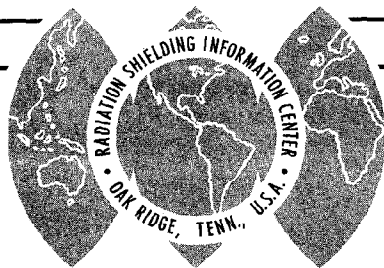


RSIC Newsletter



RADIATION SHIELDING INFORMATION CENTER

OAK RIDGE NATIONAL LABORATORY

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

POST OFFICE BOX X •
OAK RIDGE, TENNESSEE 37831

No. 55

June, 1969

*The knowledge we have acquired
ought not to resemble a great shop
without order and without an inventory;
we ought to know what we possess
and be able to make it serve us in our need.*

-Leibnitz

LAST CALL TO RETURN GREEN CARDS

Most subscribers have returned the January mailing of green 5x8 in. cards indicating their desire to remain on the RSIC literature distribution. We are pleased with the kind words many of you have added to the cards you returned.

As of July 1, 1969, we expect to remove the names of people who did not respond. If you were added to the list since January, you will not need to return a card.

BENCHMARK PROBLEMS PUBLISHED

The Shielding Benchmark Problems, edited by A. F. Profio, is now available as ORNL-RSIC-25 (ANS-SD-9). It is in a looseleaf binder so future updating can be accomplished. The first four problems selected by the ANS-6 Benchmark Problems Group and published by RSIC are:

- 1.0 Fast Neutron Spectrum from a Point Fission Source in Infinite Graphite
by A. E. Profio
- 2.0 Gamma-Ray Spectrum from a Point ^{137}Cs Source in Infinite Water
by H. L. Beck
- 3.0 Neutron Spectrum from Point Fission and 14 MeV sources in Infinite Air
by F. A. Straker
- 4.0 Gamma-Ray Dose Above a Plane Source of ^{60}Co on an Air-Ground Interface
by C. W. Garrett

We had some difficulties in the mailing and request any person or group receiving extra copies to please return them.

Proposed revisions and additional contributions for these or additional problems should be sent to RSIC for transmittal to the BPG chairman.

CODE DEVELOPERS, PLEASE GIVE US DOCUMENTS

It would be a big help to us in our code distribution if we had on hand spare copies of the documentation for codes added to the collection. If you are developing a code which you expect to place with us, please put RSIC on the document distribution list for about 50 copies.

CLEARINGHOUSE OFFERS NEW MICROFICHE SERVICE

Selective Dissemination of Microfiche (SDM), a new subscription service for obtaining microfiche copies of scientific and technical documents grouped by field of interest is available from the Commerce Department's Clearinghouse for Federal Scientific and Technical Information. CFSTI customers will be able to order, from any of several hundred basic categories, unclassified reports and translations of foreign technical literature sponsored by over 100 Federal agencies and other organizations. Orders can be placed by subject category, by originating agency (DoD, NASA, AEC, etc.) or by subject category within an agency collection.

The new service provides a faster and more economical method of obtaining copies of the latest scientific and technical documents in selected fields of interest. It requires less effort for the user to get the information he needs since it eliminates individual orders for documents.

Some examples of possible SDM selections are: all Department of Defense documents or all NASA documents, all documents on electronics or chemical processing in all agency collections, or electronic documents sponsored only by NASA or documents on nuclear instrumentation in the AEC collection. One of the categories is shielding.

The automatic distribution feature of SDM permits the Clearinghouse to offer the new service at 28 cents per title. SDM distribution will be made twice each month at the same time documents are announced for public sale by the Clearinghouse. For additional information, write to: Clearinghouse (152.12), U.S. Department of Commerce, Springfield, Virginia 22151.

ACCELERATOR DOSIMETRY CONFERENCE IN NOVEMBER

The Second International Conference on Accelerator Dosimetry and Experience will be held at Stanford, Calif., November 5-7, 1969. Emphasis

will be on accelerators below 100 MeV. Papers are desired on the following topics:

- Radiation protection around electron and proton accelerators
- Problems and solutions of the new higher beam power accelerators
- Dosimetry of high-energy photons, hadrons, leptons, etc.
- Health physics experience associated with accelerators below 100 MeV
- Radiation alternation measurements and calculations, particle yields neutron spectra transmission through various shields, problems from bremsstrahlung radiation and cascades initiated in the human body by high-energy particles.

