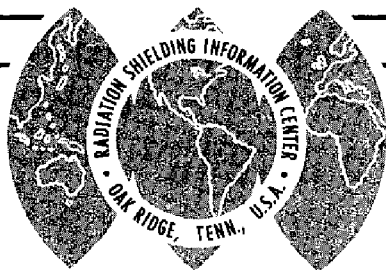


RSIC Newsletter



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. 76

March 1971

ON WRITING

*It is not of so much consequence what you say,
as how you say it.*

*Memorable sentences are memorable
on account of some single irradiating word.*

-- Alexander Smith
(1863)

A BUSY YEAR FOR RSIC

Currently, 1153 people receive the RSIC Newsletter, each of whom may also be on one or more categories of the RSIC distribution. Approximately 250 people have furnished an individual profile for routine selective dissemination of shielding information (SDI). In addition, the RSIC staff members processed 79 separate requests for literature searches during the past calendar year.

There were 604 bibliographic entries to the storage and retrieval system - 255 in reactor and weapons shielding categories, 193 in space and accelerator shielding categories, and 156 in codes literature.

A brief summary of the operations of the Radiation Shielding Information Center for the 12 months of 1970 follows:

Progress - Improvements made to the computer code collection:

- 44 computer codes were packaged.
- 25 code packages in the collection were updated, several of which included major modifications and extensions to the program.
- 11 new hardware versions of existing code packages were fed back into RSIC by installations where conversions were made.
- 5 additional data library sets were collected and packaged, including documentation.
- 3 updates to existing data packages were made.

Services to the shielding community:

2149 letters of request were logged into the Center - approximately 179/month, resulting in 5476 actions required to satisfy the requests.

1343 of the above letters were specifically concerned with information about and requests for data or code packages.

806 letters requested general shielding information.

An analysis of the activities required to satisfy the requests from the shielding community follows:

Those connected with the codes collection:

- 573 separate code packages were shipped, including full documentation.
- 74 shipments were made of updating material only.
- 12 instances in which only the source program was sent as a computer listing.
- 151 instances where input-output of sample problems were mailed. (In some cases these were special problems run by the RSIC staff members to satisfy a customer request.)
- 202 instances in which staff members spent considerable time in trouble-shooting specific codes as a requester was learning how to use a code, including advice concerning his input preparation.
- 542 instances in which assistance was given in the selection of the computer code to fit the requester's problem, his computer, and his capabilities.
- 64 abstracts of shielding code packages were sent.

Those connected with data handling activities:

- 185 separate data packages were shipped, including documentation.
- 131 separate data handling activities involving the use of the computer were carried out in connection with the National Neutron Cross Section Center and the Cross Section Evaluation Working Group shielding subcommittee and with the ORNL cross section steering committee.

Other activities:

- 900 RSIC publications were furnished to requesters.
- 1245 additional shielding documents (841 of which were code documents) were mailed to requesters.
- 86 packets of RSIC introductory literature were mailed to possible new subscribers.
- 499 instances were logged in which time was spent in assisting the requester to solve his problem - general advice and counsel.
- 702 separate miscellaneous requests were filled.

One hundred ten visitors were welcomed to the Radiation Shielding Information Center, excluding those attending seminar-workshops sponsored by RSIC. Twenty of these visitors were from foreign countries.

One seminar-workshop was sponsored by RSIC in 1970 - on the Monte Carlo calculational method and selected computer codes.

PROCEEDINGS OF THE MONTE CARLO SEMINAR-WORKSHOP ISSUED

The Proceedings of the seminar-workshop held in Oak Ridge on October 1970 has been issued. It is entitled "A Review of the Monte Carlo Method for Radiation Transport Calculations (Collected Papers of a Seminar, October 5, 1970,)" ORNL-RSIC-29 (February 1971), compiled by Betty F. Maskewitz and Vivian Z. Jacobs. It is available from RSIC upon request. It may also be requested from NTIS.

CDC 6600 VERSION OF MORSE AVAILABLE

Sandia Laboratories, Albuquerque, New Mexico, have taken the current version of MORSE and made it compatible with the CDC 6600 computer. It is now packaged in RSIC as CCC-127C/MORSE. Requesters should send a reel of magnetic tape, indicating how it should be written, along with the request for this code version.

CORRECTIONS TO CCC-127

The ORNL Neutron Physics Division has called to RSIC's attention a correction to CCC-127B/MORSE.

Subroutine RELCOL, which estimates to all groups, should have a card (RELC 520) removed: IF (BC(IARG+IGØ).LT.-32.0) GØ TØ 35

This correction has been reflected in the RSIC package and has been mailed to those known to be using this version of MORSE.

