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INVERSE BOUNDARY PROBLEM AS APPROACH FOR THE HEAT TRANSFER IN L-SHAPE DOMAIN

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A heat transfer problems for L-shape domains arise for extended surfaces, such as fins attached to a primary heat transfer surface (wall). These are used extensively in various branches of engineering, including aircraft and aerospace [1; 2]. Therefore the modelling of heat transfer by steady-state conditions in these systems is very actual problem. In our previous publications we have constructed approximate two-dimensional solutions of this problem [3; 4; 5]. Usually this problem was solved in the one-dimensional approximation [1; 6]. In paper [7] we constructed the exact analytical two-dimensional solution.

Here a two-dimensional heat transfer in the element of a periodic system with a rectangular fin has been studied analytically. The well known one-dimensional statement of problem is examined. Further we solve the system of ordinary differential equations, which is obtained from the two-dimensional problem statement by the method of conservative averaging, and we receive an approximate solution. Finally we receive the exact solution of two-dimensional problem by using Green functions for two rectangles (the wall and the fin). This solution is obtained in several forms of Fredholm's integral equation of the second kind. In this talk it is shoved, that all this solutions can be obtained from different boundary inverse problems for heat equation in rectangular.

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