Further information may be obtained from the Program Committee Vice Chairman, E. Vallario, U. S. Atomic Energy Commission, Division of Operation Safety, Washington, D.C. 20545.

PERSONAL ITEMS

R. G. Alsmiller, Charles E. Clifford and Robert W. Peelle have been appointed associate directors of the Neutron Physics Division at Oak Ridge National Laboratory. All three men have been members of that division for the past several years.

* * * * *

We note with regret the recent death of Roland Perret, Head of the Scientific Division, European Nuclear Energy Agency, Paris, France. It has been announced that Johnny Rosén, director of the ENEA Computer Programme Library (ENEA-CPL), is Acting Head of the ENEA Scientific Division. Reginald Prescott is now Acting Head of ENEA-CPL.

* * * * *

Charles M. Huddleston, Technical Manager of the shielding research program for the Office of Civil Defense, returns this month to the Naval Radiological Defense Laboratory after a stay at the University of Illinois.

* * * * *

William R. Kimel, formerly at Kansas State University, is now Dean of the College of Engineering at the University of Missouri, Columbia.

* * * * *

W. H. Steigelman, formerly with NUS, is now manager of Nuclear Systems Laboratory, Franklin Institute, Philadelphia.

* * * * *

David Spielberg is now at Columbia University after many years at United Nuclear Corporation.

J. Robert Beyster and Charles A. Stevens have left Gulf General Atomic and are doing consulting work. Their address is P. O. Box 2351, La Jolla, California 92037.

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VISITORS TO RSIC

Visitors to RSIC during the month of May are: Benjamin A. Batson, Jr., Knoxville, Tenn.; J. R. Beyster, La Jolla, Calif.; Philip Bland, Advanced Reactor Division, Westinghouse Electric Corp., Madison, Pa.; Col. G. C. Reinhardt and Major Richard W. Enz, DASA, Washington, D.C.; R. Nim Evatt, BRDO, General Electric Co., Sunnyvale, Calif.; F. R. Mynatt, Computing Technology Center, Union Carbide Corp., Oak Ridge, Tenn.; R. E. Maerker, Neutron Physics Division, and M.L.Winton, Nuclear Safety Information Center, Oak Ridge National Laboratory, Oak Ridge, Tenn.; Francis J. Patti, Burns and Roe, Inc., Hempstead, N. Y.; and the Panel on Information Analysis Centers, Committee on Scientific and Technical Information, Federal Council for Science and Technology, Washington, D.C.

JUNE ACCESSION LIST OF LITERATURE

The RSIC is now aware of the literature cited in the following list. This literature has either been obtained by RSIC or has been placed on order. When received, this material will be examined and assigned to various files if suitable for our information system. The accession list is divided into three fields (1) reactor and weapons shielding, (2) space and accelerator shielding, and (3) shielding computer codes. These titles are announced before processing and indexing so that there will be no delay and can serve as a prompt announcement of current literature.

RSIC is not a documentation center. Copies of the literature cited must generally be obtained from the author or from a documentation center such as the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia 22151.

RSIC maintains a microfiche file of literature entered into its information system. Computer searches of this system (which produces a special bibliography) and duplicate microfiche copies of the literature in our file are available upon request. Naturally, we cannot supply copies of literature which is copyrighted (such as books or journal articles) or whose distribution is restricted. Neither service is yet available for the codes literature.

REACTOR AND WEAPONS SHIELDING

AFWL-TR-67-72

November 1967

Experimental Verification of Neutron Transport Calculations in
Lithium Hydride
A. E. Profio, R. J. Cerbone, D. L. Huffman

AI-AEC-12774

March 15, 1969

Calculation of Reaction Rates in Small Physical Regions by Means of a
New Non-Multigroup Adjoint Monte Carlo Technique.
L. B. Levitt, R. C. Lewis, et al.

