

On one nonclassical problem for the Laplace equation

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Abstract

Nonlocal problems received special attention over the past few decades due to efficient descriptions of various phenomena in physics, chemistry and engineering in cases when data from the boundary of the process or initial data are not available. In this paper, we study a nonclassical problem for the Laplace equation with nonlocal integral boundary conditions in the rectangular domain. We introduce a number of auxiliary problems, obtain a system of integral equations and then construct a recurrent relation based on the homotopy analysis method (HAM) to find a solution of the nonlocal problem. The existence and uniqueness theorem is proved.