1. Record Nr. UNINA9910480322303321

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Titolo	Introduction to Large Truncated Toeplitz Matrices [[electronic resource] /] / by Albrecht Böttcher, Bernd Silbermann
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1999
ISBN	1-4612-1426-2
Edizione	[1st ed. 1999.]
Descrizione fisica	1 online resource (XI, 259 p.)
Collana	Universitext, , 0172-5939
Disciplina	514
Soggetti	Topology Matrix theory Algebra Mathematical analysis Analysis (Mathematics) Linear and Multilinear Algebras, Matrix Theory Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"With 62 figures."
Nota di bibliografia	Includes bibliographical references and index.
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Sommario/riassunto

Introduction to Large Truncated Toeplitz Matrices is a text on the application of functional analysis and operator theory to some concrete asymptotic problems of linear algebra. The book contains results on the stability of projection methods, deals with asymptotic inverses and Moore-Penrose inversion of large Toeplitz matrices, and embarks on the asymptotic behavoir of the norms of inverses, the pseudospectra, the singular values, and the eigenvalues of large Toeplitz matrices. The approach is heavily based on Banach algebra techniques and nicely demonstrates the usefulness of C*-algebras and local principles in numerical analysis. The book includes classical topics as well as results obtained and methods developed only in the last few years. Though employing modern tools, the exposition is elementary and aims at pointing out the mathematical background behind some interesting phenomena one encounters when working with large Toeplitz matrices. The text is accessible to readers with basic knowledge in functional analysis. It is addressed to graduate students, teachers, and researchers with some inclination to concrete operator theory and should be of interest to everyone who has to deal with infinite matrices (Toeplitz or not) and their large truncations.