1. Record Nr. UNINA9910300125303321

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Titolo	Saddle-Point Problems and Their Iterative Solution / / by Miroslav Rozložník
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Birkhäuser, , 2018
ISBN	3-030-01431-2
Edizione	[1st ed. 2018.]
Descrizione fisica	1 online resource (XIV, 136 p. 37 illus., 12 illus. in color.)
Collana	Neas Center Series, , 2523-3343
Disciplina	519.4 518
Soggetti	Numerical analysis Numerical Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Introductory remarks. Formulation of saddle-point problem -- Applications leading to saddle-point problems. Augmented systems in least squares problems. Saddle point problems from the discretization of partial differential equations with constraints. Kuhn-Karush-Tucker (KKT) systems in interior-point methods -- Properties of saddle point matrices. The inverse of a saddle-point matrix. Spectral properties of saddle-point matrices -- Solution approaches for saddle-point problems. Schur complement reduction. Null-space projection method -- Direct methods for symmetric indefinite systems. Direct solution of saddle-point problems -- AIterative solution of saddle-point problems. Stationary iteration methods. Krylov subspace methods. Preconditioned Krylov subspace methods -- Saddle-point preconditioners. Block diagonal and triangular preconditioners. Indefinite preconditioning -- Implementation and numerical behavior of saddle-point solvers -- Case study: Polluted undeground water flow modelling in porous media.
Sommario/riassunto	This book provides essential lecture notes on solving large linear saddle-point systems, which arise in a wide range of applications and often pose computational challenges in science and engineering. The focus is on discussing the particular properties of such linear systems, and a large selection of algebraic methods for solving them, with an

emphasis on iterative methods and preconditioning. The theoretical results presented here are complemented by a case study on potential fluid flow problem in a real world-application. This book is mainly intended for students of applied mathematics and scientific computing, but also of interest for researchers and engineers working on various applications. It is assumed that the reader has completed a basic course on linear algebra and numerical mathematics.