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| Autore | Hanagaki Kazunori |
| Titolo | Experimental Techniques in Modern High-Energy Physics [[electronic resource]] : A Beginner's Guide // by Kazunori Hanagaki, Junichi Tanaka, Makoto Tomoto, Yuji Yamazaki |
| Pubbl/distr/stampa | Tokyo : , : Springer Japan : , : Imprint : Springer, , 2022 |
| ISBN | 4-431-56931-6 |
| Edizione | [1st ed. 2022.] |
| Descrizione fisica | 1 online resource (155 pages) |
| Collana | Lecture Notes in Physics, , 1616-6361 ; ; 1001 |
| Altri autori (Persone) | TanakaJunichi TomotoMakoto YamazakiYuji |
| Disciplina | 539.7 |
| Soggetti | Nuclear physics System theory Mathematical physics Nuclear and Particle Physics Complex Systems Theoretical, Mathematical and Computational Physics |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Nota di contenuto | Introduction -- Basic Idea of Measurements in Particle Collisions -- Apparatus -- Statistics -- Detector Calibration -- Particle Identification -- Event Simulation -- Examples of Physics Analysis. |
| Sommario/riassunto | This open access book offers a concise overview of how data from large scale experiments are analyzed and how technological tools are used in practice, as in the search for new elementary particles. It focuses on interconnects between physics and detector technology in experimental particle physics, and includes descriptions of mathematical approaches. Readers find all the important steps in analysis, including reconstruction of the momentum and energy of particles from detector information, particle identification, and also the general concept of simulating particle production from collisions and detector responses. As the scale of scientific experiments becomes larger and data-intensive science emerges, the techniques used in the data analysis become ever more complicated, making it difficult for beginners to |

grasp the overall picture. The book provides an explanation of the idea and concepts behind the methods, helping readers understand journal articles on high energy physics. This book is engaging as it does not overemphasize mathematical formalism and it gives a lively example of how such methods have been applied to the Higgs particle discovery in the Large Hadron Collider (LHC) experiments, which led to Englert and Higgs being awarded the Nobel Prize in Physics for 2013. Graduate students and young researchers can easily obtain the required knowledge on how to start data analyses from these notes, without having to spend time in consulting many experts or digesting huge amounts of literature.
