Compendium Of Neutron Spectra And Detector Responses For Radiation Protection Purposes Technical Reports No 318

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National Bureau of Standards Handbook
Neutron and X-ray Spectroscopy
NUREG/CR.
The Physics and Astrophysics of Neutron Stars

JADA HEATH

Physics of Nuclear Reactors Springer Science & Business Media
Over fifty years have passed since the

first patient was treated with fast neutrons, but this form of therapy is still a matter of bitter dispute. Neutron generators have been installed in many countries and now patients can be treated with equipment that is technically similar to modern megavoltage x-ray equipment. The Physics and Radiobiology of Fast Neutron Beams presents a full discussion of the physical and radiobiological factors governing the production and use of fast neutron beams for therapy. The book discusses vastly improved neutron generators, advances in the standardization of dosimetric methods, and the specification of radiation quality. In addition, it explores nuclear methods of analysis, particularly neutron activation analysis in vivo. Influencing the place of radiotherapy with neutrons and other heavy particles, the radiobiological factors governing the treatment of cancer with radiation are examined. The author also studies the radiation hazard of neutrons, a matter of importance in the use of neutrons for chemical analysis in vivo. The Physics and Radiobiology of Fast Neutron Beams will be a valuable introduction to the subject for radiotherapists, medical physicists, radiographers, and radiobiologists new to the field. The book is also a useful summary of current knowledge for those already established in the use of fast neutrons for medical purposes.

Artificial Neural Networks Springer Science & Business Media

Neutron stars are the most compact

astronomical objects in the universe which are accessible by direct observation. Studying neutron stars means studying physics in regimes unattainable in any terrestrial laboratory. Understanding their observed complex phenomena requires a wide range of scientific disciplines, including the nuclear and condensed matter physics of very dense matter in neutron star interiors, plasma physics and quantum electrodynamics of magnetospheres, and the relativistic magneto-hydrodynamics of electron-positron pulsar winds interacting with some ambient medium. Not to mention the test bed neutron stars provide for general relativity theories, and their importance as potential sources of gravitational waves. It is this variety of disciplines which, among others, makes neutron star research so fascinating, not only for those who have been working in the field for many years but also for students and young scientists. The aim of this book is to serve as a reference work which not only reviews the progress made since the early days of pulsar astronomy, but especially focuses on questions such as: "What have we learned about the subject and how did we learn it?", "What are the most important open questions in this area?" and "What new tools, telescopes, observations, and calculations are needed to answer these questions?". All authors who have contributed to this book have devoted a significant part of their scientific careers to exploring the nature of neutron stars and

understanding pulsars. Everyone has paid special attention to writing educational comprehensive review articles with the needs of beginners, students and young scientists as potential readers in mind. This book will be a valuable source of information for these groups.

Handbook of Prompt Gamma Activation Analysis Elsevier

Spectroscopy in Biology and Chemistry discusses the use of thermal neutron diffraction and inelastic scattering, and the related techniques of x-ray diffraction, Raman and Rayleigh scattering, in investigating biological macromolecules and chemical systems. The book describes neutron, x-ray and laser spectroscopy; quasielastic scattering in neutron and laser spectroscopy; and interatomic forces, molecular structure and molecular vibrations. The text also discusses the x-ray crystallography of biological molecules; neutron diffraction studies of hydrogen bonding in organic and biochemical systems; and comparative x-ray and neutron diffraction from nerve myelin membranes. Neutron spectroscopy of chain polymers; chemical and biological applications of neutron inelastic scattering; and neutron scattering and optical studies of molecular vibrations are also considered. The book further tackles small angle neutron scattering from polymers; the use of tunable laser resonance Raman spectroscopy in biology; and the use photon correlation spectroscopy in biology. Students and faculty members

in physics, chemistry, and biology, and research workers in related fields will find the text invaluable.
Morgan & Claypool Publishers
This book is based upon a series of lectures I have occasionally given at the University of Gottingen since 1951. They were meant to introduce the students of experimental physics to the work in a neutron physics laboratory dealing with the problem of measuring neutron flux, diffusion length, Fermi age, effective neutron temperature, absorption cross sections and similar problems. Moreover, these lectures were intended to prepare the students for a subsequent lecture covering the physics of nuclear reactors. The original character of this series of lectures has been retained in the book. It is intended for use by students as well as anyone desiring to work on neutron physics measurements. The first half mainly covers the theory of neutron fields, i. e. essentially diffusion and slowing down theory. The second half is largely concerned with measurements in neutron fields. The appendix contains information and data which, in our experience, are frequently required in a neutron laboratory. The field of nuclear physics proper is briefly touched upon in the first two chapters, but only to the extent necessary for the understanding of the following chapters. The multitude of applications of neutron radiation has not been covered. The conclusion of this manuscript coincided with the end of my long period of activity with the Max-Planck-Institut fur Physik at Gottingen. To Professor HEISENBERG lowe thanks

for his advice and suggestions for many of the subjects treated here.

