RSIC Newsletter

RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION • FOR THE U.S. ATOMIC ENERGY COMMISSION

POST OFFICE BOX X •
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The legitimate aim of criticism
is to direct attention to the excellent.
The bad will dig its own grave,
and the imperfect may safely be left
to that final neglect from which no amount
of present undeserved popularity can rescue it.
.....Bovee

INTERNATIONAL SHIELDING MEET BOOKLET AVAILABLE

The organizing committee of the Fourth International Conference on Reactor Shielding to be held in Paris, France, October 9-13, 1972, has shipped to RSIC copies of the General Information Booklet to be distributed to interested members of the USA shielding community. The booklet describes the purpose, location and date, provisional program, languages, submission of papers and summaries, instructions to authors, hotel reservation and other forms. A copy may be secured by calling 615-483-8611/3-6944 (FTS 615-483-6944) or by writing to RSIC.

Dates to remember: provisional hotel reservation form should be mailed before January 15, 1972, and paper submission form should be mailed before March 15, 1972.

RSIC SEMINAR-WORKSHOP HELD NOVEMBER 15-17

Eighty-three participants from 27 separate installations, including one foreign country, attended the RADIATION TRANSPORT IN AIR Seminar-Workshop held at the Oak Ridge National Laboratory over the three-day period, November 15-17, 1971. Sponsored by the Defense Nuclear Agency, members of the Science Applications, Inc. staff joined RSIC in planning for the seminar and conducted the workshop which followed.

Reviews of cross sections, computer codes (both transport and data processing), transport data, and empirical models were presented. The proceedings, ORNL-RSIC-33, will be published as soon as possible.

F. C. Maienschein, ORNL Neutron Physics Division Director, spoke at a dinner meeting on the subject of international information exchange in the area of nuclear physics.

CURRENT WORK AND PROBLEMS

We are pleased to have received the following report on *CURRENT WORK AND PROBLEMS* from T. Fuse of the Ship Research Institute, Nuclear Ship Division, Tokyo and Tokai-Branch at Tokai, Ibaraki-ken, Japan. Experimental and theoretical research is being done on reactor shielding.

A neutron transport code PALLAS, for one-dimensional plane and spherical and also two-dimensional cylindrical geometries, has recently been completed. This code is based on the discrete ordinates-numerical integration of the integral form of the transport equation. Gamma-ray transport routines are being added to the PALLAS code for calculations of primary and secondary gamma-ray transport and also of gamma-ray heat generation.

Systematic series of measurements are being made to obtain fast neutron angular flux spectra using a swimming pool type reactor and a linear accelerator for the examination of the validity and the calculational accuracy of PALLAS. For the reactor experiments, proportional counters, a scintillation counter, a semiconductor spectrometer and activation foils are used. Time-of-flight measurements of neutron angular flux spectra are being made using the linear accelerator. It should be noted that PALLAS can give quite reasonable results for the forward directed neutrons in MeV region, which are important in fast neutron transport.

Neutron and gamma-ray streaming is being investigated for cylindrical ducts by experiment and two-dimensional PALLAS calculations.

An attempt is being made to get the optimum arrangement of laminated shields. A shielding optimization code SOLA was written based on differential dynamic programming. To improve the attenuation calculation in SOLA the application of PALLAS is being tried. Experiments were performed to obtain the optimum arrangement of laminated iron-water shields.

Mock-up experiments of ship structure, as well as on-board experiments have been carried out to examine the validity and calculational accuracy of the MARINE code, which was designed for the calculation of gamma-ray dose rate distribution transmitted through ship structures.

GOLDSTEIN'S BOOK ON SHIELDING REPRINTED

The venerable shielding text, *FUNDAMENTAL ASPECTS OF REACTOR SHIELDING*, by Herbert Goldstein, has been reprinted and is available from

Johnson Reprint Corp.
111 Fifth Ave.
New York, N. Y.

for $14.50. Although originally published in the late 1950's, the basic discussions of radiation sources, interaction with matter, and attenuation concepts are still useful.

