ABOUT SOME RETURN TASKS FOR ELLIPTICAL EQUATIONS

Aliyev R. A.

The Azerbaijan University of Cooperation
Chair: "Information and economic information systems"
Azerbaijan, AZE 1106, N.Narimanov 8b,
tel.: (99412) 4360589, 5628745, e-mail:aramiz56@mail.ru

The number of applied tasks is connected to definition of coefficients of an elliptical equation under some additional information on solution. In particular, definition heat physics environment characteristics in a stationary case leads to the return task for an elliptical equation.

The return tasks for the queasy linear equations of elliptic type are considered in operations [1-2]. Let D – the bounded area n-dimensional evklid spaces E_n. $x=(x_1, x_2, x_3,\ldots x_n)$- any point belonging D, Γ – the border of area D assumed enough smooth and, $\Gamma = \Gamma_1 + \Gamma_2$, p_0, p_1 - the set numbers. $Q \equiv [p_0, p_1]$. We will consider the task about definition from following conditions $\{k_n(u), q(u), u(x,p)\}$:

$$-\sum_{i=1}^{n} k_i(u) u_{x_i x_i} + q(u)u = h(x,p), x \in D, p \in Q$$

$$u(x,p)\,|_{\Gamma_1} = f_1(\xi,p), \quad \xi \in \Gamma_1, \quad p \in Q$$

$$u_{\upsilon_1}(x,p)\,|_{\Gamma_2} = f_2(\xi,p), \quad \xi \in \Gamma_2, \quad p \in Q$$

$$k_n(F_1)\; u_{\upsilon_2}(\xi_1,p) = g_1(p), \quad p \in Q$$

$$k_n(F_2)\; u_{\upsilon_2}(\xi_2,p) = q(F_2)\varphi(p) + g_2(p), \quad p \in Q$$

where i = 1,2 – the fixed points the set functions, $\Gamma_1, F_i = F_i(p) = f_1(\xi_i, p), i = 1,2,$ $h(x,y), f_1(\xi,p), f_2(\xi,p), \phi(p), g_i(p), i = 1,2,$ $k_i(u), i = 1,2,\ldots,n-1,\ 0 < k_i(u) \in C_{1+\alpha}[R_1, R_2],$ i=1, 2,…,n-1, h(x, p), at any belong $p \in Q$ according to spaces $C_\alpha(\bar{D}), C_{2+\alpha}(\Gamma_1), C_{1+\alpha}(\Gamma_2)$ and on p belong $C_\alpha(Q), g_i(p) \in C_\alpha(Q), i = 1,2, \psi(P) \in C_\alpha(Q)$, υ_1 – a direction of an external normal to boundary Γ_2, υ_2 – a direction of an internal normal to boundary $\xi_i, i = 1,2$ $u_{\upsilon_2}(\xi_i,p) = \dfrac{\partial u}{\partial \upsilon_2}(\xi_i,p), i = 1,2$ in point R1, R2 – some numbers. Let's assume that functions $F_i(p), i = 1,2$ have opposites $\varphi_i(F_i), i = 1,2$ defined on [R1, R2] in the field of value on Q and belongings $C_\alpha(Q)$. The thesis is devoted to research of questions of a correctness of this class of return tasks for elliptical equations.

References

1. Iskenderov A.D. The return task about definition of coefficients of a quasilinear elliptical equation.//Izv. AN Az. SSR. № 2, s.80-85.
2. Klibanov M.V. Uniqueness as a whole return tasks for one class of the differential equations.//Dif.uravnenija.1984. т.20, № 11, s.1947-1953.