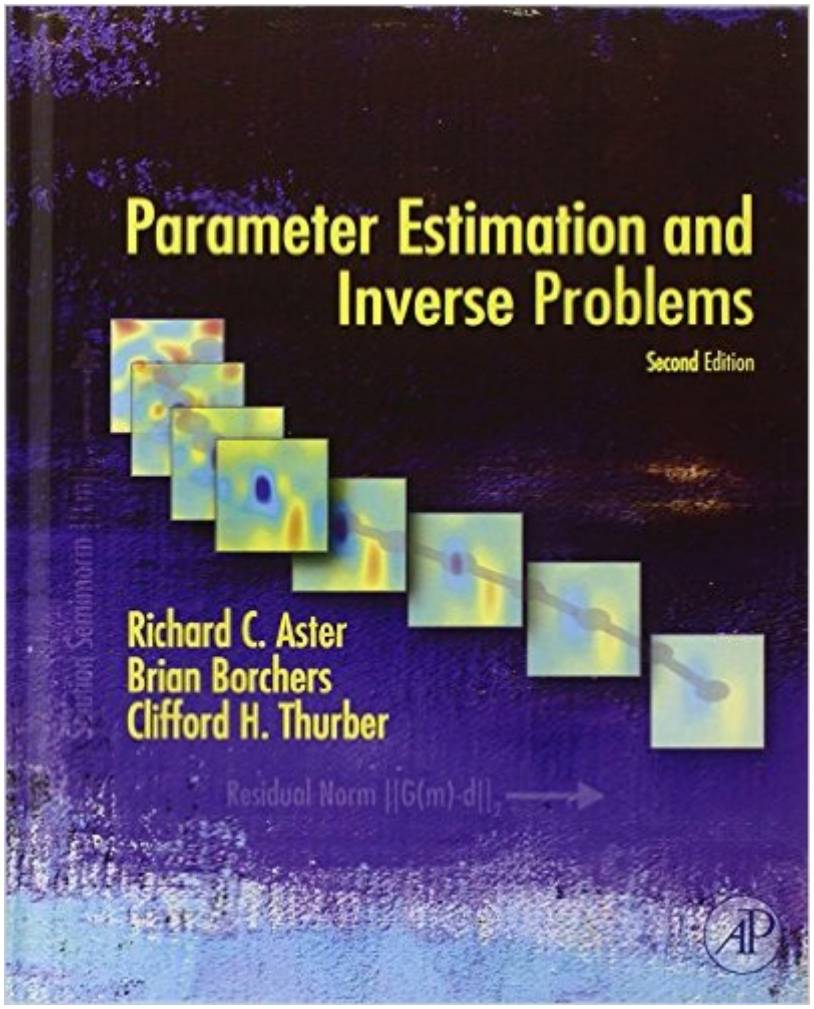
Parameter Estimation And Inverse Problems, Second Edition (International Geophysics)



Synopsis

Parameter Estimation and Inverse Problems, 2eÂ provides geoscience students and professionals with answers to common questions like how one can derive a physical model from a finite set of observations containing errors, and how one may determine the quality of such a model. This book takes on these fundamental and challenging problems, introducing students and professionals to the broad range of approaches that lie in the realm of inverse theory. The authors present both the underlying theory and practical algorithms for solving inverse problems. The authorsâ ™ treatment is appropriate for geoscience graduate students and advanced undergraduates with a basic working knowledge of calculus, linear algebra, and statistics. Parameter Estimation and Inverse Problems, 2eÂ introduces readers to both Classical and Bayesian approaches to linear and nonlinear problems with particular attention paid to computational, mathematical, and statistical issues related to their application to geophysical problems. The textbook includes Appendices covering essential linear algebra, statistics, and notation in the context of the subject. A companion website features computational examples (including all examples contained in the textbook) and useful subroutines using MATLAB.Includes appendices for review of needed concepts in linear, statistics, and vector calculus.Companion website contains comprehensive MATLAB code for all examples, which readers can reproduce, experiment with, and modify.Online instructorâ ™s guide helps professors teach, customize exercises, and select homework problemsAccessible to students and professionals without a highly specialized mathematical background.

Book Information

Series: International Geophysics
Hardcover: 376 pages
Publisher: Academic Press; 2 edition (February 4, 2012)
Language: English
ISBN-10: 0123850487
ISBN-13: 978-0123850485
Product Dimensions: 7.7 x 1 x 9.3 inches
Shipping Weight: 1.6 pounds (View shipping rates and policies)
Average Customer Review: 4.7 out of 5 starsÂ Â See all reviewsÂ (6 customer reviews)
Best Sellers Rank: #252,370 in Books (See Top 100 in Books) #38 inÂ Books > Science & Math > Earth Sciences > Geophysics #100 inÂ Books > Science & Math > Mathematics > Applied > Differential Equations #255 inÂ Books > Textbooks > Science & Mathematics > Environmental

Studies

Customer Reviews

This text was one of two books used for a graduate-level class iI attended for students of geophysics. The second textbook was Tarantola's.Positive: The writing is very readable and the book is well organized. Prerequisite knowledge in statistics, linear algebra and vector calculus is summarised in appendices, which include exercises. The exercises throughout the book are well aligned with the difficulty level. Compared to Tarantola, the Aster et al. book is certainly more accessible for the novice, except for those with a background in pure mathematics. In addition to the exposition and exercises, the book also contains worked examples including, and this is a great plus, Matlab code that can be downloaded and run to follow along. The code is well written and comes with utility libraries that can then be used to work examples or even apply to research problems.Neutral: The organisation of the material is very classical, starting with linear problems and treating non-linear problems. Some may prefer it this way. It happens that the class I attended used Aster et al. to cover the background material (ie, the appendices), then proceeded to general inverse problems through iterative methods using Tarantola, and finally returned to Aster to treat the linear case more in-depth. If I had to teach this class, I would probably do something similar and work through general, potentially non-linear problems before linear problems. The language and examples of Aster et al. are geared towards the seismologist or other solid-earth geophysicist, though there are some that allude to tomography.Negative: The only potentially questionable choice is the total reliance on Matlab.

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