after September 17, 2005. A discount of $600 per each additional week will be applied for registration to multiple courses. Course descriptions can be found at http://www.ornl.gov/sci/scale/training.htm.

SCALE Source Terms and Shielding Course

The SCALE Source Terms and Shielding Course covers SAS2 and ORIGEN-ARP (depletion/source-term generation), SAS1/XSDRNPM (1-D neutron/gamma shielding), SAS4/MORSE-SGC (3-D Monte Carlo neutron/gamma shielding), and QADS/QAD-CGGP (3-D point

kernel gamma shielding). The course will feature the use of the SCALE Windows GUIs: OrigenArp for Windows, ORIGEN-S plotting utility PlotOPUS, and the ESPN shielding input processor for SAS4.

KENO V.a Criticality Safety Course

The SCALE KENO V.a Criticality Course focuses on KENO V.a and the associated criticality analysis sequences in CSAS. KENO V.a is a widely used 3-D multigroup Monte Carlo criticality safety code that has been in use for 20 years. It is a fast, easy-to-use code that allows users to build complex geometry models using basic geometrical bodies of cuboids, spheres, cylinders, hemispheres, and hemicylinders. Two-dimensional color plots of the geometry model can be generated in KENO V.a or the model may be viewed using the KENO3D 3-D visualization tool.

TSUNAMI Sensitivity/Uncertainty for Criticality Safety Course

Sensitivity coefficients produced by the TSUNAMI sequences predict the relative changes in a system's calculated k-eff value due to changes in the neutron cross-section data. TSUNAMI produces sensitivity data on a groupwise basis for each region defined in the system model. First-order perturbation theory is used to compute sensitivity coefficients from both cross-section and flux data. TSUNAMI folds the sensitivity data with cross-section covariance data to calculate the uncertainty in the calculated k-eff value due to tabulated uncertainties in the cross-section data. The applicability of benchmark experiments to the criticality validation of a given application can be assessed using S/U-based integral indices that can quantify system similarity. Attendees must have attended a KENO course or be experienced KENO users.

Introduction to MCNP

This introductory class will be held September 27–30, 2005, at Los Alamos National Laboratory for people who have never used MCNP or have very limited experience with the code and will include interactive computer sessions. Time will be available to discuss individual questions and problems with MCNP experts or to pursue in more detail topics mentioned in the talks. Topics to be covered include: New features in MCNP5, Basic geometry and advanced geometry, Source definitions, Tallies, Data, Variance reduction, Statistical analysis, Criticality, Plotting of geometry, tallies, and particle tracks, Neutron/photon/electron physics.

The class will use the newly released MCNP5. You are expected to have little or no experience with MCNP. A manual will be provided for use in the classroom. Address all correspondence regarding this class to Cheryl Royer, croyer@lanl.gov, phone: 505-665-2154. Detailed information and registration is available at http://laws.lanl.gov/x5/MCNP/aug05var.html.

MCNPX Workshops

Lead Teachers: Drs. John Hendricks, Gregg McKinney, Laurie Waters
Organizer: HQC Professional Services Contact: bill@mcnpxworkshops.com
More Information: http://mcnpxworkshops.com MCNPX homepage: http://mcnpx.lanl.gov

2005 Schedule		
Sept. 5–9	Advanced	Bologna, Italy
Oct. 31–Nov. 4	Intermediate	Santa Fe, NM

2006 Schedule		
January 9–13	Introductory	Las Vegas, NV
March 27–31	Intermediate	Capetown, South Africa
June 12–16	Introductory	Santa Fe, NM

MCNPX is the LANL all-particle, all-energy (eV-TeV) Monte Carlo transport code based on MCNP4C, LAHET, CEM, etc. MCNPX has been in active development since 1995 and is sponsored by the particle accelerator community. It has now become an accepted tool for a broad range of applications by nuclear engineers, physicists, and scientists. The MCNPX development effort has expanded the use of the Los Alamos tools to applications such as APT, waste transmutation, accelerator shielding and health physics, particle beam cancer therapy, space shielding and cosmic ray analysis, single event effects in semiconductors, radiography, and more detailed analysis of the effects of light and heavy ions in matter. In addition, the entire functionality of MCNP4C is retained. New variance reduction and data analysis techniques, many adapted from high-energy accelerator methodologies, have also been added, such as the extensive "mesh tally" capability which allows up to 3-d plotting of particle tracks, fluence and fluence-derived quantities, energy deposition, next event estimator generation contributions and particle sources.