Dynamics of Soft Matter Springer Science & Business Media

At the time of its establishment in 1966, by the International Council of Scientific Unions (ICSU), the Committee on Data for Science and Technol ogy (CODATA) was given the basic mission of promoting and encouraging, on a worldwide basis, the production and distribution of compendia and of collections of critically selected numerical data on substances other forms of interest and importance to science and technology. To accomplish this aim, the following tasks were assigned to CODATA: (1) To ascertain, on a worldwide basis, what work on compilation of numerical data is being carried on in each country and under each union, and from this information, to prepare and distribute a Directory or Com pendium of the Data-Compiling Projects and Related Publications of the World; (2) To achieve coordination of existing programs and to recommend new programs; (3) To encourage, from all appropriate sources, financial support for work on compilation; (4) To encourage the use of internationally approved symbols, units, constants, terminology, and nomenclature; (5) To encourage and coordinate research on new methods for preparing and disseminating data for science and technology. In its first two years of operation, 1966 to 1968, in Washington, D. c. , U. S. A. , CODATA fortunately had as its Director Dr. GUY WADDINGTON,

who was also Director of the Office of Critical Tables of the National Research Council (NRC), U. S. A. Dr. *Compendium of Neutron Spectra in Criticality Accident Dosimetry* Elsevier Nuclear Science and Technology, Volume 2: Neutron Physics provides information pertinent to neutron and reactor physics. This book presents a discussion of the general area of energy sources, surveying the fusion problem. Organized into 16 chapters, this volume starts with an overview of the broad range of other research related to nuclear technology, radiation effects, solid state work, chemistry, and materials research. This book then examines the experimental data for the cross sections and fission parameters of the fissile nuclides. Other chapters outline the role of fast choppers in time-of-flight spectrometers and consider the total cross section measurements. This book discusses as well the various experiments performed to test the operation of the system. The final chapter deals with the long-range prospects of fusion power. This book is a valuable resource for graduate students, physicists, nuclear engineers, researchers, scientists involved in fusion research will find this book extremely useful.

Reactor Dosimetry State of the Art 2008 Springer Science & Business Media This publication is an update of Technical Report Series No. 318, Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes (1990), that takes into account the major changes in the

recommended energy dependence of risk related quantities, the increased importance of high neutron energies, the increased use of boron neutron capture therapy, promising new developments in detector design, new measured workplace spectra and improved calibration facilities. It includes the fluence to dose equivalent conversion coefficients for the recently recommended radiation protection quantities and a large number of fluence response functions for recently developed or improved detectors, as well as over 200 new spectra.

Geophysical Well Logging Elsevier

This book highlights the advanced technologies and applications of neutron activation analysis (NAA). It discusses the latest developments influencing the performance and utility of different NAA techniques across wide areas of applications: nuclear technology, industry, medicine, clinical investigations, biology, geochemistry, soil contamination, waste management, diet, lifestyle and health, cosmology, archeology, forensic science, etc. The overall goal of the book is to promote innovation and development of NAA techniques, technologies, and nuclear culture by presenting high-quality chapters with numerous results at both national and international levels. The book will serve as a source for graduate and postgraduate students in nuclear sciences and applications and nuclear analytical techniques, experienced practitioners who want to implement or use other varieties of NAA, professional

technicians and analysts, users of NAA, and other stakeholders who wish to better understand NAA techniques.

Artificial Neural Networks CRC Press

This publication is an update of Technical Report Series No. 318, Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes (1990), that takes into account the major changes in the recommended energy dependence of risk related quantities, the increased importance of high neutron energies, the increased use of boron neutron capture therapy, promising new developments in detector design, new measured workplace spectra and improved calibration facilities. It includes the fluence to dose equivalent conversion coefficients for the recently recommended radiation protection quantities and a large number of fluence response functions for recently developed or improved detectors, as well as over 200 new spectra.

