

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
 DIANNE DORAN
 Copy Editor
 SIEGFRIED H. KRAPP
 Production Manager
 KATHRYN FROELICH
 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 39, 40, 41, and 42 will be published during 1970; 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 © 1970 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.

Contents

TECHNICAL PAPERS

Nonlinear Oscillations and Stability of a Nuclear Reactor With Two Reactivity Feedbacks *Theodore R. Schmidt and David L. Hetrick* 1

Effect of Delayed Neutrons on Autonomous Nonlinear Power Oscillations *Louis M. Shofkin, David L. Hetrick, and Theodore R. Schmidt* 10

A Measurement of the Neutronic Interaction Between Two Cylindrical Moderators *G. Grosshög* 16

An Improved Collision Probability Method for Thermal-Neutron-Flux Calculation in a Cylindrical Reactor Cell *T. Boševski* 23

High Resolution Measurements of the Total Neutron Cross Sections of Nitrogen and Iron *A. D. Carlson and R. J. Cerbone* 28

Calculation of the Radiation Hazard at Supersonic Aircraft Altitudes Produced by an Energetic Solar Flare—II. *T. W. Armstrong and H. S. Moran* 41

Prediction of Residual Fluxes of Heavy Particles Escaping Radioactive Surfaces. *Jacob B. Romero* 49

The Importance of Gravitational Coagulation on the Settling of High-Mass Density Aerosols. *G. C. Lindauer and A. W. Castleman, Jr.* 58

Geometry for Efficient External and Internal Cooling of Cylindrical Heat Sources *G. Melese-d'Hospital* 64

Effects of Cladding Thickness and Thermal Conductivity on Heat Transfer for Laminar In-Line Flow Through Rod Bundles *O. E. Dwyer and H. C. Berry* 69

Laminar-Flow Heat Transfer for In-Line Flow Through Unbaffled Rod Bundles *O. E. Dwyer and H. C. Berry* 81

TECHNICAL NOTES

Optimization of Gas-Cooled Fast Reactor Blankets *C. Maeder* 89

Space Dependence of the Reactor Kinetic Parameter as Measured by the Garelis-Russell Method. *C. Laperches and F. J. Munro* 93

Calculations of Neutron Time-Energy Distributions in Heavy Moderators. *T. J. Williamson and R. W. Albrecht* 97

The Formulation of Continuous Slowing Down Theory for General Processes in Terms of Separable Kernels *Martin Becker and Edward T. Burns* 100

On the Discrete Spectrum of the Transport Operator *Pekka Silvenmoinen and P. F. Zweifel* 103

The Average Angle of Scattering in Energy-Dependent Problems. *Frank McGirt and Martin Becker* 104

The Effect of Plutonium-241 Decay on the Analysis of Plutonium Critical Experiments. *V. O. Uotinen* 107

Effective Atomic Numbers for Gamma-Ray Interactions in Alloys *V. Seshagiri Rao, M. N. Seetharamanath, K. Narasimha Murty, and K. Parthasaradhi* 109

CORRIGENDUM 111

COMPUTER CODE ABSTRACTS 112

BOOK REVIEWS 116

LETTER TO THE EDITOR

Comments on Adjoint Monte Carlo Sampling Techniques. *Leo B. Levitt and Jerome Spanier* 118