Numerical implementation of the method of fictitious domains for elliptic equations

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Abstract: In the paper we study the elliptical type equation with strongly changing coefficients. We are interested in studying such equation because the given type equations are yielded when we use the fictitious domain method. In this paper we suggest a special method for numerical solution of the elliptic equation with strongly changing coefficients. We have proved the theorem for the assessment of developed iteration process convergence rate. We have developed computational algorithm and numerical calculations have been done to illustrate the suggested method effectiveness.

Keywords: elliptical equation, Dirichlet problem, the equation with rapidly changing coefficients, computational algorithm, iterative process, fictitious domain method, boundary conditions

2010 Mathematics Subject Classification: 97N40

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