Rare-Earth Borides BoD – Books on Demand

This book summarizes the recent progress in the physics and astrophysics of neutron stars and, most importantly, it identifies and develops effective strategies to explore, both theoretically and observationally, the many remaining open questions in the field. Because of its significance in the solution of many fundamental questions in nuclear physics, astrophysics and gravitational physics, the study of neutron stars has seen enormous progress over the last years and has been very successful in

improving our understanding in these fascinating compact objects. The book addresses a wide spectrum of readers, from students to senior researchers. Thirteen chapters written by internationally renowned experts offer a thorough overview of the various facets of this interdisciplinary science, from neutron star formation in supernovae, pulsars, equations of state super dense matter, gravitational wave emission, to alternative theories of gravity. The book was initiated by the European Cooperation in Science and Technology (COST) Action MP1304 “Exploring fundamental physics with compact stars” (NewCompStar).

Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes

Bernan Press(PA)

Charged-Particle Reaction List 1948-1971 is a guide to experiments on charged-particle-induced reactions that have been reported in journal literature during the period 1948 to June 1971. This compendium consists of the material from four Reaction Lists which have already appeared in Nuclear Data Tables. Each published article is listed under the target nuclei in the nuclear reactions which it treats. Reactions are denoted by A(a,b)B, where A and B are the target and residual nucleus, respectively; a is the bombarding charged particle and b is the outgoing product particle or particles. The guide also includes a brief information after the reaction designation, namely, the energy E of the bombarding projectile in

MeV, a short statement of the type of data that is found in the paper, and a bibliographic information on the paper itself. A symbol THY in the extreme right-hand column denotes the theoretical papers concerned with analysis of nuclear reaction data. For papers dealing with experimental data on energy spectra, the angle of observation of the emerging reaction products, the accelerator, as well as the detector used are given for many entries under the column heading "Quantity Measured." The guide will prove immensely useful for theoretical physicists, nuclear physicists, and molecular physicists. Compendium of neutron spectra in critically accident dosimetry Elsevier The Atlas of Neutron Resonances provides detailed information on neutron resonances, thermal neutron cross sections, and average resonance properties which are important to neutron physicist, astrophysicists, solid state physicists, reactor engineers, scientists involved in activation analysis, and evaluators of neutron cross sections. · Compilation and evaluation of the world's thermal neutron cross-sections and resonance parameters for neutron physicists, reactor engineers, and neutron evaluators. · Compilation and evaluation of coherent scattering lengths for solid state physicists and evaluators · Compilation and evaluation of average 30-keV capture cross sections for astrophysicists. · Nuclear level density parameters derived from average spacings of neutron resonances following a new approach (new feature

for this edition). · Brief review of sub-threshold fission. · Comparisons of optical model predictions with neutron strength function data and scattering lengths. · Estimation of average E1 radiative widths on the basis of the generalized Landau-Fermi liquid model (a new feature for this edition).

Neutron Imaging Springer Science & Business Media

The idea of simulating the brain was the goal of many pioneering works in Artificial Intelligence. The brain has been seen as a neural network, or a set of nodes, or neurons, connected by communication lines. Currently, there has been increasing interest in the use of neural network models. This book contains chapters on basic concepts of artificial neural networks, recent connectionist architectures and several successful applications in various fields of knowledge, from assisted speech therapy to remote sensing of hydrological parameters, from fabric defect classification to application in civil engineering. This is a current book on Artificial Neural Networks and Applications, bringing recent advances in the area to the reader interested in this always-evolving machine learning technique.

Nuclear Spectroscopy CRC Press

The need has arisen for a comprehensive handbook for engineers faced with problems of radiation shielding design. Although there are several excellent books on shielding, they either do not give enough consideration to the many practical

design problems, or are limited to special aspects of the subject. Recognizing the universal need, the International Atomic Energy Agency decided to sponsor the publication ofthe present Engineering Compendium on Radiation Shield ing. At the first editorial discussions it was agreed that, if such a book were to be undertaken, it would be appropriate not only to create a useful design tool for the practising engineer but also to include well-referenced basic data for the research worker. Although trying to keep the book down to a reasonable size, the editors have aimed at a complete presentation of the subject, covering and linking both the tech nology and the science of shielding. Efforts to make terms and definitions consistent throughout have been only partially successful, owing to the continuing development of new ideas. However, inconsisten cies that could not be eliminated are identified whenever possible.

