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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05R SEMINAR HELD AT OAK RIDGE

A group of 80 people representing 45 organizations attended the 05R Monte Carlo System Seminar at the Oak Ridge National Laboratory held July 26-28. Several participants from France and Germany attended. Staff members of the Neutron Physics Division, assisted by members of the staff of the ORNL Mathematics Division and Central Data Processing Facility (UCNC), presented eight formal talks and led the participants through several typical problems in the workshop. The code is available to any requestor through RSIC.

CODE COMPATIBILITY STUDY

A committee within the ANS - M and C Division has undertaken a study on code compatibility and standardization in connection with next-generation computers. It is hoped that recommendations on the setting of desirable standards may come out of the study. Suggestions from interested members of the shielding community would be welcomed by RSIC staffer, Mrs. Betty F. Maskewitz, who is a member of the study committee. Chairman Margaret Butler of Argonne suggested that the name of the group be STICE, pronounced "Sticky," for Study In Cooperative Effort.

ADDITION TO CODE PACKAGE CCC-13/ADONIS

Leonard B. Gardner and Alan J. Mettler of the U.S. Naval Civil Engineering Laboratory, Port Hueneme, California have written a generalized computer code for ADONIS geometry, described in USNCEL Technical Report R-379. UNIGEOM incorporates a modified version of United Nuclear's EASYGEOM as the main routine and their TESTG as a subroutine. It was written for a two legged duct and three-legged coplanar and non-coplanar ducts. Physical characteristics of the geometry are input. The output will yield punched cards ready for an ADONIS run.

The new routines, all in FORTRAN, have been placed in the RSIC IBM-7090 code package.

CCC-36/EMPIRE-II MODIFICATION

EMPIRE-II is a multigroup discrete ordinate neutron transport code for slab geometries. It was written for the Philco-2000 predominantly in Fortran language and placed for distribution by Westinghouse, Bettis Atomic Power Laboratory. The RSIC staff has made the code operable on the IBM-7090.

The code was modified as follows: (1) eliminated three library subroutines, LØADER, FLEXØ, and LABLE, not available on the IBM library; (2) eliminated TAC language from the source program; (3) converted the code from a 7-Segment job to a 7-Link chain job; and (4) made a special expanded IØU Table.

The sample problem has been processed through all 7 links. Running time was approximately 12 minutes. The code is now available as an all-Fortran version.

RECENT VISITORS TO RSIC

The following people visited RSIC during the month of July: Henry B. Piper and Charles H. Gabbard, Reactor Division, Oak Ridge National Laboratory; Major Glenn G. Sherwood, ARPA, The Pentagon, Washington; Prof. Sakae Shimizu, Institute of Chemical Research, Kyoto University, Yoshida, Kyoto, Japan; Glenn Mooney and Wade Selph, Radiation Research Associates, Fort Worth, Texas; LeRoy G. Haggmark, USNRDL, San Francisco, California; Prof. N. Umakantha, Karnotok University, Dharwar, Mysore, India; Jack E. Olhoeft, Westinghouse Electric Corp, Atomic Power Detp., Pittsburgh; and J. Arnold Soltz, CEIR, Arlington, Va.

JULY ACCESSION LIST OF LITERATURE

The following accession list consists of literature which the RSIC obtained through its usual scanning procedures. This literature will be examined for assignment to various files or for possible rejection. The accession list is divided into three fields of (1) reactor and weapons shielding, (2) space and accelerator shielding, and (3) shielding computer codes.