BNL-13157 (CONF-681032-3)

1968

Dosimetry of Cf-252
R. G. Fairchild
Available: AEC Depository Libraries; CFSTI

BNL-13251

1968

Nuclear and Physical Properties of Cf-252
A. Prince

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February 1969

Fission Product Inventory and Decay Heat Associated with FTR Fuel
W. L. Bunch, L. D. O'Dell
Available: AEC Depository Libraries; CFSTI

BNWL-SA-1794

April 29, 1968

Implication of Recent Fission Averaged Cross Section Measurements
W. N. McElroy
Available: AEC Depository Libraries; CFSTI

CEA-R-3626 (In French)

October 1968

Experimental Study of the Rapsodie Protections
M. Chapelet, J. C. Edelin, G. Lhiaubet

CEA-R-3655 (In French)

December 1968

Mass Attenuation and Mass Energy Absorption Coefficients for 10 keV
to 10 MeV Photons
Henri Joffre, Lucien Pages
Available: AEC Depository Libraries

CEA-R-3697 (In French)

December 1968

Thermal Neutron Flux Measurements Using Neutron-Electron Convertors
R. Le Meur, P. Lecomte

- CONF-660920 (Vol. 2) 1968
Radiation Protection. Part 2.
W. S. Snyder, H. H. Abee, L. K. Burton, R. Maushart, A. Benco,
F. Duhamel, B. M. Wheatley (eds.)
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New York, Pergamon Press, Inc.
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Structures
J. S. Cheka
Available: CFSTI
- DP-MS-68-60 July 23, 1968
Catalogue of Gamma Rays Emitted by Radionuclides
M. A. Wakat
- EGG-1182-2165 (Rev.) October 1968
Nuclear Accident Dosimetry: Depth-Dose Considerations
K. C. Humpherys, J. A. Sayeg
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- EURFNR-591 June 1968
High Resolution Total Neutron Cross Sections Between 0.5 to 30 MeV.
S. Cierjacks, P. Forti, D. Kopsch, L. Kropp, J. Nebe
- FOA-4-4237 (In Swedish) April 1962
Fission Spectra: A Literature Search
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- GA-9221 1968
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Available: AEC Depository Libraries; CFSTI
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A Universal Monte Carlo Method for Solution of Electron Transport
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- JINR-P2-4313 (In Russian) (ORNL Machine Translation 272) 1969
Inelastic Interactions of High Energy pi-Mesons with Photoemulsion
V. S. Barashenkov, K. K. Guidma, V. D. Toneev

- MLM-1400 March 21, 1968
Radiation Emitted by U-233, U-232 Mixtures
M. R. Hertz
- NP-17727 1968
Direct Determination of Transmission and Reflection Matrices for
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- NP-17788 1968
Dose Rates of Neutrons and Gamma Rays Near the Biological Shield
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Z. Makra, M. Tot
- ORNL-4358 March 1969
Strontium-90 Data Sheets
S. J. Rimshaw, E. E. Ketchen
Available: AEC Depository Libraries; CFSTI
- ORNL-TM-2499 April 22, 1969
Some Calculated Milestone Solutions to Time-Dependent Radiation
Transport Problems
E. A. Straker, W. W. Engle, Jr., P. N. Stevens
- ORNL-TM-2520 March 7, 1969
An Examination of Several Computational Models for Use in Computing
Gamma-Ray Penetration of Structures
H. Yamakoshi
- RT/FI(68)32 (N69-19922) 1968
Effective Solutions to the Problems of Neutron Transport Kinetics
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J. Mika, R. Stankiewicz, T. Trombetti
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- UCRL-18801 March 6, 1969
Evaluation of Scattered Dose Rate by Single Compton Scattering
D. L. Rising
- USNRDL-TRC-68-53 (NRSS-Report No. 8) December 1968
Monte Carlo Calculation of Gamma-Ray Penetration of Ribbed Slabs
E. E. Morris
- ATOMKERNENERGIE, 14, 125-8 (Mar.-Apr. 1969) (In German)
Gaps in a Concrete Radiation Shield
H. Lettnin