The workshops include hands-on instruction, generally on PC Windows machines. Subject to participant export approval for the MCNPX beta test team, participants will be able to access the Fortran-90 version of MCNPX 2.4, the LA150 (150 MeV) cross-section data for over 40 isotopes for incident neutrons and protons and 12 for photonuclear interactions, and a notebook of viewgraphs.

Follow-up consultation for class participants will be provided.

The classes are taught by experienced MCNPX code developers and instructors. More information on code versions and capabilities is available at MCNPX Workshops web site http://mcnpxworkshops.com.

1. Statistical aspects of radioactivity, such as uncertainties, detection limits, novel statistics.
2. Radiation transport methods (Monte Carlo and deterministic), and nuclear data evaluations.
3. Calculating of the response and theoretical designing of radiation detectors.
4. Spectral deconvolution and fitting: alpha, beta, gamma spectroscopy.
5. Calculations of chemical structure and reactions involving radionuclides.
6. Transport models of radioactive contaminants in the environment.
7. Health physics calculations: dosimetry and risk assessment.
8. Medical radiation physics calculations: radiotherapy and imaging.
9. Nuclear sensing: modeling of well logging and gauges.
10. Computers in nuclear science laboratory, QA/QC, LIMS, etc.
11. Novel and sophisticated methods of nuclear data analysis.
12. Nuclear modeling of interest to counter-terrorism.
13. Novel computational algorithms of interest to applied nuclear science.

Registration and housing reservations will be available on-line in June and the final program appears in C&EN and on the ACS web page in June/July 2005. Full papers are due at the conference August/September 2005 in MS Word format only. Instructions will be distributed to the accepted speakers.

The ACS web page is www.chemistry.org. For further information please contact Thomas Semkow, Wadsworth Center, New York State Department of Health and SUNY, P.O. Box 509, Albany, NY 12201-0509, phone: +518-474-6071, fax: +518-474-8590, email: tms15@health.state.ny.us. The complete announcement as submitted by Thomas M. Semkow can be found at http://www.cofc.edu/~nuclear/2005WashingtonComputationSymposium.pdf.

International Topical Meeting on Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear and Biological Applications

The International Topical Meeting on Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear and Biological Applications will be held at the 'Palais des Papes,' Avignon, France, **September 12–15, 2005.**

The meeting offers an environment for interdisciplinary exchange among researchers in the nuclear field and comprises 19 general technical sessions and 13 invited technical sessions. Details on the sessions and on the organization of the meeting are given at the web site: http://mcavignon2005.cea.fr/.

NCSD 2005 Topical Meeting

The American Nuclear Society Nuclear Criticality Safety Division (NCSD) 2005 Topical Meeting will be held in Knoxville, Tennessee, September 18–22, 2005. The meeting theme, "Integrating Nuclear Criticality Safety into the Resurgence of Nuclear Power," will focus on major accomplishments in education, applications, methods development, and new initiatives. The technical program will cover topics that fall under the following main categories: Applications, Validation Studies/ Software Development, Education/Training/Qualification, and Emerging initiatives. The opening plenary session includes discussions by speakers knowledgeable about "TVA Projections for Future Nuclear Power Generation," "NASA Nuclear Program Overview," and "International Initiatives Specific to NCS." The website, http://meetingsandconferences.com/ncsd2005/, is the source for the latest information regarding the program and area information.

11th International Topical Meeting on Nuclear Reactor Thermal Hydraulics

NURETH is the foremost international technical meeting on nuclear technology thermal hydraulics. The French Section of the American Nuclear Society is very proud to organize and announce that the Eleventh Nureth Topical Meeting will be held in Avignon, France on October 2-6, 2005, in the historic Palace of the Popes in Avignon, France, **October 2–6, 2005.**

The main topics covered by the Nureth 11 meeting will be devoted to the thermal-hydraulics of existing and future nuclear power plants as foreseen by the Generation IV worldwide initiative. Normal operation and accidental situations are relevant topics of the conference. Topics encompass modeling, experiments, instrumentation and numerical simulations related to flow and heat transfer in nuclear reactors with a special emphasis on the advances of multiphase CFD methods.

For more information please go to http://nureth11.com/.

PHYSOR 2006

The Canadian Nuclear Society has announced that the ANS Reactor-Physics Topical PHYSOR-2006, "Advances in Nuclear Analysis and Simulation," will be held in Vancouver, BC, Canada, Sept. 10–14, 2006. The meeting is sponsored by the Reactor Physics Division of the ANS and co-sponsored by a host of international societies. The conference will be held at the Hyatt Regency in downtown Vancouver.