Reactor and Weapons Shielding

PSDC-tr-15

The Barrier Attenuation Introduced by a Vertical Wall
C. McDonnell, J. V. Velletri, A. W. Starbird and J. F. Batter
September 1, 1964

FOA 4 RAPPORT A4402-454

Gamma Dose Rates from Ground and Steel Activation Following Nuclear Fission Explosions in Air
A. Bergstrom and M. Leimdorfer - November 1964

RPI-328-7

Geometrical Transport Effects in the Spherical Harmonics Approximation
T. E. Dudley and P. B. Daitch - June 1964

AED-C-01-08

Selected Literature According to Subject. Building Materials Radiation Shielding. Part III. Shielding of Gamma and Neutron Radiations, Theory and Experiment
1964

AEEW-M-443

Shielding Research in the U.K. A Summary of the History and Current Programme of the U.K.A.E.A. Shielding Group with an Indication of Future Trends
J. Butler - March 1964

AEEW-M-453

A Method for Comparison of Experimental and Theoretical Differential Neutron Spectra in the Zenith Reactor
D. L. Reed and C. R. Symons - 1965

AEEW-R-403

Effective Cadmium Cut-Off Energies in Cyclindrical Geometry for Fissile and $\frac{1}{v}$ Detectors
E. J. Maunders - 1964

AEEW-R-408

Measurement and Assessment of Radiation Doses from the Handling of Reactor Fuel
T. F. Johns - 1964

RISO-97

On the Theory of the Neutronic Method for Measuring the Water Content in Soil
P. L. Olgaard - January 1965

Space and Accelerator Shielding

N64-26407 (NASA-RP-279)

On the Zenithal Distribution of Extremely-High-Energy Cosmic-Ray Muons in the Atmosphere
J. Geophys. Res. 69(9), 1725-36 (May 1, 1964)

N64-26079 (NASA-RP-260)

Very High-Energy Cosmic Rays
C. E. Fichtel

N65-17626 (NASA-CR-60808)

Research Regarding Guidance and Space Flight Theory Relative to the Rendezvous Problem, Technical Summary Report, Feb. 21, 1962 - Sept. 22, 1964

BOOK

Biological Effects of Neutron and Proton Irradiations, Vol. I and II.
IAEA Vienna
International Publishers, Inc., New York

N65-21804 (JPRS-29656)

Radiation Barrier and Man in Space
Uy. Volynkin, P. Saksonov and N. Dobrov

N65-21150

Thresholds of Nuclear Reactions
R. J. Howerton, Donald Braff, et al.
1964

N65-21247 (AEET/ANAL/32)

A Chart of Gamma Energies vs. Half-Life for Nuclides Produced by (n,γ) and (X-X') Reactions
S. Gangadharan, R. Krishnamoorthy Iyer - 1964

N65-21375 (Rept.-537/VI)

A Comparison of Angular Distribution of Secondary Particles in Ultra-High Energy Jets with the Quasi-Rectangular Distribution Predicted by the Modified Statistical Model
J. Babecki and M. Miesowicz - July 1964

N65-21377 (CERN-64-13, Vol. IV)

Proceedings of the 1964 Easter School for Physicists Using the CERN Proton Synchrotron and Synchro-Cyclotron, Vol. IV
E.H.S. Burhop, J. C. Combe, et al.
May 1964

N65-21844 (Rept.-552/VI)

Relativistic Kinematics of New Models of Multiple Meson Production and Some Related Topics
G. Coghen - August 1964

N65-21920 (Rept.-551/VI)

On the Existence of Events with Large Energy Transfer into Neutral Pions in the Investigation of Nuclear Interactions at Mountain Altitudes
Z. Buja, B. Heller, et al.
November 1964

N65-21300 (NASA-CR-57992)

Study of the Application of Perceptrons for Prediction of Solar Flares. Solar Flare Forecasting with a Recognizing Automation - Final Report, Phase II
C. M. Theiss and A. E. Murray - February 1965

N65-21671 (NASA-TM-X-55211)

The Origin of Solar Flares and the Acceleration of Charged Particles
D. G. Wentzel

N65-21847

Basic Research and National Goals
Lawrence R. Blinks - March 1965

N65-21313 (NASA-CR-57909)

Approximation of Expectation Values
J. O. Hirschfelder and W. A. Sanders - March 10, 1965

N65-21849 (Rept.-368)

