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The Schwarz alternation method in a subspace. (English. Russian original) Zbl 0611.35017
Sov. Math. 29, No. 10, 78-84 (1985); translation from *Izv. Vyssh. Uchebn. Zaved., Mat.* 1985, No. 10(281), 61-66 (1985).

On the domain $\Omega \subset R^2$ with the Lipschitz boundary $\partial\Omega = \Gamma_0 \cup \Gamma_1$, a problem with conditions on Γ_0 and Γ_1 is considered. Γ_0 is a finite union of some curvilinear segments.

The problem is to be solved in the space

$$W_2^1(\Omega, \Gamma_0) = \{v \in W_2^1(\Omega) \mid v(x) = 0, \quad x \in \Gamma_0\},$$

considering the bilinear form

$$a(u, v) = \int_{\Omega} \left(\sum_{i,j=1}^3 a_{ij}(x) (\partial u / \partial x_j) (\partial v / \partial x_i) + a_0(x) uv \right) d\Omega + \int_{\Gamma_1} \sigma uv ds$$

and the linear functional $\ell(v) = \int_{\Omega} f v d\Omega$.

The domain Ω is decomposed in a union of more simple subdomains. For the obtained subdomains the Schwarz alternation method is used. Then the solution of the boundary problem is obtained by the intermediate of an auxiliary problem on the union of the boundaries of the considered subdomains.

Reviewer: [I.Onciulescu](#)

MSC:

- 35J25 Boundary value problems for second-order elliptic equations
- 46E35 Sobolev spaces and other spaces of "smooth" functions, embedding theorems, trace theorems
- 35D05 Existence of generalized solutions of PDE (MSC2000)

Cited in **23** Documents

Keywords:

iteration process; Sobolev space; subdomains; Schwarz alternation method