1.	Record Nr.	UNINA9910151929603321
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	Titolo	Efficient Numerical Methods for Non-local Operators [[electronic resource]] : 2-Matrix Compression, Algorithms and Analysis Corrected 2nd printing, September 2013 / / Steffen Borm
	Pubbl/distr/stampa	Zuerich, Switzerland, : European Mathematical Society Publishing House, 2010
	ISBN	3-03719-591-6
	Descrizione fisica	1 online resource (441 pages)
	Collana	EMS Tracts in Mathematics (ETM) ; 14
	Classificazione	65-xx
	Soggetti	Calculus & mathematical analysis Numerical analysis
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Sommario/riassunto	Hierarchical matrices present an efficient way of treating dense matrices that arise in the context of integral equations, elliptic partial differential equations, and control theory. While a dense $n \times n$ matrix in standard representation requires $n2$ units of storage, a hierarchical matrix can approximate the matrix in a compact representation requiring only $O(nklogn)$ units of storage, where k is a parameter controlling the accuracy. Hierarchical matrices have been successfully applied to approximate matrices arising in the context of boundary integral methods, to construct preconditioners for partial differential equations, to evaluate matrix functions and to solve matrix equations used in control theory. 2-matrices offer a refinement of hierarchical matrices: using a multilevel representation of submatrices, the efficiency can be significantly improved, particularly for large problems. This books gives an introduction to the basic concepts and presents a general framework that can be used to analyze the complexity and accuracy of 2-matrix techniques. Starting from basic ideas of numerical linear algebra and numerical analysis, the theory is developed in a straightforward and systematic way, accessible to advanced students and researchers in numerical mathematics and scientific computing. Special techniques are only required in isolated

sections, e.g., for certain classes of model problems.