ADDITIONS TO THE COMPUTER CODE COLLECTION

Operable, tested with a sample problem, and available for distribution are the following code packages:

CCC-170/DISDOS — Calculation of Dose Distribution in Human Phantoms Irradiated by External Photon Sources, contributed by the Central Research Institute for Physics, Budapest, Hungary. Reference: KFKI-71-12. FORTRAN IV.

CCC-171/MUSPALB — Albedo Calculation of Multigroup Spectra of Neutrons Transmitted Through Multilayer Slab Shields, contributed by the Central Research Institute for Physics, Budapest, Hungary. Reference: KFKI-70-37. FORTRAN IV.

CCC-172/TRANZIT — Multigroup Time-Dependent Discrete Ordinates Transport Code in (ρ,z) Cylindrical Geometry, contributed by the Los Alamos Scientific Laboratory. Reference: LA-4575. FORTRAN IV, CDC 6600.

PSR-13E/SUPERTOG — Data Generator: Fine Group Constants and P_n Scattering Matrices from ENDF/B Cross Section Data. PSR-13E is a CDC 6400 version contributed by Kaman Nuclear, Colorado Springs, Colorado and the Oak Ridge National Laboratory. Reference: ORNL-TM-2679.

PSR-30/VIXEN — A Code to Check Physical Consistency of Photon-Production Data in Revised ENDF Format, contributed by the Los Alamos Scientific Laboratory. Reference: LASL-4739 (ENDF-155). FORTRAN IV, CDC 6600-7600 and IBM 360. VIXEN is a revision and extension of PHOXE and supersedes it.

PSR-36/CONVERT — An IBM-to-CDC Program Conversion Code, contributed by the Los Alamos Scientific Laboratory and the Aerospace Research Applications Center, Bloomington, Indiana. Reference: LA-4555. Written for the CDC 6600 in FORTRAN IV, CONVERT is useful in converting programs written for the IBM computers to be run on the CDC computers.

PSR-37/SASSI — Calculation of Nucleon Scattering from a Spherical Optical Potential, contributed by the CNEN Centro di Calcolo, Bologna, Italy, through the ENEA Computer Programme Library. Reference: CNEN-CEC (68)18. FORTRAN IV, IBM 7094 and 360.

PERSONAL ITEMS

RSIC has been informed of the following changes of address: *Charles W. Hill* from Lockheed-Georgia Company to the Huntsville, Alabama, office of Science Applications, Inc.; *W. T. Wyatt, Jr.* from the U. S. Army MERDC, Fort Belvoir, Virginia, to Harry Diamond Laboratories, Washington, D. C.; *Lt. Col. Lewis W. Pettit* from the USAMC Main Battle Tank Engineering Agency, Warren, Michigan, to an overseas address; *Richard Madey* from Clarkson College, Potsdam, New York, to the Smith Laboratory of Physics, Kent State University, Ohio; and *José Ribeiro Da Costa* from Gulf General Atomic in San Diego to the National Commission of Atomic Energy, Rio de Janeiro, Brazil.

Brian McGregor has arranged to spend another year working in the ORNL Neutron Physics Division. He is employed by the AAEC Research Establishment at Lucas Heights, New South Wales, Australia.

VISITORS TO RSIC

Visitors to RSIC during the month of November were: T. E. Albert, C. M. Napolitano, and B. E. Phillips, Martin-Marietta Corp., Orlando, Fla.; F. Anderson and J. J. Sapyta, Babcock and Wilcox, Lynchburg, Va.; M. Awschalom, National Accelerator Laboratory, Batavia, Ill.; M. O. Burrell, NASA Marshall Space Flight Center, Alabama; N. R. Byrn, Science Applications, Inc., Huntsville, Ala.; Constance K. Cline, University of Rochester, Rochester, N. Y.; R. J. Cloutier and Evelyn Watson, Oak Ridge Associated Universities, Oak Ridge, Tenn.; C. Czerepak, Picatinny Arsenal, Dover, N. J.; J. R. Da Costa, Comissao Nacional de Energia Nuclear, Rio de Janeiro, Brazil; E. H. Brehm, D. Fleischhammer, and A. Hald, Brown Boveri & Cie Co., Mannheim, Germany; A. Futterer, Ballistic Research Laboratories, Aberdeen Proving Ground, Md.; J. D. Gordon, TRW, Redondo Beach, Calif.; Luisa Hansen, Lawrence Livermore Laboratory, Livermore, Calif.; H. J. Hennecke, Wright-Patterson AFB, Ohio; D. Irving, Oak Ridge, Tenn.; V. A. Kamath, Bhabha Atomic Research Centre, Bombay, India;

