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ON A SOME TYPE INTEGRO-DIFFERENTIAL EQUATIONS

In the fifties of the twentieth century I.Vekua (see, e.g.,[1]) raised the problem of investigation of cusped plates. The question of investigation of a bending of such plates can be reduced to some classes of integro-differential equation.

Our aim is to study the solvability of the Couchy problem of integro-differential equation as follows [2]

$$\varphi(x,t) - \int_0^l K(x,\xi)\varphi_{,tt}(\xi,t)d\xi = f(x,t),$$
$$\varphi(x,0) = \psi_1(x), \quad \varphi_{,t}(x,0) = \psi_2(x), \quad x \in [0,l],$$

where $K(x,\xi)$, $f(x,t)$, $\psi_i(x)$ $(i=1,2)$ are given continuous functions

$$K(x,\xi) \in C([0,l]\times[0,l]), \quad f(x,t) \in C(\Omega), \quad \psi_i \in C([0,l]),$$
$$\varphi(x,t) \in C([0,l]) \cap C^1(t \geq 0) \cap C^2(t > o), \quad \Omega = [0,l] \cap (t \geq 0).$$

References

[1] Vekua, I.N., Shell theory: General methods of construction. Pitman Advanced Publishing Program, Boston-London-Melbourne, 1985.

[2] Chinchaladze, N., On a One Integro-differential Equations. Bulletin of TICMI (Tbilisi International Centre of Mathematics and Informatics), vol.4, 2000, 37-40.