

1. Record Nr.	UNINA990008961670403321
Titolo	Far Eastern economic review
Pubbl/distr/stampa	Hong Kong, : Review Publishing Company Limited
ISSN	0014-7591
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Periodico
2. Record Nr.	UNINA9911018788103321
Autore	Turner James E
Titolo	Statistical methods in radiation physics // James E. Turner, Darryl J. Downing and James S. Bogard
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Verlag, c2012
ISBN	9786613904614 9783527646548 352764654X 9781283592161 1283592169 9783527646579 3527646574 9783527646562 3527646566
Descrizione fisica	1 online resource (468 p.)
Altri autori (Persone)	DowningD. J BogardJames S
Disciplina	539.2015195 610.153
Soggetti	Ionizing radiation - Statistical methods Radiation - Statistical methods
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.

Nota di bibliografia

Includes bibliographical references and index.

Nota di contenuto

Statistical Methods in Radiation Physics; Contents; Preface; 1 The Statistical Nature of Radiation, Emission, and Interaction; 1.1 Introduction and Scope; 1.2 Classical and Modern Physics - Determinism and Probabilities; 1.3 Semiclassical Atomic Theory; 1.4 Quantum Mechanics and the Uncertainty Principle; 1.5 Quantum Mechanics and Radioactive Decay; Problems; 2 Radioactive Decay; 2.1 Scope of Chapter; 2.2 Radioactive Disintegration - Exponential Decay; 2.3 Activity and Number of Atoms; 2.4 Survival and Decay Probabilities of Atoms; 2.5 Number of Disintegrations - The Binomial Distribution 2.6 CritiqueProblems; 3 Sample Space, Events, and Probability; 3.1 Sample Space; 3.2 Events; 3.3 Random Variables; 3.4 Probability of an Event; 3.5 Conditional and Independent Events; Problems; 4 Probability Distributions and Transformations; 4.1 Probability Distributions; 4.2 Expected Value; 4.3 Variance; 4.4 Joint Distributions; 4.5 Covariance; 4.6 Chebyshev's Inequality; 4.7 Transformations of Random Variables; 4.8 Bayes' Theorem; Problems; 5 Discrete Distributions; 5.1 Introduction; 5.2 Discrete Uniform Distribution; 5.3 Bernoulli Distribution; 5.4 Binomial Distribution 5.5 Poisson Distribution5.6 Hypergeometric Distribution; 5.7 Geometric Distribution; 5.8 Negative Binomial Distribution; Problems; 6 Continuous Distributions; 6.1 Introduction; 6.2 Continuous Uniform Distribution; 6.3 Normal Distribution; 6.4 Central Limit Theorem; 6.5 Normal Approximation to the Binomial Distribution; 6.6 Gamma Distribution; 6.7 Exponential Distribution; 6.8 Chi-Square Distribution; 6.9 Student's t-Distribution; 6.10 F Distribution; 6.11 Lognormal Distribution; 6.12 Beta Distribution; Problems; 7 Parameter and Interval Estimation; 7.1 Introduction 7.2 Random and Systematic Errors7.3 Terminology and Notation; 7.4 Estimator Properties; 7.5 Interval Estimation of Parameters; 7.5.1 Interval Estimation for Population Mean; 7.5.2 Interval Estimation for the Proportion of Population; 7.5.3 Estimated Error; 7.5.4 Interval Estimation for Poisson Rate Parameter; 7.6 Parameter Differences for Two Populations; 7.6.1 Difference in Means; 7.6.1.1 Case 1: 2x and 2x Known; 7.6.1.2 Case 2: 2x and 2y Unknown, but Equal (=2); 7.6.1.3 Case 3: 2x and 2y Unknown and Unequal; 7.6.2 Difference in Proportions; 7.7 Interval Estimation for a Variance 7.8 Estimating the Ratio of Two Variances7.9 Maximum Likelihood Estimation; 7.10 Method of Moments; Problems; 8 Propagation of Error; 8.1 Introduction; 8.2 Error Propagation; 8.3 Error Propagation Formulas; 8.3.1 Sums and Differences; 8.3.2 Products and Powers; 8.3.3 Exponentials; 8.3.4 Variance of the Mean; 8.4 A Comparison of Linear and Exact Treatments; 8.5 Delta Theorem; Problems; 9 Measuring Radioactivity; 9.1 Introduction; 9.2 Normal Approximation to the Poisson Distribution; 9.3 Assessment of Sample Activity by Counting; 9.4 Assessment of Uncertainty in Activity 9.5 Optimum Partitioning of Counting Times

Sommario/riassunto

This statistics textbook, with particular emphasis on radiation protection and dosimetry, deals with statistical solutions to problems inherent in health physics measurements and decision making. The authors begin with a description of our current understanding of the statistical nature of physical processes at the atomic level, including radioactive decay and interactions of radiation with matter. Examples are taken from problems encountered in health physics, and the material is presented such that health physicists and most other nuclear professionals will more readily understand the app