FAPIG (Tokyo), No. 50, 102-10 (Aug. 1968) (In Japanese)

Shielding Design of the Experimental Fast Reactor
Y. Tanaka; Y. Higashihara

Compt. Rend., Ser. A and B, 267, 461-4 (Aug. 19, 1968) (In French)

Study of the Forward and Backscattered Components of the Secondary
Electron Flux in the Nonequilibrium Zones in the Vicinity of the
Plane Interfaces of Two Different Media Exposed to the γ Rays of Co-60.
M. Bernard, C. Martin, P. N. Martin

J. Appl. Phys., 39, 5342-3 (Oct. 1968)

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T. Tabata

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Spectrum of Relaxation Lengths of Neutron Distribution in a Moderator
I. Kuscer, I. Vidav

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Generating Functions for the Exact Solution of the Transport Equation.
II. Time Dependent with Anisotropic Scattering
I. K. Abu-Shumays, E. H. Bareiss

J. Nucl. Energy, 22, 751-7 (Dec. 1968)

Density Scaling of the Boltzmann Equation and its Application
T. Gozani, C. A. Stevens

J. Nucl. Sci. Technol. (Tokyo), 6(2), 103- (1969)

Dose Buildup Factor of a 60-Co Cylindrical Source with a Shell Shaped
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Y. Kanemori

Nucl. News, 12(2), 36-41 (Feb. 1969)

Nuclear Data Requirements and Acquisition for Shielding Applications
J. R. Beyster, K. J. Yost

Nucl. News, 12, No. 2, 41-6 (Feb. 1969)

Design and Construction of Power Reactor Shields
H. E. Hungerford

Nucl. News 12(2), 51-6 (Feb. 1969).

Transport Solutions to Shielding Problems: Some Recent Developments
C. E. Clifford, F. R. Mynatt, E. A. Straker

Nucl. Phys., A125, 28-32 (1969)

Experimental and Calculated Energy Spectra of Am-Be and Pu-Be Neutron Sources

S. Notarrigo, F. Porto, A. Rubbino, S. Sambataro

Nucl. Sci. Eng., 36(2), 220-231 (May 1969)
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A Semiempirical Formula for Albedo of Alternating Layers

T. Nakamura, T. Hyodo

Rev. Roum. Phys., 13, 661-71 (1968)

A Numerical Integration Method in the P_n Approximation

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Izy. Vyssh. Ucheb. Zaved., Fiz., 10, 86-91 (1968) (In Russian)

Calculation of Higher Order Perturbations in the Transport Theory of Gamma Radiation

V. V. Uchaikin

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Pennsylvania State Univ., (University Park)

On the Stochastic Formulation and Interpretation of Neutron Transport Equations

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SPACE AND ACCELERATOR SHIELDING

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September 1968

Solar Proton Observations at Synchronous Altitude During 1967

G. A. Paulikas, J. B. Blake

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April 1969

Flight Experiment Shielding Study (FESS) Satellite Data Analysis.
Phase II
R. E. Fortney

JINR-P2-4183 (In Russian)

1968

Energy Dependence of the Nuclear Cross Sections for Nucleons at
Energy Above 50 MeV
V. S. Barashenkov, K. K. Guidma, V. D. Toneev

JINR-P2-4333 (In Russian)

1969

Interaction Cross Sections of Nucleons with Helium
V. S. Barashenkov, S. M. Eliseev

JINR-P2-4346 (In Russian)

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Inelastic Interactions of High-Energy Deuterons with Atomic Nuclei
V. S. Barashenkov, K. K. Guidma, V. D. Toneev

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Buildup of the Low-Energy Radiation in the Accelerator Shielding
B. S. Sychev

NASA-CR-99263 (N69-16506)

August 23, 1968

Problems in Radiation Dose Calculations in Spacecraft. Part I:
Electrons
J. S. Ingley

NASA-CR-99198 (N69-15908)

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Cosmic-Ray Negatron and Positron Spectra Between 12 and 220 MeV
K. P. Beuerman

