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Iterative methods of solving ill-posed boundary-value problems. (English. Russian original)

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Summary: Minimization of a quadratic functional with control at the boundary and observation on a certain surface is studied. The Cauchy problem for elliptic equations and other ill-posed boundary-value problems is considered as a special case. An iterative procedure is obtained for solving the problem by means of iterative regularization, the iterational parameters being found explicitly. The convergence of the process is accelerated by making use of the specific features of the given functional.

MSC:

65Z05 Applications to the sciences

65N12 Stability and convergence of numerical methods for boundary value problems involving PDEs

35R25 Ill-posed problems for PDEs

35J25 Boundary value problems for second-order elliptic equations

Keywords:

Tikhonov's method; minimization; quadratic functional; Cauchy problem; elliptic equations; ill-posed boundary-value problems; iterative regularization; convergence