

Editorial Advisory Committee

MANSON BENEDICT
DEAN BROWN
JACK CHERNICK
E. RICHARD COHEN
E. C. CREUTZ
O. E. DWYER
PAUL GAST
D. H. GURINSKY
A. F. HENRY
D. G. HURST
A. A. JOHNSON
L. W. NORDHEIM
RALPH T. OVERMAN
RONALD S. PAUL
HUGH C. PAXTON
FRED W. THALGOTT
A. M. WEINBERG

ANS Officers

RAEMER E. SCHREIBER,
President
KARL P. COHEN,
Vice President
JOHN W. LANDIS,
Treasurer
OCTAVE J. DU TEMPLE,
Executive Secretary

ANS Publications Staff

JOHN GRAHAM
Senior Staff Editor
RUTH FARMAKES
Assistant Staff Editor
JEFFREY LEONARD
Design and Production Editor
MARY M. GRIFFITH
Art Editor
JEAN BARR
Production Assistant

Composition

BELJAN, ANN ARBOR, MICH.

Nuclear Science and Engineering is published monthly by the American Nuclear Society, Incorporated, with executive and business offices at 244 East Ogden Avenue, Hinsdale, Illinois 60521—telephone 312/325-1991. Subscription rate is \$25/volume: Volumes 31, 32, 33, and 34 will be published during 1968; address subscription orders to the American Nuclear Society (back issues of Volumes 1-17 are available from Academic Press, 111 Fifth Avenue, New York, N.Y.). Second-class postage is paid at Hinsdale, Illinois and at additional mailing offices. Nuclear Science and Engineering is printed in Danville, Illinois. Copyright © 1968 by the American Nuclear Society, Inc.

NUCLEAR SCIENCE and ENGINEERING®

VOL. 31, No. 2 FEBRUARY, 1968

Contents

TECHNICAL PAPERS

- Study of Lithium Mobility in Irradiated Silicon
Walter A. Hackler and Chihiro Kikuchi 175
- Geometry and Barrier Attenuation of Cobalt-60 Gamma Rays by a Vertical Steel Slab
G. E. Plummer 183
- A Study of Fission-Neutron Spectra with High-Energy Activation Detectors. Part II: Fission Spectra
James A. Grundl 191
- The Energy Spectrum of Fast Neutrons Slowing Down from a Fission Source in a Homogeneous Medium
T. E. Murley and I. Kaplan 207
- Cross-Spectral Density Measurements in a Coupled-Core Reactor
Richard A. Hendrickson and Glenn Murphy 215
- Analysis of Pulsed Fast-Neutron Spectra in Multiplying Assemblies
J. D. Jenkins and P. B. Daitch 222
- The Statistical Estimation of Thermal-Neutron Cross Sections
J. L. Cook and A. L. Wall 234
- Measurement of ¹³⁵I Yield Ratios and Fission-Product Cross Sections in the Advanced Reactivity Measurement Facilities
R. G. Nisle and I. E. Stepan 241
- Low-Flux Measurement of ²³⁵U Episcadmium Capture-to-Fission Ratio
W. C. Redman and M. M. Bretscher 247
- Neutron Scattering from Light Water
J. R. Beyster 254
- Energy Optimal Xenon Shutdown
Jeffrey Lewins, Gordon R. Woodcock, Theodore J. Williamson, and Albert L. Babb 272
- Monte Carlo Analysis of Nuclear Reactor Fluctuation Models
Burt A. Zolotar 282
- Monoenergetic Critical Parameters and Decay Constants for Small Homogeneous Spheres and Thin Homogeneous Slabs
I. Carlvik 295
- Numerical Solution of the Time-Dependent Multigroup Diffusion Equations
J. Barclay Andrews, II and K. F. Hansen 304
- Comparison of Neutron-Transport and Diffusion Theories of Isotropic Scattering
P. S. Grover, L. S. Kothari, and A. K. Ghatak 314
- Accuracy of Transport Theory Calculations of an Anisotropic Neutron Flux
Pekka Jauho and Heikki Kalli 318
- A Strategy for the Application of Space-Angle Synthesis to Practical Problems in Neutron Transport
M. Natelson 325

TECHNICAL NOTES

- Effect of Property Variation on the Turbulent Flow of Gases in Tubes: The Thermal Entry
P. M. Magee and D. M. McEligot 337
- Total Cross Sections of Na, K, and Ca for 14-MeV Neutrons
F. Guarrini, A. Luches, G. Pauli, and G. Poiani 341
- Absolute Neutron Yields from Thick Target ^{NATC}(α, n).
R. L. Macklin and J. H. Gibbons 343
- Comparison of Beryllium Photoneutron Decay Sets Using Experimental SNAP Data
Eric H. Ottewitte 343
- Suggested Procedures for Utilizing MUFT Resonance Parameters to Include Doppler Broadening
David T. Goldman 346
- The Application of Synthesis Techniques to the Calculations of Three-Dimensional Reactivity-Coefficient Distributions.
J. L. Bear, F. D. Judge, and E. R. Venerus 349
- Anomalies Arising from the Use of Adjoint Weighting in a Collapsed Group-Space Synthesis Model
J. B. Yasinsky and S. Kaplan 354
- Flux Tilting in a Two-Zone Reactor
D. E. Jeffers and K. Hall 358

BOOK REVIEWS 360

Indexed in "Engineering Index" and Abstracted in "Nuclear Science Abstracts"