

Editorial Advisory Committee

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

ANS Officers

KARL P. COHEN
President
LOUIS H. RODDIS, JR.
Vice President
JAMES R. LILIENTHAL
Treasurer
OCTAVE J. DU TEMPLE
Executive Secretary

ANS Publications Staff

JOHN GRAHAM
Senior Staff Editor
RUTH FARMAKES
Assistant Staff Editor
CHARLES VIANE
Design and Production Editor
JUNE JOHNSON
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. 33, No. 2 AUGUST, 1968

Contents

TECHNICAL PAPERS

- Placzek-Type Oscillations in General Neutron Slowing Down. *M. Segev and S. Yiftah* 147
- P_N Blackness Theory in Plane Geometry.
S. P. Congdon and M. R. Mendelson 151
- Optimal Control of Xenon-Power Spatial Transients
Weston M. Stacey, Jr. 162
- The Extrapolation Distance for a Black or Grey Cylindrical Neutron Absorber by the Spherical Harmonics Method
Bruno Pellaud 169
- Slow Neutron Scattering from Water
R. M. Brugger 187
- Inelastic Thermal-Neutron Scattering by Liquid D_2O
W. L. Whittemore 195
- Thermal-Neutron Diffusion in Light and Heavy Water . . .
P. B. Parks, D. J. Pellarin, N. H. Prochnow, and N. P. Baumann 209
- Measurement of the Decay of Thermal Neutrons in Aqueous Solutions of the Non- $1/v$ Neutron Absorber Cadmium.
L. G. Larsson and E. Möller 218
- Determination of Reactor Kinetic Parameters by Photon Observation
Wayne K. Lehto and John M. Carpenter 225
- Spatially Dependent Resonance Neutron Spectra in a Slab of Depleted Uranium
H. M. Antunez and J. M. Neill 238

TECHNICAL NOTES

- Description of Anisotropic Scattering in the Double P_1 Method by Means of Anisotropy Functions
S. A. W. Gerstl and W. Kofink 249
- A Variational Approach to the Selection of the Direction Sets in the Discrete S_n Approximation to Neutron Transport Theory.
Pekka Jauho and Heikki Kalli 251
- Numerical Solution of the Boltzmann Integral Equation—A Multigroup Benchmark Calculation.
K. D. Lathrop 255
- Application of Variational Synthesis to the Optimal Control of a Point Reactor Model
Weston M. Stacey, Jr. 257
- Analytic Resonance Integral Formulae
N. M. Steen 260
- Time and Space Relaxation Constants of Neutrons in a Proton Gas.
M. M. R. Williams 262
- An Iterative Method for Evaluation of Period Measurements in a Reactor Containing an Intrinsic Neutron Source.
F. W. A. Habermann and H. Walze 264
- Total Neutron Cross Section of Water.
J. M. Neill, J. L. Russell, Jr., and J. R. Brown 265

BOOK REVIEWS. 268

LETTER TO THE EDITOR

- Concerning "An Optimal Control of a Distributed-Parameter Reactor"
S. H. Kyong 270

CORRIGENDUM 270