W. Berning, G. Connor, and D. C. Kaul, Defense Nuclear Agency, Washington, D.C.; R.D.McLaren, Wright-Patterson AFB, O.; W.McNamara, DASIAC, Santa Barbara, Calif.; S. Reimann, Arbeitgruppe fuer Bautechnischen Strahlenschutz, Hannover, Germany; L. F. Rodriguez, University of Cincinnati, Cincinnati, O.; R. M. Saqui, Cornell Aeronautical Laboratory, Buffalo, N. Y.; C. Slater, University of Tennessee, Knoxville, Tenn.; P. E. Thiess, University of Illinois, Urbana, Ill.

We Hang our Heads department: Missing from the October list of visitors were the names of *L. Boxer*, European Nuclear Energy Agency, Paris, France; *P. B. Hemmig*, U. S. Atomic Energy Commission, Washington, D. C.; *T. Lefvert*, Research Institute of National Defence, Stockholm, Sweden; and *H. Penkuhn*, Euratom CCR, Ispra, Italy.

NOVEMBER 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 22151.

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

Special bibliographies and abstracts of the literature in the RSIC system may be requested through the Selective Dissemination of Information (SDI) Service, which is available to all.

REACTOR AND WEAPONS SHIELDING

A/CONF. 49/P-839 (CONF-710901-57) *September 1971*

Current Developments in Long-Term Radioactive Waste Management
F. L. Culler, J. O. Blomeke, W. G. Belter
Prepared for 4th International Conference on the Peaceful Uses of Atomic Energy, Geneva, Switzerland (6 Sep. 1971)
Avail.: Dep.; NTIS

AD-724071 *March 1971*

Tester, Soil, Density and Moisture, Nuclear Method
K. L. Brown
Avail.: NTIS

AD-725161 May 1971

A Numerical Treatment of Scattering and Fluorescence in Plane Geometry
R. H. Fisher, R. A. Kruger
Avail.: NTIS

AECL-3989 August 1971

A Gamma Monitor for Measuring Environmental Gamma Doses and Dose Rates
A. R. Jones
Avail.: Scientific Document Distribution Office, Atomic Energy of Canada, Ltd., Chalk River, Ontario ($0.50)

ANL-7678 (N71-25742) March 1970

Fission-Product Spectra from Fast and Thermal Fission of U-235 and Pu-239
K. A. Varterssian, L. Burris
Avail.: NTIS

ANL-7749 (N71-28105) December 1970

Yields of Fission Products for Several Fissionable Nuclides at Various Incident Neutron Energies
K. F. Flynn, L. E. Glendenin
Avail.: NTIS

BNL-tr-428

Investigation of Left-Right Asymmetry in Compton Scattering by Polarized Electrons
V. M. Lobashov, L. M. Smotritski
Avail.: Dep.; NTIS

CEA-CONF-1762 1971

Acceleration Technique for the Solution of Boltzmann Integral Equation
A. M. Brun, A. Kavenoky

CONF-701208 December 1970

The Physics Problems of Reactor Shielding. Report of a Joint ENEA/IAEA Specialist Meeting, Paris, December 1970.
Avail.: OECD Publications Center, Suite 1207; 1750 Pennsylvania Ave., NW, Washington, D.C. 20006; Price $5.00.