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For those who may plan to use the general geometry package in the MORSE code package: It has been noted that subroutines JOM 13, JOM 14, and JOM 15 are missing from the general geometry package. These sub-routines may be obtained upon request from RSIC.

FEBRUARY 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 National Technical Information Service, Springfield, Va. 22151.

REACTOR AND WEAPONS SHIELDING

AEEW-M-970

October 1970

A Low Gamma-Sensitivity Boron Proportional Counter
F. H. Allen
Atomic Energy Establishment, Winfrith, England.

AERE-PR HPM-14

June 1970

Health Physics and Medical Division Progress Report, January -
December 1969
J. E. Johnston (ed.)
Avail.: NTIS

AERE-R-5069

October 1966

Radiation Dose Rates from Plutonium Oxide-Beryllium Oxide Mixtures
J. A. Douglas, J. R. McLaren, F. P. J. Robotham
Avail.: Dep.; NTIS (U.S. Sales only)

AERE-R-6500

September 1970

A Dosimeter to Measure the Skin Dose from Low Energy Beta and Gamma
Radiations
M. Marshall, J. Docherty

BNWL-1309 (N70-39027)

May 1970

Promethium Isotopic Power Data Sheets
J. H. Jarrett, H. H. Van Tuyl
Avail.: NTIS

BNWL-1512

November 1970

Criticality Safety Analysis - Model 60 Shipping Package for FFTF
Driver Fuel Pins
C. L. Brown
Avail.: NTIS

- BRH/ORO 70-2 (PB-193154) June 1970
State Radiation Control Legislation 1969.
B. L. Dillard
Avail.: NTIS
- CEA-N-1354 (In French) October 1970
Study of the Validity of the Sabine Code in Calculations on the
Shielding of Heavy and Light Water Reactors
Jean-Yves Guezenc, Michel Lott, Pierre Pepin
Avail.: Dep.; NTIS (U.S. Sales only)
- CEA-N-1355 (In French) October 1970
Characteristics of Ordinary Concrete Relative to Radioprotection
Calculation
Alain LeDieu de Ville, Pierre Pepin
Avail.: Dep.; NTIS (U.S. Sales only)
- CEA-N-1359 (In French) October 1970
Three-Dimensional Monte Carlo Calculation (TRIPOLI Code) of the
Neutron Spectra in the Lower Shield of PHENIX
Jean-Claude Nimal, Therese Vergnaud
Avail.: Dep.; NTIS (U.S. Sales only)
- CEA-N-1382 (In French) December 1970
Measurement of the Neutron Albedo of Ordinary Concrete
Jacques Brisbois, Laurent Costa, Michel Lott
Avail.: Dep.; NTIS (U.S. Sales only)
- CEA-N-1384 (In French) October 1970
COSANI Program: The Comparison of Several Results from the SABINE
and ANISN Programs
C. Dupont
- CEA-R-4047 (In French) August 1970
Gamma-Ray Production Cross Sections for 5-, 6.6- and 8.7-MeV Neutrons
with Nitrogen, Oxygen, Scandium, and Gold
A. Bertin, F. Bertrons, G. Clayeus
- CERN-DI/HP-29 (CONF-640109-1) January 8, 1964
Approach to a REM Dosimeter Using Ionization Chambers
A. H. Sullivan
Avail.: Dep.; NTIS (U.S. Sales only)
(From Symposium on Neutron Dosimetry for Radiological Purposes, London)

CONF-700101-(Vol. 1)

May 1970

1. Studies of Radioactivity from Nuclear Explosions for Peaceful Purposes
R. A. Siddons pp. 753-74
 2. Preliminary Assessment of the Radiological Implications of Commercial Utilization of Natural Gas from a Nuclearly Stimulated Well
D. G. Jacobs, E. G. Struxness, C. R. Bowman pp. 831-49
 3. Study of Chemical Reactions in the Nuclear Underground Explosion: Incidence on Radioactivity
J. M. Picq pp. 850-58
- Avail.: NTIS
(From Symposium on Engineering with Nuclear Explosives, Las Vegas, Nev., Jan. 14-16, 1970)

COO-2049-2 (CONF-700608-23)

1969

One Dimensional S_n Calculations of Neutron Spectra Reflected from Thick Slabs of Concrete and Iron, Comparison with Measurements
W. Meyer, D. H. Timmons, P. K. Shen
Avail.: Dep.; NTIS

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Annual Scientific Report - 1969
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April 1968

Safety Summary Report: Curium Shipping Cask (Packaging of Radioactive and Fissile Materials)
P. D. Kelsch, C. A. Wilkins
Avail.: NTIS