You are invited to visit the meeting website at http://www.cns-snc.ca/physor2006/ to obtain updated information and to download a copy of the call for papers. The conference chair is Benjamin Rouben, FCNS

Manager, Reactor Core Physics Branch, AECL Sheridan Park (phone 905-823-9060 x 4550, fax: 905-822-0567, email: roubenb@aecl.ca). The technical program co-chair is Ken Kozier, Atomic Energy of Canada Limited (AECL), Chalk River Laboratories, Chalk River, Ontario, Canada K0J 1J0 (Phone: +1-613-584-8811 + ext.5059, E-mail: physor2006@aecl.ca).

CALENDAR

September 2005

XIX Nuclear Physics Divisional Conference (NPDC19) of the European Physical Society, Sept. 5–9, 2005, Pavia, Italy. Contact: Saverio Altieri (email saverio.altieri@pv.infn.it, url http://www.pv.infn.it/~npdc19).

MCNPX Advanced Workshop, Sept. 5–9, 2005, Bologna, Italy. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com for details).

International Topical Meeting on Mathematics and Computation, Supercomputing, Reactor Physics and Nuclear Biological Applications (M&C 2005), Sept. 12–15, 2005, Avignon, France. Contact: Dr. Richard Sanchez (email avignon2005@drnsac.cea.fr; url http://mcavignon2005.cea.fr).

2005 NCSD Topical Meeting, Sept. 19–22, 2005, Knoxville, TN. For more information: http://meetingsandconferences.com/ncsd2005/.

Introduction to MCNP, Sept. 27–30, 2005, Los Alamos National Laboratory. Contact: Cheryl Royer, croyer@lanl.gov (phone: 505-665-2154, http://laws.lanl.gov/x5/MCNP/aug05var.html).

October 2005

11th International Topical Meeting on Nuclear Reactor Thermal Hydraulics, Oct. 2–6, 2005, Avignon, France. For more information: http://nureth11.com, nureth11@cea.fr.

10th Workshop on Monte Carlo Simulation of Radiotherapy Treatment Sources using the BEAM Code System, Oct. 3–6, 2005, Ottawa, Canada. Contact: Dave Rogers, Physics Department, Carleton University, 1125 Colonel By Drive, Ottawa, Ontario, Canada, K1S 5B6 (tel 613-520-2600x4374, fax 613-520-4061, e-mail drogers@physics.carleton.ca, url www.physics.carleton.ca/~drogers/BEAM/course/brochure.html.)

SCALE Source Terms and Shielding Course, Oct. 17–21, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

KENO V.a Criticality Safety Course, Oct. 24–28, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

TSUNAMI Sensitivity/Uncertainty Tools, Oct. 31–Nov. 3, 2005, Oak Ridge National Laboratory, Oak Ridge, TN. Contact: http://www.ornl.gov/sci/scale/training.htm.

MCNPX Intermediate Workshop, Oct. 31–Nov. 4, 2005, Santa Fe, NM. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

November 2005

ANS Winter Meeting and Nuclear Technology Expo, "Talk About Nuclear Differently: A Good Story Untold," November 13–17, 2005, Washington, D.C. Contact: http://www.ans.org/meetings/.

January 2006

MCNPX Introductory Workshop, Jan. 9–13, 2006, Las Vegas, NV. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

March 2006

HEART Conference, March 6–10, 2006, Sunnyvale, CA. Contact: Technical Program Chair, Dennis Breuner (phone 858-720-7072, email dbreuner@titan.com).

MCNPX Intermediate Workshop, Mar. 27–31, 2006, Capetown, South Africa. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

June 2006

MCNPX Introductory Workshop, June 12–16, 2006, Santa Fe, NM. Contact: Bill Hamilton (phone 806-928-6021, email bill@mcnpxworkshops.com, url http://mcnpxworkshops.com).

September 2006

PHYSOR-2006, "Advances in Nuclear Analysis and Simulation," will be held in Vancouver, BC, Canada, Sept. 10–14, 2006. Contact: Ken Kozier, Technical Program Co-Chair, Atomic Energy of Canada Limited (AECL), Chalk River Laboratories, Chalk River, Ontario, Canada K0J 1J0 (Phone: +1-613-584-8811 + ext.5059, E-mail: physor2006@aecl.ca, web http://www.cns-snc.ca/physor2006/).