CONF-710107 April 1971

Second Conference on Transport Theory, January 26-29, 1971 (Los Alamos Scientific Laboratory, New Mexico)
Avail.: NTIS

CONF-710601-4 1971

Implications of Metal Swelling in Fast Reactor Design
P. R. Huebotter, T. R. Bump

COO-2049-8 June 1971

Orders-of-Scattering Calculation for the Reflection of Collimated Poly-Energetic Fast Neutrons from a Six-Inch-Thick Steel Slab.
J. W. Thiesing, W. Meyer
Avail.: Dep.; NTIS

COO-2049-9 August 25, 1971

Orders-of-Scattering Method for Fast-Neutron Transport
J. W. Thiesing, Walter Meyer
Avail.: Dep.; NTIS

EACRP-A-135, pp. 15-20

Shielding
D. E. Bendall
(In: MODULAR CODING SYSTEM FOR REACTOR CALCULATIONS)

EGG-1183-2283 (CONF-711009-6)

Monte Carlo Calculation of Sodium Iodide Scintillation Detector Response Function
A. A. O'Dell
(From Joint Meeting of the American Nuclear Society (October 1971))
Avail.: Dep.; NTIS

EGG-1183-2284 (CONF-711009-7)

Monte Carlo Transport Analysis for Finite Ground-Distributed Gamma Sources
A. A. O'Dell, N. A. Harris
(From Joint Meeting of the American Nuclear Society (October 1971))
Avail.: Dep.; NTIS

EURFNR-945 (KFK-1422) June 1971

Check of Nuclear Data and Methods of Calculation by Integral Experiments
E. Kiefhaber
Avail.: Dep.; NTIS (U.S. Sales only)

HEDL-TME-71-65 August 1971

Cross Sections for Preliminary Design of FTR, FTR Set No. 200
J. V. Nelson
Avail.: Dep.; NTIS

IAE-1986 1970

Nuclear Data for Thermonuclear Reactors
Yu. F. Chernilin, G. B. Yan'kov
Avail.: Dep.; NTIS (U.S. Sales only)

ICRP Publication 14, 1969

Radiosensitivity and Spatial Distribution of Dose.
Radiation Protection.
ICRP
Avail.: Pergamon Press, Inc., Elmsford, N. Y.

ICRP Publication 15, 1969

Protection Against Ionizing Radiation from External Sources. A Report by Committee 3 of the International Commission on Radiological Protection. Radiation Protection.
Avail.: Pergamon Press, Inc., Elmsford, N. Y.

JAERI-MEMO-4189 (N71-29059) (In Japanese) *November 1970*

Table of Half-Life, Gamma-Ray Energy, and Intensity of Radioisotopes
K. Kumagai
Avail.: Dep.

JPRS-54305 *October 22, 1971*

Bulletin of the Nuclear Data Center - USSR
Joint Publications Research Service
Avail.: NTIS

NASA-TM-X-52978 (E-6187, N71-19675) *1971*

A Preliminary Shield Design for a SNAP-8 Power System
I. M. Karp, L. Soffer, M. R. Clark
Avail.: NTIS

NASA-TM-X-66937 (N71-20208) *1970*

Simulation of Radiation from RTG Power Sources
P. A. Newman, Jr.
Avail.: NTIS

ORNL-TM-3232 *February 1971*

Analysis of the Diffusion of Radioactivity from Encapsulated Wastes
M. J. Bell
Avail.: NTIS

ORNL-TM-3301 *February 1971*

Publications of the Radioactive Waste Disposal Section, Health Physics Division
K. E. Cowser
Avail: NTIS

ORNL-TM-3492 *October 1971*

Nucleation and Growth of Voids in Stainless Steels During Fast Neutron Irradiation
E. E. Bloom

ORNL-TM-3542 November 1971

Determination of the Fast Neutron Flux and Spectrum in the Oak Ridge Bulk Shielding Reactor with Application to Radiation Damage Experiments
J. D. Jenkins
Avail.: NTIS

ORNL-TM-3596 October 13, 1971

Monte Carlo Analysis of the Exact Geometric Mockup of ZPR-III Assembly 48
S. N. Cramer

PB-201156 1970

Nuclear Moisture Density Gauges
L. J. Lanz, B. Stroud
Avail.: NTIS

RD/B/N-1722 (N71-30142) June 1970

Predicting the Heavy Element Composition of Irradiated Reactor Fuels
R. H. Clarke
Avail.: Dep.