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December 1969

Neutron Nuclear Data Compilation and Evaluation: Past, Present, and Future
J. J. Schmidt
Avail.: Dep.; NTIS (U.S. Sales only)

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Gamma Radiation Following the Capture of Neutrons, Especially of Polarized Reactor Neutrons by Oriented Nuclei
Klaus Weise (Thesis)
Avail.: Dep.; NTIS (U.S. Sales only)

GA-9919

March 11, 1970

Irradiation-Induced Dimensional Changes and Creep of Isotropic Carbon
J. L. Kaae, J. C. Bokros

- HASL-229 (N70-39162) *May 1970*
The Biological Effects of Tritium
H. Q. Woodard
Avail.: NTIS
- IN-1446 *November 1970*
SCANS: Spectra Calculation from Activated Nuclide Sets
M. H. Putnam, G. E. Putnam
Avail.: Dep.; NTIS
- IN-1448 *December 1970*
Gamma Rays Emitted by the Fissionable Nuclides and Associated Isotopes
J. E. Cline
- INP-709 *1970*
Accuracy of the Neutron Method of Moisture Measurement
E. Sciesinska
Avail.: Dep.; NTIS (U.S. Sales only)
- KFK-1003 (N70-38236) (In German) *August 1969*
Construction and Instrumentation of a Three-Parameter Experiment for
Investigation of the Prompt Gamma Radiation from Fission Fragment of
Specific Mass in a Time Range of 1 nsec after a Neutron-Induced Fission
F. Horsch, I. Piper
Avail.: Dep.
- KFK-1233 (In German) *July 1970*
Messung Von Neutronenspektren Im Energiebereich Von 1 eV BIS 10 keV
Mit Hilfe Der Sandwichtechnik
M. Muller
Avail.: Gesellschaft fur Kernforschung M.B.H. Karlsruhe
- LA-4511 *November 1970*
TEPLO: A Heat Conduction Code for Studying Thermal Explosions in
Laminar Composites
C. A. Anderson
- LA-4539 *November 1970*
ANDYMG3, the Basic Program of a Series of Monte Carlo Programs for
Time-Dependent Transport of Particles and Photons
D. R. Harris
Avail.: NTIS

LA-4543

October 1970

Energy Loss by Nuclear Elastic Scattering
J. J. Devaney, M. L. Stein
Avail.: Dep. NTIS

MDC-G-363

1969

Statistical Analysis of Solar Cosmic Ray Proton Dose
W. R. Yucker

NASA-CR-102888-Vol. 1 (WANL-PR(LL)-022-Vol. 1)

September 30, 1968

Synthesis of Computational Methods for the Design and Analysis of
Radiation Shields and Nuclear Rocket Systems. Volume 1: Radiation
Measurements in a Nuclear Rocket Propellant Tank Mockup Using Simulated
Liquid Hydrogen
H. C. Woodsum, J. Rowland
Avail.: NTIS as N70-43127

NASA-CR-102888-Vol.2 (WANL-PR(LL)-022-Vol. 2)

September 30, 1968

Synthesis of Computational Methods for the Design and Analysis of
Radiation Shields for Nuclear Rocket Systems. Volume 2: Analysis of
Radiation Measurements in a Nuclear Rocket Propellant Tank Mockup Using
Simulated Liquid Hydrogen
L. D. Stephenson, R. G. Soltesz, R. K. Disney, S. L. Zeigler
Avail.: NTIS as N70-43128

NASA-CR-109971 (N70-35168)

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A Model for the Radiations from the Compact Strong Sources
A. Cavaliere, P. Morrison, F. Pacini

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Effect of Reactor Irradiation on Ductile-Brittle Transition and
Stress-Strain Behavior of Tungsten
C. L. Younger, G. N. Wrights
Avail.: NTIS

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September 1970

Measurement of Density of Thin Asphalt Layers by Backscattering of
AM-241 Gamma Radiation
K. Preiss, C. Supe
(Negev Institute for Arid Zone Research, Div. of Eng. Sciences,
Beer-Sheva, Israel)

Negev Institute-Report 108

December 1970

A Gamma Ray Density Probe Designed for Foundation Exploration in
Loess Field Calibration
K. Preiss, A. Lahat

NP-18286

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Radiation Health and Safety. Annual Report for the Year Ended 31st
December 1968

Avail.: NTIS

NP-18433

May 1, 1970

Measurement of the Spectra and Flux of Electrons and Photons at any
Point in an Irradiated System

(Toulouse Univ. (France), Centre de Physique Atomique et Nucleaire)

