Moroz, M. V.

The process of heat conductivity with autoregulating impulse support. (Ukrainian)

Zbl 1004.35119
Kraj. Zadachi Dyfer. Rivnyan' 3, 85-92 (1998).

The article deals with the parabolic differential equation $\frac{\partial u}{\partial t} = a\Delta u(x,t), (x,t) \in \Omega \times \mathbb{R}_+$, $u(x,t) = 0, (x,t) \in \partial\Omega \times \mathbb{R}_+, u(x,0) = u_0(x), x \in \Omega$, under the condition of impulse influence $(u(x,t^+) - u(x,t^-))|_{I_u(t)=I_0} = \alpha(x)$, where $\alpha(x)$ is a known function, $I_u(t) = \int_\Omega u(x,t)dx$ is a regularizing functional, $u_0 \in C(\Omega, \mathbb{R}_+)$, $\Omega = [0,l_1] \times \cdots \times [0,l_n]$. The author proves existence of an infinite sequence of the impulsive moments. Conditions of existence and uniqueness of a periodic solution to the original problem are proposed.

Reviewer: Yu.I.Kaplun (Kyïv)

MSC:

35R12 Impulsive partial differential equations
35K20 Initial-boundary value problems for second-order parabolic equations

Keywords:

regularizing functional; impulsive moments; existence; uniqueness; periodic solution