

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
HUGH C. PAXTON
FRED W. THALGOTT

ANS Officers

N. JOSEPH PALLADINO
President
JOHN W. LANDIS
President-Elect
JAMES R. LILIENTHAL
Treasurer
OCTAVE J. DU TEMPLE
Executive Secretary

ANS Publications Staff

NORMAN H. JACOBSON
Publications Manager
RUTH FARMAKES
Assistant Staff Editor
KATHRYN L. FROELICH
Copy Editor
SIEGFRIED H. KRAPP
Production Manager
LINDA A. DOLBY
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 \$110/4 volumes, calendar year; \$30/single volume: Volumes 43, 44, 45 and 46 will be published during 1971; single copy price is \$13 (special issues slightly higher); 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 © 1971 by the American Nuclear Society, Inc. Inquiries about the distribution and delivery of NUCLEAR SCIENCE AND ENGINEERING and requests for changes of address should be directed to the publisher, the American Nuclear Society, 244 East Ogden Avenue, Hinsdale, Illinois 60521. Allow 6 weeks for a change to become effective.

NUCLEAR SCIENCE and ENGINEERING[®]

VOL. 44 NO. 1 APRIL 1971

Contents

TECHNICAL PAPERS

- A Physical Basis for Two-Phase Pressure Gradient and Critical Flow Calculations *P. E. Tremblay and D. G. Andrews* 1
- Influence of Coated-Particle Structure in Thermal-Neutron-Spectrum Energy Range *U. Hansen and E. Teuchert* 12
- An Analysis of Bare and Reflected Metal Critical Assemblies Using ENDF/B Data *Hans Ludewig* 18
- Solutions of the Diffusion Equation by the Spectral-Synthesis Method. *Paul G. Lorenzini and Alan H. Robinson* 27
- A Simplified, Coarse-Mesh, Three-Dimensional Diffusion Scheme for Calculating the Gross Power Distribution in a Boiling Water Reactor *S. Børresen* 37
- An Altered Diffusion Theory Based on the Double P-0 Approximation for all Geometries *Stefano L. Pavari-Fontana and Harvey Amster* 44
- The Tensor Form of the Neutron-Transport Equation with Application to Finite Differencing *D. W. Drawbaugh* 58
- Reactor Kinetic Parameters of Lattices of Plutonium and Uranium in Water. *V. O. Uotinen, J. H. Lauby, W. P. Stinson, and S. R. Dwivedi* 66
- Improved Spatial Differencing for the Solution of Space-Time Problems Arising from the Movement of Reactor Materials *J. B. Yasinsky and L. R. Foulke* 72
- On the Determination of Stability Domains in Non-linear Point Reactor Dynamics *Richard Ziskind and William E. Kastenberg* 86

TECHNICAL NOTES

- Tests of Evaluated Beryllium ($n, 2n$) Cross Sections by Analysis of 1.4-eV Flux in Water for an Americium-Beryllium Source Enclosed in Beryllium Spheres *Roger L. Alexander, Daniel Fieno, and C. Hubbard Ford* 95
- Pair-Production Cross Sections at 2.75 MeV *H. F. Atwater* 102
- An Approximate High-Energy Alpha-Particle Nucleus Collision Model. *T. A. Gabriel, R. T. Santoro, and R. G. Alsmiller, Jr.* 104
- Subcritical Reactivity from Reactor Noise *Andreas Szeless and Lawrence Ruby* 110
- Comment on Subcritical Reactivity from Reactor Noise *Robert W. Albrecht* 112

COMPUTER CODE ABSTRACTS 113

LETTERS TO THE EDITOR

- Comments on Residual Power Fluxes from Radioactive Surfaces *Robert A. Schlenker* 115
- Reply to Comments on Residual Power Fluxes from Radioactive Surfaces *Jacob B. Romero* 116
- Comments on Certain Instabilities in the "Initial Value" Problem *V. Protopopescu* 116

CORRIGENDUM 117

BOOK REVIEW 118