

## 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. THALGOT  
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  
RICHARD HARRIS  
Design and Production Editor  
MARY M. GRIFFITH  
Art Editor  
HELEN ANDERSON  
Copy 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 27, 28, 29, and 30 will be published during 1967: 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 © 1967 by the American Nuclear Society, Inc.

# NUCLEAR SCIENCE and ENGINEERING®

VOL. 30,

No. 3

December 1967

## Contents

### TECHNICAL PAPERS

- Thermoelastic Dynamics of a Pulse Reactor . . . . .  
*David Burgreen* 317
- The Use of Infinite Medium Spectra in Gamma-Ray Heating Calculations . . . . .  
*T. E. Dudley, M. R. Mendelson, and N. E. Holden* 328
- Neutron Fluxes in Concrete Ducts Arising from Incident Episcadmium Neutrons: Calculations and Experiments . .  
*R. E. Maerker and F. J. Muckenthaler* 340
- Neutron Total and Absorption Cross Sections of  $^{238}\text{Pu}$  . . .  
*T. E. Young, F. B. Simpson, J. R. Berreth, and M. S. Coops* 355
- Decay of Thermalized Neutron Fields in Graphite . . . . .  
*C. H. Reed, C. N. Henry, and A. A. Usner* 362
- Activation Measurement of the Doppler Effect for  $^{238}\text{U}$  Capture and  $^{235}\text{U}$  Fission in a Fast-Neutron Spectrum . .  
*G. R. Pflasterer, Jr. and R. Sher* 374
- Reactor Analysis by Monte Carlo . . . . .  
*H. Rief and H. Kschwendt* 395
- Application of the Natural Mode Approximation to Space-Time Reactor Problems . . . . .  
*Larry R. Foulke and Elias P. Gyftopoulos* 419
- Sinusoidal Analysis of a Low-Power Nuclear Reactor by the Wentzel-Kramers-Brillouin Approach . . . . .  
*Sevim Tan* 436

### TECHNICAL NOTES

- Variational Functionals for Space-Time Neutronics . . . . .  
*Weston M. Stacey, Jr.* 448
- A Perturbation Method for Analysis of Neutron-Source-Worth Experiments in Nuclear Reactors . . . . .  
*A. Gandini* 451
- Linear Analysis of Xenon Spatial Oscillations . . . . .  
*Weston M. Stacey, Jr.* 453
- Neutron Diffusion Using a Modulated Source . . . . .  
*G. A. Massel and M. R. Feix* 455
- A Very Low-Temperature Nuclear Reactor . . . . .  
*S. A. Dupree* 458
- Total Gamma Energy Release Due to Thermal-Neutron Fission in  $^{235}\text{U}$  . . . . .  
*N. E. Holden, M. R. Mendelson, and T. E. Dudley* 461

BOOK REVIEWS . . . . . 464

VOLUME AUTHOR and SUBJECT INDEXES . . following page 466