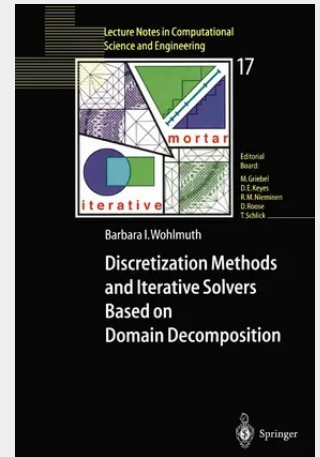


Discretization Methods and Iterative Solvers Based on Domain Decomposition

Domain decomposition methods provide powerful and flexible tools for the numerical approximation of partial differential equations arising in the modeling of many interesting applications in science and engineering. This book deals with discretization techniques on non-matching triangulations and iterative solvers with particular emphasis on mortar finite elements, Schwarz methods and multigrid techniques. New results on non-standard situations as mortar methods based on dual basis functions and vector field discretizations are analyzed and illustrated by numerical results. The role of trace theorems, harmonic extensions, dual norms and weak interface conditions is emphasized. Although the original idea was used successfully more than a hundred years ago, these methods are relatively new for the numerical approximation. The possibilities of high performance computations and the interest in large-scale problems have led to an increased research activity.

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