



Physics and Engineering of Radiation Detection

By Syed Naeem Ahmed

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Physics and Engineering of Radiation Detection 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-out examples and end-of-chapter problems, this book enables the reader to understand the underlying physical principles and their applications. Detailed discussions on different detection media, such as gases, liquids, liquefied gases, semiconductors, and scintillators make this book an excellent source of information for students as well as professionals working in related fields. Chapters on statistics, data analysis techniques, software for data analysis, and data acquisition systems provide the reader with necessary skills to design and build practical systems and perform data analysis.

- Covers the modern techniques involved in detection and measurement of radiation and the underlying physical principles
- Illustrates theoretical and practical details with an abundance of practical, worked-out examples
- Provides practice problems at the end of each chapter

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Editorial Review

Review

"Ahmed's book offers the most thorough treatment of the field that this reviewer has encountered so far. After the principles of physics are introduced in the first chapters, all detector technologies relevant for physics, nuclear engineering, and health physics are treated in detail. The author's extensive experience with large- and small-scale detector experiments is apparent. Adding to the book's thoroughness are chapters on radiation dosimetry and protection as well as one on data acquisition systems, which includes all modern standards used in the field. Worked examples are interspersed liberally throughout and, together with the chapter problems, make this a good teaching resource. Extensive bibliographics at chapter ends will satisfy researcher who need to delve deeper into certain subjects. Clearly written and starting at a level accessible also to undergraduates, this book is for all reader levels in physics and engineering." **SUMMING UP:** Recommended. Lower-division undergraduates through professionals; two-year technical program students. -- U. Greife, Colorado School of Mines, CHOICE, October 2007

About the Author

Dr. Ahmed has several years of extensive practical experience in the field of radiation detection and measurement. He holds degrees of Masters in Physics, Masters in Nuclear Engineering, and PhD in Physics. He has heavily contributed to research and development in some of the world renowned Physics laboratories, such as Max-Planck-Institute for Physics in Germany, Fermi National Accelerator Laboratory in USA, and Sudbury Neutrino Observatory in Canada. Particle/radiation detection and measurement are his primary areas of expertise. Currently he is working at Laurentian University/Penguin ASI Inc. as a Senior Research Scientist. Apart from research and development, Dr. Ahmed also teaches in the Physics department of Laurentian University.

Dr. Ahmed is a Chartered Scientist and a Chartered Physicist of the Institute of Physics, UK. He holds memberships of the Institute of Physics, UK, the Canadian Association of Physicists, and the Institute of Particle Physics, Canada.

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