ORNL-TM-1866

March 4, 1969

Modification and Further Development of the Nucleon Transport Code,
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Calculation of the Radiation Hazard at Supersonic Aircraft Altitudes
Produced by an Energetic Solar Flare
T. W. Armstrong, R. G. Alsmiller, Jr., J. Barish

ORNL-TM-2560

April 1, 1969

The Transport of Neutrons Produced by 3-GeV Proton-Lead Nucleus
Collisions Through a Labyrinth and Comparison with Experiment
R. G. Alsmiller, Jr., E. Solomito

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The Van Allen Radiation Belts
P. Touzain
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The Calculation of the Inelastic Interaction of Cosmic Nuclei
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Statistical Calculations of Inelastic Collisions of Fast Particles
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- ORNL-2126 (IKF-20 in German) December 1968
A Universal Monte Carlo Method for the Solution of Electron Transport
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Siegmar Wittig
- RPP/R5 August 27, 1968
Evaluation of Dose Equivalent from Neutron Energy Spectra
K. B. Shaw, G. R. Stevenson, R. H. Thomas
- UCRL-17941 September 1968
1966 CERN-RL-LRL-RHEL Shielding Experiment at the CERN Proton
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W. S. Gilbert, D. Keefe, J. B. McCaslin, H. W. Patterson, A. R.
Smith, L. D. Stephens, K. B. Shaw, G. R. Stevenson, R. H. Thomas,
R. D. Fortune, K. Goebel
Availability: Lawrence Radiation Laboratory, University of California,
Berkeley
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An Estimate of the Prompt Photon Spectrum Arising from Cosmic-Ray
Bombardment of the Moon
T. W. Armstrong, R. G. Alsmiller, Jr.
- Astronomical Society of Australia, Proceedings, 1, 148-149 (Dec. 1968)
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Time Structure of Solar Flare Proton Events
B. J. Stone
(Conference on Solar System Plasmas and X-Ray Astronomy, University
of Adelaide, Adelaide, Australia, Aug. 12-14, 1968)
- J. Geophys. Research, 74, 1254-69 (Mar. 1, 1969) (A69-21709)
Energetic Electrons at Latitudes Above the Outer-Zone Cutoff
A. L. Vampola

Nucl. Sci. Eng., 36(2), 251-255 (May 1969)
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High-Energy (<400 MeV) Neutron Transport Using the Method of Discrete Ordinates

R. G. Alsmiller, Jr., F. R. Mynatt, J. Barish, W. W. Engle, Jr.

Nucl. Sci. Eng., 36(3), 291-294 (June 1969)
(Announced previously as ORNL-TM-2462)

Calculation of the Neutron and Proton Spectra from Thick Targets Bombarded by 450-MeV Protons and Comparison with Experiment

R. G. Alsmiller, Jr., J. W. Wachter, H. S. Moran

Solar Physics, 6, 216-227 (Feb. 1969) (A69-22172)

High-Energy Proton, Helium, and Gamma-Ray Observations on OSO-III
M. F. Kaplon

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| IN-SSL-N-68-13 | September 1968 | EDNA |
| Electron Transport from a Cosine Law Source
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| Riso-M-812 | October 1968 | EXPOSUM |
| Description of AEK Programme No. 513, EXPOSUM
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by Walter E. Ford, III, and David H. Wallace
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- AMSAA Tech. Report No. 11 February 1969 MAGIC-SAM C
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FORTRAN for BRLESC and CDC 6600
- AMSAA Tech. Report No. 13 February 1969 MAGIC-SAM C
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Operation of SAM C and its Peripheral Programs
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- AMSAA Tech. Report No. 14 April 1969 MAGIC-SAM C
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- DASA 2263 February 1969 ANTE
ANTE - A Fortran Computer Code for the Solution of the Adjoint
Neutron Transport Equation by the Monte Carlo Technique
by M. O. Cohen
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- AFRRI CR67-2, RRA-T72 February 1967 COHORT
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FORTRAN IV for IBM 7090

BNWL-236, Sup 2

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A Revised Photon Probability Library for Use with ISOSHLD-III
by C. A. Mansius

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by L. D. O'Dell and W. L. Bunch

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PULANT

The Diffusion of Fast Neutrons Through Cylindrical Ducts
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