NP-18514 (In Italian)

1964

X Rays: Protection, Dosimetry, and Precautions

A. Venier

Avail.: Dep.; NTIS (U.S. Sales only)

NSJ-tr-157

Gamma-Ray Leakage Through a Junction Between Lead and Concrete Walls

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(Translated from Nippon Genshiryoku Gakkaishi, 11, 144-9 (Mar. 1969))

NYO-1932(2)-186

July 1970

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Avail.: Dep.; NTIS

ORNL-TM-1312 (Vol. 8)

August 1970

Structural Analysis of Shipping Casks. Vol. 8. Experimental Study
of the Stress-Strain Properties of Lead Under Specified Impact Con-
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Avail.: NTIS

ORNL-TM-2970

May 1970

Calculated Radioactivity of MSRE Fuel Salt

M. J. Bell

Avail.: NTIS

ORNL-TM-2971

December 1970

Design and Safety Considerations of Shipping Solidified High-Level
Radioactive Wastes

J. J. Perona, R. S. Dillon, J. O. Blomeke

Avail.: Dep.; NTIS

ORNL-TM-3209

January 1971

A Glove Box Vacuum System for Radioisotopic Targets
J. R. Gibson

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September 30, 1970

Density Determinations Using a Gamma Radiation Attenuation Technique.
Fourth Annual Progress Report
I. G. Dillon

SCL-DR-70-108

December 1970

SPECTR - A Finite Difference Computer Program for Calculating the
Dynamic Response of a Cylindrical Shell
M. R. Birnbaum, F. L. Cupps et al

SRARI-P-78 (In Russian)

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Effect of Irradiation on the Mechanical Properties of fcc Alloys of
the Fe-Cr-Ni System. Part I
V. D. Balashov, S. N. Votinov, V. I. Prokhorov
Avail.: Dep.; NTIS (U.S. Sales only)

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Avail.: Dep.; NTIS (U.S. Sales only)

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(In several languages)

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D. C. Barg
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C. L. Hanson, M. S. Coops, E. D. Arnold

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July 1970

Some New Thermal-Neutron Capture-Gamma Yields for the WANL Point Library
S. A. Fody
Avail.: Dep.; NTIS

WAPD-TM-971

December 1970

An Evaluation of the Radiative Neutron Capture Cross Sections of
Thorium-232 for the Range 0.0 eV to 15 MeV (LWBR Development Program)
N. M. Steen
Avail.: NTIS

WHAN-FR-30

October 1970

Irradiation-Induced Creep in Austenitic Stainless Steel
E. R. Gilbert, L. D. Blackburn

Y-1754

December 18, 1970

X-Ray and Nuclear Radiation Facilities, Personnel Safety Features
W. J. Mason, E. W. Pipes, et al

Acta Radiol. - Ther. Phys. Biol. 9, 555- (1970)

Kilovoltage Calibration of Diagnostic Roentgen Ray Generators
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Can. J. Soil, 50(3), 439- (1970)

Soil Water Content from Gamma-Ray Attenuation - A Comparison of Ioniza-
tion Chamber and Scintillation Detectors
G. C. Topp

J. Math. Anal. Appl., 32(3), 651- (1971)

Approximate Solutions to Nonlinear Integral Equations
J. O. Mingle

Nucl. Eng. Design, 14(2), 319-331 (Dec. 1970)

Neutron Energy-Dependent Damage Function for Analysis of Austenitic
Steel Creep Data
W. N. McElroy, R. E. Dahl, Jr., E. R. Gilbert

Nucl. Technology, 10(2), 204-210 (February 1971)

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Assembly Using Californium-252
F. E. Senftle, A. G. Evans, D. Duffey, P. F. Wiggins

Phys. Rev. C, 2, 2323- (1970)

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E. T. Jurney, R. K. Sheline, E. B. Shera, H. R. Koch, B. P. K. Maier,
U. Gruber, H. Baader, D. Breitig, O. W. B. Schult, J. Kern

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Importance of Pulse-Height Analysis in Gamma-Ray Attenuation Technique
for Measurement of Soil Moisture
G. S. Saxena, R. E. Franklin, G. S. Taylor

Tr. Soyuznogo Nauch-Issled. Inst. Priborostr., No. 10, 3-11 (1969)
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Determination of the Efficiency of Registration of Gamma-Radiation
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NP-18338

June 1970

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(Regulations for the Safe Transport of Radioactive Materials,
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1968

Program of Dose Calculation
J. Brettes, J. P. Philippon
(From Calculation of Radiation Doses in Space Conference, Toulouse,
France)

