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10. Partial Differential Equations

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Krutitskii, Pavel, Moscow State University, Russia

Initial-boundary value problems in multiply connected domains for an equation of composite type

We study initial-boundary value problems with Dirichlet and Neumann boundary conditions in interior and exterior multiply connected domains for an evolutionary PDE of 4-th order and composite type. Similar equations comprises properties of elliptic and hyperbolic equations and control propagation of interhal waves in stratified and rotating fluid. Neumann boundary condition contain time derivatives. We study boundary value problems with the help of the theory of dynamic potentials which is close to the potential theory for elliptic or parabolic equations. Using dynamic potentials we reduce boundary value problems to the time-dependent integral equations on the boundary. By means of analysis of the integral equations we obtain the solvability theorems for the original initial-boundary value problems. Uniqueness theorems can be proved by the method of integral equalities.