1. Record Nr. UNINA9910784847303321 Autore Ahmed Syed Naeem <1965-> Titolo Physics and engineering of radiation detection [[electronic resource] /] / Syed Naeem Ahmed San Diego;; London,: Academic Press, 2007 Pubbl/distr/stampa **ISBN** 1-281-27265-5 9786611272654 0-08-056964-1 Edizione [1st ed.] Descrizione fisica 1 online resource (789 p.) Disciplina 539.77 Soggetti Radiation - Measurement - Instruments Physical instruments Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Front Cover; Physics and Engineering of Radiation Detection; Copyright Page; Contents; Preface; Chapter 1 Properties and Sources of Radiation; 1.1 Types of Radiation; 1.2 Waves or Particles?; 1.3 Radioactivity and Radioactive Decay; 1.3.A: Decay Energy or Q-Value; 1.3.B: The Decay Equation; 1.3.C: Composite Radionuclides; 1.3.D: Radioactive Chain; 1.3.E: Decay Equilibrium; 1.3.F: Branching Ratio; 1.3.G: Units of Radioactivity; 1.4 Activation; 1.5 Sources of Radiation; 1.5.A: Natural Sources; 1.5.B: Man-Made Sources; 1.6 General Properties and Sources of Particles and Waves; 1.6.A: Photons 1.6.B: Electrons 1.6.C: Positrons; 1.6.D: Protons; 1.6.E: Neutrons; 1.6.F: Alpha Particles; 1.6.G: Fission Fragments; 1.6.H: Muons, Neutrinos and other Particles; Chapter 2 Interaction of Radiation with Matter; 2.1 Some Basic Concepts and Terminologies; 2.1.A: Inverse Square Law; 2.1.B: Cross Section; 2.1.C: Mean Free Path; 2.1.D: Radiation Length; 2.1.E: Conservation Laws; 2.2 Types of Particle Interactions; 2.2.A: Elastic Scattering; 2.2.B: Inelastic Scattering; 2.2.C: Annihilation; 2.2.D: Bremsstrahlung; 2.2.E: Cherenkov Radiation; 2.3 Interaction of Photons with Matter 2.3.A: Interaction Mechanisms 2.3.B: Passage of Photons through Matter; 2.4 Interaction of Heavy Charged Particles with Matter; 2.4.A:

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Sommario/riassunto

This book presents an overview of the physics of radiation detection and its applications. It covers the origins and properties of different kinds of ionizing radiation, their detection and measurement, and the procedures used to protect people and the environment from their potentially harmful effects. It details the experimental techniques and instrumentation used in different detection systems in a very practical way without sacrificing the physics content. It provides useful formulae and explains methodologies to solve problems related to radiation measurements. With abundance of worked-ou