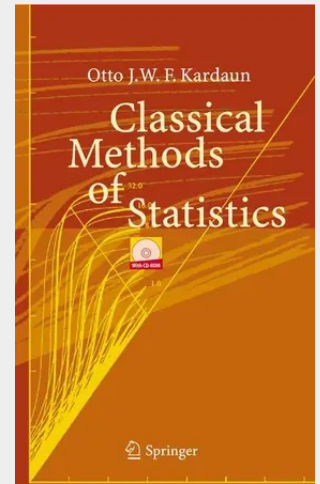


Classical Methods of Statistics

with Applications in Fusion-Oriented Plasma Physics

Classical Methods of Statistics is a guidebook combining theory and practical methods. It is especially conceived for graduate students and scientists who are interested in the applications of statistical methods to plasma physics. Thus it provides also concise information on experimental aspects of fusion-oriented plasma physics. In view of the first three basic chapters it can be fruitfully used by students majoring in probability theory and statistics. The first part deals with the mathematical foundation and framework of the subject. Some attention is given to the historical background. Exercises are added to help readers understand the underlying concepts. In the second part, two major case studies are presented which exemplify the areas of discriminant analysis and multivariate profile analysis, respectively. To introduce these case studies, an outline is provided of the context of magnetic plasma fusion research. In the third part an overview is given of statistical software; separate attention is devoted to SAS and S-PLUS. The final chapter presents several datasets and gives a description of their physical setting. Most of these datasets were assembled at the ASDEX Upgrade Tokamak. All of them are accompanied by exercises in form of guided (minor) case studies. The book concludes with translations of key concepts into several languages.

Classical Methods of Statistics is a blend of theory and practical statistical methods written for graduate students and researchers interested in applications to plasma physics and its experimental aspects. It can also fruitfully be used by students majoring in probability theory and statistics. In the first part, the mathematical framework and some of the history of the subject are described. Many exercises help readers to understand the underlying concepts. In the second part, two case studies are presented exemplifying discriminant analysis and multivariate profile analysis. The introductions of these case studies outline contextual magnetic plasma fusion research. In the third part, an overview of statistical software is given and, in particular, SAS and S-PLUS are discussed. In the last chapter, several datasets with guided exercises, predominantly from the ASDEX Upgrade tokamak, are included and their physical background is concisely described. The book concludes with a list of essential keyword translations.



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