The Temperature Field of the Isotropic Cooled Plate Affected by Axisymmetric Oscillatory Heat Flow

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The paper deals with a temperature field formation process in a flat isotropic plate of the constant thickness, one of its surfaces is affected by an axisymmetric oscillating thermal stream with Gaussian intensity, and another one is cooled by the ambient with a constant thermolysis coefficient and a temperature equal to a plate reference temperature. To describe a process under investigation a two dimensional mathematical model of non-stationary heat conductivity in a cylindrical coordinate frame is used. As follows from the model analysis, the temperature field of a cooled plate is a composition of two temperature fields, the first of which has no limit stationary distribution, and the second one has exceptionally a diffusive nature. Solutions for the corresponding heat conductivity problems: regional and mixed (initial and regional) conductivity, defining the solution for the original problem of transient heat conductivity are found by means of the general theory of integrated transformations in an analytically closed form.

Keywords**:** *cooled isotropic plate, oscillatory axisymmetric heat action, temperature field, integral transformation.*

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