RFP-1466 (N71-29631) March 12, 1971

Method to Determine Fast and Thermal Neutron Fluxes by Foil Activation Analysis
R. L. Murri, D. G. Vasilik
Avail.: NTIS

STI/PUB-269 (CONF-701112) 1971

Advances in Physical and Biological Radiation Detectors
Proceedings Series
Avail.: IAEA ($21.00)

WHAN-SA-11 September 9, 1970

Comparison of Two-Dimensional and Three-Dimensional Neutronics Calculations for the FTR
R. W. Hardie, W. W. Little
Avail.: NTIS

Brit. J. Radiol., 44, 109-15 (Feb. 1971)

Surface Effects of High-Energy X-Rays at Oblique Incidence
W. Jackson

CRC Crit. Rev. Environ. Contr., 2(1), 81-124 (April 1971)

Radiation Protection Standards
L. S. Taylor

Health Phys., 20(5), 467-73 (May 1971)

Dosimetric Examinations of Scattered Gamma Radiation.
L. Bozoky

Health Phys., 20(5), 499-504 (May 1971)

Radiation Protection Trends in the United States
L. S. Taylor

Health Phys., 20(5), 517-27 (May 1971)

What Quality Factor
H. W. Patterson, J. T. Routti, R. H. Thomas

Health Phys., 20(5), 529-31 (May 1971)

Quality Factor: A Sound Concept
H. J. Dunster

Health Phys., 20(6), 653-5 (June 1971)

Criticism of Existing Tabulations of Mass Energy Transfer and Mass Energy Absorption Coefficients
G. A. Carlsson

Health Phys., 20(6), 669 (June 1971)

Comments on Radiation Quantities and Their Significance in Health Physics. Parts 1 and 2
H. O. Wyckoff

Int. J. Appl. Radiat. Isotop.; 22(6), 325-9 (June 1971)

Neutron Dose Distributions for ^{252}Cf Sources
P. S. Nagarajan, Dayashankar, G. Venkataraman

Izotopy, No. 17, 23-9 (1970) (In Russian)

Some Regularities of Forming Gamma Radiation Dose Fields in Shielding Structures and Shelters
B. P. Bulatov, T. A. Stoicheva

J. Math. Anal. Appl., 34(3), 628-43 (June 1971)

Internal Values in Particle Transport by the Method of Invariant Imbedding
P. Nelson, Jr., M. R. Scott

Nucl. Sci. Eng., 46(1), 42-52 (Oct. 1971)

Predictions of the Energy Dependence of the Average Yield of Neutrons per Fission of Isotopes of Thorium, Uranium, and Plutonium
R. J. Howerton

Nucl. Technology, 12(3), 307-313 (Nov. 1971)

Density Determinations of Alkali Metals by a Gamma Radiation Attenuation Technique
I. G. Dillon, F. E. LeVert, P. A. Loretan, G. U. Menon, F. M. Siddiqi, H. J. Tarng

Nucl. Technology, 12(3), 329-331 (Nov. 1971)

A Study of Mine Detection by Means of Neutron-Induced Gamma Rays
F. R. Mynatt, R. G. Alsmiller, Jr., L. R. Williams

Indian J. Pure Appl. Phys., 8(12), 845-6 (Dec. 1970)

Effective Atomic Numbers in Alloys for Incoherent Scattering of Gamma Rays
A. Khayyoom, K. Parthasaradhi

J. Nucl. Sci. Technol. (Tokyo), 8(6), 342-347 (June 1971)

Terrestrial Gamma-Radiation Field in Natural Environment
S. Minato

J. Nucl. Sci. Technol. (Tokyo), 8(9), 481-491 (Sept. 1971)

Spatial Distributions of Neutrons and Photons in a Duct Filled with a Herical Iron Plug
T. Nakamura, T. Kanazawa, Y. Hayashi, T. Hyodo

Nuclear Data Tables, 9(4-5), 265-468 (July 1971)

The 1971 Atomic Mass Evaluation
A. H. Wapstra, N. B. Gove

Nucl. Sci. Eng., 46(2), 169-178 (Nov. 1971)

Regional-Dependent Reactor Kinetics
D. S. Gooden, T. F. Parkinson

Nucl. Sci. Eng., 46(2), 309-314 (Nov. 1971)

New Difference Schemes for the Neutron Transport Equation
W. H. Reed

Nucl. Sci. Eng., 46(2), 317-320 (Nov. 1971)