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A Method for Estimating Particle Fluxes Affecting a Satellite in
Space
G. Quaranta

CONF-680219, pp. 187-94 (In French)

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Considerations Relative to the Calculation of Radiation Doses in
View of the Quantification of Biological Effects in the Case of
Supersonic Transport
L. Miro, A. Pfister, G. Deltour, R. Kaiser

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L. I. Dorman, et al
Avail.: NTIS
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K. O'Brien
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W. R. Yucker
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Long-Range Solar Flare Prediction, Final Report, June 1968 - August
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- NASA-CR-107565 (NAMI-1091, N70-15208) *October 1969*
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H. J. Schaefer, J. J. Sullivan
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National Bureau of Standards, Washington, D. C.
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M. O. Burrell, J. W. Watts, Jr.
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Avail.: NTIS

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- NASA-TM-X-53915 (MSFC-SSL-P-68-12, N70-37584) September 1969
A Brief Discussion of Berger's Latest Monte Carlo Program
J. H. Derrickson
Avail.: NTIS
- NASA-TM-X-53921 (N70-37510) September 16, 1969
A Method for Simulating Van Allen Belt Proton Energy Spectra
J. W. Watts, Jr., M. O. Burrell
- NASA-TM-X-64438 (N70-35864) February 15, 1965
Prediction of Solar Proton Doses in the Apollo Command Module and LEM
T. M. Vinson, Lopez
Avail.: NTIS
- NASA-TM-X-64439 (N70-35806) June 21, 1967
Bremsstrahlung Dose Calculations for Apollo Manned Spacecraft
J. W. Snyder, C. S. Portwood, III, D. A. Witt, T. T. White, A. C. Hardy
Avail.: NTIS
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J. J. Lambiotte, Jr. J. W. Wilson, T. Foelsche, T. A. Filippas
Avail.: NTIS
- ORNL-TM-3132 December 7, 1970
Phenomenologically Determined Isobar Angular Distributions for Nucleon-Nucleon and Pion-Nucleon Reactions Below 3 GeV
H. W. Bertini, M. P. Guthrie, A. R. Culkowski
- Astron. Raumfahrt*, 2; 58-61 (1969) (In German)
Exposure to Radiation in Orbital Flights
H. Swart
- Environmental Space Sciences*, 3(3), 179-184 (May-June, 1969)
Some Results of Measuring Neutron Fluxes in the Artificial Earth Satellite "COSMOS-53"
B. P. Bulatov, V. E. Koridalin, V. M. Petrov
Translated from *Kos. Biol. Med.*, 3(3), 16-24 (May-June 1969 (in Russian))

Health Physics, 18, 711-20 (June 1970)

Free-Nucleon Target Model Applied to Penetration and Dose Calculations
for 200 and 400 MeV Protons and Neutrons

H. A. Wright, J. E. Turner

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A. F. Akkerman, I. M. Beskrovnyi, Yu. M. Nikitushev

J. Atmos. Terrest. Phys., 32, 1015-45 (June 1970)

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M. J. Berger, S. M. Seltzer, K. Maeda

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Solar Flare Radiation Protection Requirements for Passive and Active
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F. W. French

Nucl. Instrum. Methods, 82, 289-80 (1970)
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T. W. Armstrong, R. G. Alsmiller, Jr.

Nucl. Instr. Methods, 89, 53-59 (1970)
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R. G. Alsmiller, Jr. F. R. Mynatt, M. L. Gritzner, J. V. Pace, J.
Barish

Nucl. Sci. Eng., 41(3), 449-451 (Sept. 1970)
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Evaluation of High-Energy (400 MeV) Space-Proton-Induced Secondaries in
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S. B. Curtis, M. C. Wilkinson

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T. W. Armstrong, K. C. Chandler

Trans. Amer. Nucl. Soc.; 13(1), 412 (June-July, 1970)

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Neutrons and Protons
R. G. Alsmiller, Jr., T. W. Armstrong, W. A. Coleman

THESIS No. 258 (OLS 115/70)

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Jean-Pierre Philippon (University of Toulouse, France)

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by B. Liley and S. C. Hamilton, Space Division, North American Rockwell
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AFWL-TR-69-161

January 1970

AM MAN

Computerized Anatomical Man
by Paul G. Kase, Martin Marietta Corporation, Denver, Colorado
Model is compatible with MEVDP, FORTRAN IV, CDC 6600

BNL-50246 (T-580)

June 1970

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Manual
by Jacob Gilat, Brookhaven National Laboratory
FORTRAN IV, CDC 6600

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GRACE

GRACE: A Multigroup Fast Neutron Spectrum Code
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