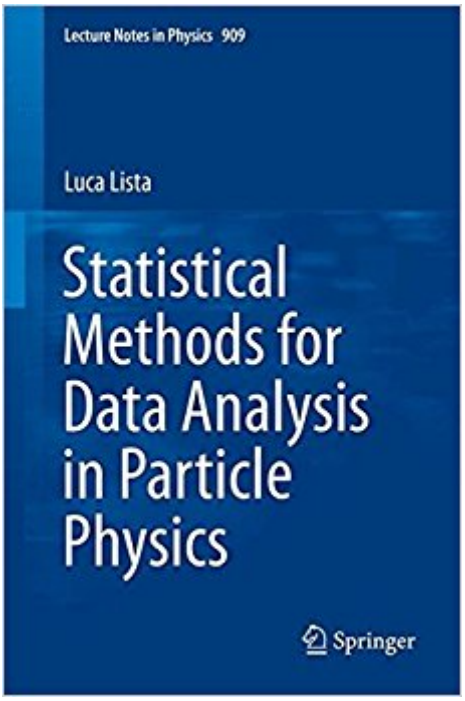
Statistical Methods For Data Analysis In Particle Physics (Lecture Notes In Physics)



Synopsis

This concise set of course-based notes provides the reader with the main concepts and tools to perform statistical analysis of experimental data, in particular in the field of high-energy physics (HEP). First, an introduction to probability theory and basic statistics is given, mainly as reminder from advanced undergraduate studies, yet also in view to clearly distinguish the Frequentist versus Bayesian approaches and interpretations in subsequent applications. More advanced concepts and applications are gradually introduced, culminating in the chapter on upper limits as many applications in HEP concern hypothesis testing, where often the main goal is to provide better and better limits so as to be able to distinguish eventually between competing hypotheses or to rule out some of them altogether. Many worked examples will help newcomers to the field and graduate students to understand the pitfalls in applying theoretical concepts to actual data.

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Customer Reviews

Ã¢â ¬Å“This book is an excellent introduction to statistical methods for data analysis in general, not only in particle physics. Ã¢â ¬Â¦ The contents are well structured, concise and easily understandable. Particular effort was made in illustrating distinct characters of frequency and Bayesian approaches. Ã¢â ¬Â¦ I highly recommend this book to anyone who is interested in pursuing data analysis in all fields.Ã¢â ¬Â• (Zhen Mei, zbMATH 1333.81007, 2016)

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This is a very short but interesting book about statistical methods in physics, particularly in high energy physics.The book is present with a modern perspective; explain a little bit some very recent techniques and discussions about statistical techniques especially in the field of estimating interval coverage.In my opinion the principal problem of the book is the size, I think the book is too short and some of the discussion should need more expansions and more working examples. For example, the discussion of the Feldman-Cousins criteria regarding interval coverage in asymmetrical PDF, needs more examples and explanations. In the same way the last chapter needs more detailed explanations.I understand that more explanations mean more space and transform the lecture notes in a more rigorous book, but I think this worth to.For these reason I recommend this book but as a second lecture, after studying for example the Glen CowanÃƒÂ¢Ã â ¬Ã â„¢s book.On the other hand the book has a lot of typographical errors that must be corrected in future reprints or editions

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