Molecular Dynamics Investigated by Neutron Scattering
J. A. Janik - November 1964

N65-22193 (NASA-TM-X-51736)

Semiclassical Calculation of Inelastic Cross Sections for Electron-Cesium Atomic Collisions
J. W. Sheldon and J. V. Dugan, Jr. - April 17, 1964

N65-21453 (GRD-110)

Inelastic Atomic Collisions in Plasmas
S. N. Milford - 1963

Shielding Computer Codes

AEG-KERNENERGIEANLAGEN-BERICHT NR. 116
ORNL-tr-610 — MAC-RAD

A Multigroup Attenuation Code for Plane Geometry
by H. Preusch and H. Ilsemann
FORTRAN for IBM-7090 computer

NAA-SR-8884 — June 1965 — CURIE, DØSE, THUNDERHEAD

A Digital Computer Program for External and Internal Radiation Dose Calculations
by G. P. Kenfield, W. R. Lahs, W. B. Sayer, R. M. MacAdams, and N. A. Harris
FORTRAN for 7094 computer

SM-43594 — April 1963 — LIPRECAN I

A Monte Carlo Program for Two Dimensional Neutron Penetration and Energy Deposition In Liquid Hydrogen
by R. H. Karcher
FORTRAN for IBM-7090 computer

ORNL-3742, Revised — June 1965 — MAX

A Generalized One-Constraint Lagrange Multiplier Numberical Formulation
by F.H.S. Clark and F.B.K. Kam
FORTRAN for CDC-1604 computer

USNCEL-TR-379 June 1965 (UNIGEØM for ADØNIS)

A Monte Carlo Calculation of Neutron Streaming Through Two-Legged-Duct Entranceways
by Leonard B. Gardner and Alan J. Mettler
FORTRAN for IBM-7090 computer

ER-6906 May 1964 FPIC

A Fission Product Inventory Code
by K. O. Koebberling, W. E. Krull, and J. H. Wilson
FORTRAN for IBM-7090/7094 computer

NEW CODES RECEIVED FOR COMPUTER CODE COLLECTION

The following codes have been received since Newsletter No. 6 and are being processed:

P-38 ARIEL
A PROGRAM FOR THE STUDY OF PHOTOPRODUCTION REACTIONS IN HYDROGEN, contributed by Instituto Superiore di Sanita, Physics Laboratories, Rome, Italy.
FORTRAN IV for IBM-7040
(Reference: ISS-64/21 - ORNL-tr-624)

P-39 OGRE SYSTEM
A SERIES OF CODES IN THE OGRE (MONTE-CARLO) SYSTEM: OGRE-G, OGRE-P3, OGRE-P1, HOT ONE, OGREISH, contributed by Oak Ridge National Laboratory, Neutron Physics Division, Oak Ridge, Tennessee.
FORTRAN for IBM-7090 computer
(Reference: to be published)

P-40 SPARES
SPACE RADIATION ENVIRONMENT AND SHIELDING CODES, contributed by Air Force Weapons Laboratory, Biophysics Branch, Alburquerque, New Mexico and the Boeing Company, Aero-Space Division, Seattle, Washington.
FORTRAN for IBM-7090 computer
(Reference: D2-90684-1, WL-TDR-64-71, Vol I, WL-TDR-64-71, Vol II)

P-41 PROTOS
A MONTE CARLO PROCEDURE FOR CALCULATING THE MIGRATION OF PROTONS TAKING ACCOUNT ONLY OF ELECTROMAGNETIC INTERACTIONS, contributed by The Research Institute of National Defense, Stockholm, Sweden.
FORTRAN for IBM-7090 computer
(Reference: A-4411-411)

P-44 FPIC
LOCKHEED FISSION PRODUCT INVENTORY CODE, contributed by Lockheed-Georgia Company, Marietta, Georgia.
FORTRAN for IBM-7090/7094 computer
(Reference: ER-6906)