Advanced Technologies and Applications of Neutron Activation Analysis BoD – Books on Demand

- Up-to-date account of the principles and practice of inelastic and spectroscopic methods available at neutron and synchrotron sources - Multi-technique approach set around a central theme, rather than a monograph on one technique - Emphasis on the complementarity of neutron spectroscopy and X-ray spectroscopy which are usually treated in separate books

Compendium of neutron spectra in

critical accident dosimetry Compendium of Neutron Spectra and Detector Responses for Radiation Protection PurposesThis publication is an update of Technical Report Series No. 318, Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes (1990), that takes into account the major changes in the recommended energy dependence of risk related quantities, the increased importance of high neutron energies, the increased use of boron neutron capture therapy, promising new developments in detector design, new measured workplace spectra and improved calibration facilities. It includes the fluence to dose equivalent conversion coefficients for the recently recommended radiation protection quantities and a large number of fluence response functions for recently developed or improved detectors, as well as over 200 new spectra.Compendium of Neutron Spectra and Detector Responses for Radiation Protection PurposesThis publication is an update of Technical Report Series No. 318, Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes (1990), that takes into account the major changes in the recommended energy dependence of risk related quantities, the increased importance of high neutron energies, the increased use of boron neutron capture therapy, promising new developments in detector design, new measured workplace spectra and improved calibration facilities. It includes the

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Compendium of Neutron Spectra and Detector Responses for Radiation Protection Purposes

Engineering Compendium on Radiation Shielding CRC Press

Written by an author who is widely recognized as one of the specialists of the techniques for the investigation of molecular motions in solids, the subject is given a thorough theoretical treatment and is illustrated with numerous examples of recent experimental applications.

Neutron Physics CRC Press

X-Ray and Neutron Diffraction describes the developments of the X-ray and the various research done in neutron diffraction. Part I of the book concerns the principles and applications of the X-ray and neutrons through their origins from classical crystallography. The book explains the use of diffraction methods to show the highly regular arrangement of atoms that forms a continuous pattern in three-dimensional space. The text evaluates the limitations and benefits of using the different types of radiation sources, whether these are X-rays,

neutrons, or electrons. Part II is a collection of reprints discussing the development of techniques that includes a modification of the Bragg method, which is a method of X-ray crystal analysis. One paper presents an improved numerical method of two-dimensional Fourier synthesis for crystals. This method uses a greatly reduced process of arrangement of sets of figures found in the two-dimensional Fourier series. The book also notes the theoretical considerations and the practical details, and then addresses precautions against possible inclusions of errors in this method. The text deals as well with the magnetic scattering of neutrons, and one paper presents a simple method of gathering information about the magnetic moment of the neutron besides the traditional Stern-Gerlach method. Nuclear scientists and physicists, atomic researchers, and nuclear engineers will greatly appreciate the book.

Spectroscopy in Biology and Chemistry Academic Press

Ultra-Cold Neutrons is a complete, self-contained introduction and review of the field of ultra-cold neutron (UCN) physics. Over the last two decades, developments in UCN technology include the storage of UCN in material and magnetic bottles for time periods limited only by the beta decay rate of the free neutron. This capability has opened up the possibility of a wide range of applications in the fields of both fundamental and condensed state physics. The book explores some of

these applications, such as the search for the electric dipole moment of the neutron that constitutes the most sensitive test of time reversal invariance yet devised. The book is suitable as an introduction to the field for research students, as a useful compendium of results and techniques for researchers, and is of general interest to nonspecialists in other areas of physics such as neutron, atomic, and fundamental physics and neutron scattering.

The Physics and Radiobiology of Fast Neutron Beams Springer

Rare-earth borides have attracted continuous interest for more than half a century both from the point of view of fundamental condensed matter physics and for practical applications in various fields of engineering. They demonstrate a wealth of unusual electronic and magnetic properties that have been closely investigated in recent decades using advanced spectroscopies and state-of-the-art physical characterization methods. Authored by leading experts in the field, this book features a comprehensive collection of reviews offering a cutting-edge summary of the research on rare-earth borides from various viewpoints. It includes chapters on the growth and characterization of single-crystal and thin-film samples, detailed description of their lattice structure and dynamics, electronic and magnetic properties in the bulk and at the surface, low-temperature ordering phenomena, and theoretical and experimental description of the unusual

spectroscopic properties from the perspective of modern x-ray and neutron scattering, Raman spectroscopy, and electron spin resonance. The book will appeal to anyone interested in the physics and chemistry of solids and low-temperature physics, especially to researchers and postgraduate students who study magnetic and electronic properties of rare-earth compounds.

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