1. Record Nr. UNINA9910255012503321

Autore	Guzzi Rodolfo
Titolo	Data assimilation: mathematical concepts and instructive examples / / by Rodolfo Guzzi
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-22410-7
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (140 p.)
Collana	SpringerBriefs in Earth Sciences, , 2191-5369
Disciplina	519.5
Soggetti	Computer simulation Physical geography Mathematical physics Environmental sciences Water quality Water - Pollution Simulation and Modeling Earth System Sciences Theoretical, Mathematical and Computational Physics Environmental Science and Engineering Water Quality/Water Pollution
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Preface -- 1. Introduction through historical perspective -- 2. Representation of the physical system -- 3. Sequential interpolation -- 4. Advanced data assimilation methods -- 5. Applications -- A. Appendix.
Sommario/riassunto	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 trough 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.