Positive Difference Schemes in Neutron Spectral Codes
T. Kulikowska

Phys. Med. Biol., 16(4), 706- (1971)

Organic Scintillation Spectrometer for Neutron Shielding Studies
F. P. Szabo

Radiography, 37, 88-90 (April 1971)

Attenuation of X-Rays in the Human Body
M. Cohen

Soviet J. At. Energy (English Transl.), 29(3), 913 (Sept. 1970)

Determination of the Spectral and Angular Distribution of γ-Quanta in Flat Barriers Containing Radiation Sources
S. A. Churin

BOOK, pp. 819-929 *1969*

APPLIED RADIATION PROTECTION AND CONTROL. VOL. 2.
ARTICLE: Radiation Dosimetry Formulas
J. J. Fitzgerald
New York, Gordon and Breach, Science Publishers, Inc.

BOOK *1970*

NUCLEAR REACTOR THEORY
George Irving Bell, Samuel Glasstone
New York, Van Nostrand Reinhold ($24.95)

BOOK (IN GERMAN) *1964*

RADIATION FIELD OF THE REACTOR. Calculations of Neutron-, Gamma-, and Heat Balance for Reactor Shielding.
Gerfried Hehn
Thiemig-Taschenbuecher, Band 22. Muenchen; Verlag Karl Thiemig KG

SPACE AND ACCELERATOR SHIELDING

CEA-R-4188 (In French) *1971*

Shielding Problems Set by the Use of a Natural Uranium Target with a Linear Electron Accelerator. Shielding and Safety Systems Necessary
Henry Vialettes, Jean Rocchesani, Pierre Lemure
Avail.: Dep.; NTIS (U.S. Sales only)

JINR-P2-5991 (In Russian) *1971*

Intranuclear Cascades in Light Nuclei
O. B. Abdinov, V. S. Barashenkov
Avail.: Dep.; NTIS (U.S. Sales only)

JUL-751-PC (In German) *April 1971*

Shielding of Fast Neutrons from the Cyclotron for Medical-Biological Research
P. F. Sauermann
Avail.: Dep.; NTIS (U.S. Sales only)

J. Spacecraft Rockets, 8(7), 773-7 (July 1971)

Active Radiation Shield for Cylindrically Shaped Vehicles
S. H. Levine, R. Lepper

Trans. Amer. Nucl. Soc., 14(1), 68-69 (June 1971)

The Composition of Atmospheric Cosmic Rays Near Solar Maximum
K. O'Brien

Trans. Amer. Nucl. Soc., 14(1), 339 (June 1971)

On the Accuracy of Transport Calculations Using Moments Methods
L. V. Spencer

COMPUTER CODES LITERATURE

AD-727 636 — *July 1971* — *DELFIC, SEER*

Simplified Fallout Computational Systems for Damage Assessment
by Hong Lee, Paul W. Wong, Stephen L. Brown, Stanford Research Institute, Menlo Park, Calif.
Avail.: NTIS

AD-727 676 — *June 1971* — *MOD-5*

MOD-5: A Computer Code for Calculations of Neutron Time-Energy Distributions in the Slowing Down Region
by Theodore J. Williamson, Naval Postgraduate School, Monterey, Calif.
Avail.: NTIS

AERE-R-6622 — *March 1971* — *SPECIFIC II*

SPECIFIC II. A Monte Carlo Program for High Energy Neutron Spectrum Estimation
by D. W. Holbrough, B. A. Lipscombe, Atomic Energy Research Establishment, Harwell, England
FORTRAN IV; IBM 360
Avail.: Dep.; NTIS (U.S. Sales only)

BMI-1913 — *August 1971* — *FRCRL2*

FRCRL2: A Computer Code for Calculating Fission-Product Release in Reactor Accident Analyses. Topical Report, Task 18.
by Robert Ritzman, David L. Morrison, Battelle Columbus Laboratories, Ohio
Avail.: Dep.; NTIS

