

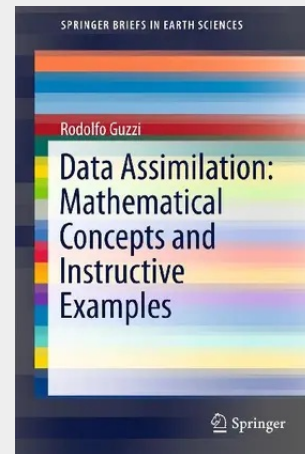
## Data Assimilation: Mathematical Concepts and Instructive Examples

This book endeavours to give a concise contribution to understanding the data assimilation and related methodologies. The mathematical concepts and related algorithms are fully presented, especially for those facing this theme for the first time.

The first chapter gives a wide overview of the data assimilation steps starting from Gauss' first methods to the most recent as those developed under the Monte Carlo methods. The second chapter treats the representation of the physical system as an ontological basis of the problem. The third chapter deals with the classical Kalman filter, while the fourth chapter deals with the advanced methods based on recursive Bayesian Estimation. A special chapter, the fifth, deals with the possible applications, from the first Lorenz model, passing through the biology and medicine up to planetary assimilation, mainly on Mars.

This book serves both teachers and college students, and other interested parties providing the algorithms and formulas to manage the data assimilation everywhere a dynamic system is present.

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