

**Marchuk, G. I.; Kuznetsov, Yu. A.; Matsokin, A. M.**

**Fictitious domain and domain decomposition methods.** (English) Zbl 0825.65027  
Sov. J. Numer. Anal. Math. Model. 1, No. 1, 3-35 (1986).

Summary: The fictitious domains and domain decomposition methods are treated as iterative methods in subspaces, developed for solving the systems of linear algebraic equations. The first part of the paper is devoted to the algebraic theory of these two methods, and the second part to their application to solving large systems of grid equations. Detailed analysis is given of the application of the generalized conjugate gradient technique to increasing the rate of convergence of iterative procedures, and in particular, to its implementation as a computational process in a subspace. Estimates are given of the complexity of algorithm realizations in model problems.

**MSC:**

**65F10** Iterative numerical methods for linear systems

**65N55** Multigrid methods; domain decomposition for boundary value problems involving PDEs

Cited in **23** Documents

**Keywords:**

fictitious domains; domain decomposition methods; iterative methods; conjugate gradient; convergence; complexity