BNWL-B-69 and Appendix E — *June 1971* — *RACER*

RACER: A Computer Program for Calculating Potential External Dose from Airborne Fission Products Following Postulated Reactor Accidents
by D. L. Strenge, M. M. Hendrickson, E. C. Watson, Battelle-Northwest, Richland, Wash.
FORTRAN; UNIVAC 1108
Avail.: Dep.; NTIS

CONF-710302-3 1970 ETOG, ETOP, PHROG

Some Problems Encountered Processing ENDF/B Data with ETOG and ETOP
by R. A. Grimesey, G. L. Singer, Idaho Nuclear Corp., Idaho Falls, Id.
FORTRAN IV
Avail.: Dep.; NTIS

DASA-1800-IV (AD-727613) March 1971 DELFIC

A New Fallout Transport Code for the DELFIC System: The Diffusive Transport Module
by Hillyer G. Norment, Elihu J. Tichovolsky, Arcon Corp., Wakefield, Mass.
Avail.: NTIS

DASA-2605 August 1971 TRACE

A Two-Dimensional Characteristic Ray Code Development
by P. M. Campbell
FORTRAN; UNIVAC 1108
Avail.: SAI

EIR-189 (In French) December 1970 SHADOK

Integral Transport Equation in One-Dimensional Cylindrical Geometry. Polynomial Approximation and Linear Anisotropic Scattering. Part II. Characteristics and Numerical Applications of the SHADOK Code: Possible Extensions of the Method
by J. Ligou, P. A. Thomi. EIR, Wuerenlingen, Switzerland
FORTRAN; CDC 6500
Avail.: Dep.; NTIS (U.S. Sales only)

GEAP-13740 August 1971 TDOWN

TDOWN - A Code to Generate Composition and Spatially Dependent Cross Sections
by C. L. Cowan, B. A. Hutchins, J. D. Turner
FORTRAN IV, GE 635

HEDL-TME-71-36 (ENDF-143) March 1971 ETOX

Group Constants for Fast Reactor Calculations
by R. B. Kidman, R. E. Schenter, WADCO Corp., Richland, Wash.
FORTRAN IV

INR-P-1278 1971 BIGG

Positive Difference Schemes in Spectral Codes
by Teresa Kulikowska, Institute of Nuclear Research, Warsaw, Poland
ALGOL
Avail.: Dep.; NTIS (U.S. Sales only)

J. Radioanal. Chem.; 6: No. 1, 241-71 (Sept. 1970) *SPECTRA*

SPECTRA: A Computer Program for Gamma-Ray Analysis
by G. A. Borchardt, G. W. Hoagland, R. A. Schmitt, Oregon State University, Corvallis, Oregon
FORTRAN IV

KFK-1381 (In German) *March 1971* *DTK, NUSYS*

The One-Dimensional Transport Program DTK
by C. Guenther, W. Kinnebrock, Kernforschungszentrum, Karlsruhe, West Germany
FORTRAN IV
Avail.: Dep.; NTIS (U.S. Sales only)

LA-4676 *May 1971* *TWODIM*

TWODIM: A Computer Code for Unfolding Diametral Gamma-Ray Scans on Reactor Fuel Elements
by B. K. Barnes, J. R. Phillips, Los Alamos Scientific Laboratory, New Mexico
FORTRAN IV; CDC 6600
Avail.: Dep.; NTIS

NWEF-1081 *July 1971* *CDR*

CDR - A Program to Calculate Constant Dose Ranges from a Point Source of Radiation in the Atmosphere
by J. E. Campbell, S. A. Dupree, M. L. Forsman
FORTRAN IV; CDC 6600
Avail.: Dep.; NTIS

ORNL-TM-3322 *March 1971* *ANISN, THERMOS*

Neutron Flux Spectrum in the HFIR Target Region
by F. B. K. Kam and J. H. Swanks, Oak Ridge National Laboratory
FORTRAN IV; IBM 360
Avail.: NTIS

SC-DR-71-0320 *September 1971* *COLAPS, EDIT, MODIFY*

Processing Codes for Group-Averaged Discrete Ordinates Cross-Section Tables
by Kenneth G. Adams, James H. Renken, and Joann H. Flinchum, Sandia Laboratories, Albuquerque, N.M.
FORTRAN IV; CDC 6600

Season's Greetings

And best wishes for the coming year