Introduction to experimental particle physics

Contributions to the field of experimental particle physics have been accumulating in the literature over the past 40 years and now compose a vast but scattered array of reports and monographs. This book ties together the most important experimental topics into a brief but balanced overview.

The author first gives a review of particle physics and discusses electromagnetic and nuclear interactions. He then goes on to discuss three nearly universal aspects of particle physics experiments: beams, targets, and fast electronics. The second part of the book treats in detail the properties of various types of particle detectors, such as scintillation counters, Cerenkov counters, proportional chambers, drift chambers, sampling calorimeters, and specialized detectors. Wherever possible the author attempts to enumerate the advantages and disadvantages of each detector, and to specify the factors that limit a detector's performance. Finally, the author discusses aspects of specific particle physics experiments, such as properties of triggers, types of measurements, spectrometers, and the integration of detectors into a coherent system.

Throughout the book, the author has attempted to begin each chapter with a discussion of the basic principles involved and follow it by selective examples. Although it is not meant to be a complete survey of experimental particle physics, nevertheless, this book contains much practical information to provide readers with sufficient background in the subject. It will be a useful reference for particle physicists, nuclear physicists, and graduate students studying these topics.

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