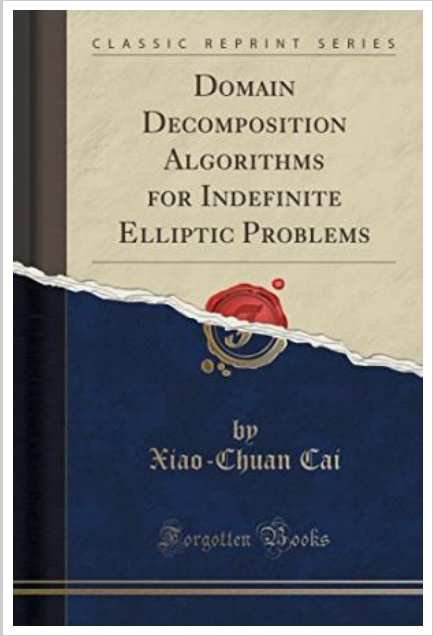

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Domain Decomposition Algorithms for Indefinite Elliptic Problems (Classic Reprint) (Paperback)

By Xiao-Chuan Cai

Forgotten Books, United States, 2015. Paperback. Book Condition: New. 229 x 152 mm. Language: English . Brand New Book ***** Print on Demand *****.Excerpt from Domain Decomposition Algorithms for Indefinite Elliptic Problems Iterative methods for the linear systems of algebraic equations arising from elliptic finite element problems are considered. Methods previously known to work well for positive definite, symmetric problems are extended to certain nonsymmetric problems, which also can have some eigenvalues in the left half plane. We first consider an additive Schwarz method applied to linear, second order, symmetric or nonsymmetric, indefinite elliptic boundary value problems in two and three dimensions. An alternative linear system, which has the same solution as the original problem, is derived and this system is then solved by using GMRES, an iterative method of conjugate gradient type. In each iteration step, a coarse mesh finite element problem and a number of local problems are solved on small, overlapping subregions into which the original region is subdivided. We show that the rate of convergence is independent of the number of degrees of freedom and the number of local problems if the coarse mesh is fine enough. The performance of the method is illustrated by results...

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