

MATHEMATICAL MODELING OF THE FOREST FIRE IMPACT ON THE BRANCH OF A CONIFEROUS TREE

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It is necessary to develop quantitative methods to assess the formation of thermal burns in the morphological parts of coniferous trees. The purpose of the study can be formulated as follows: mathematical modeling of heat transfer in the layered structure of a coniferous tree branch under the influence of a forest fire front. The heat propagation in the “branch-needles-flame zone” system is described by a system of non-stationary differential equations of heat conduction with the corresponding initial and boundary conditions. As an object of research, a digital model of a branch of a coniferous tree for various species, namely, pine, larch and fir, was used. Temperature distributions are obtained for different variants of the branch structure and conditions of the impact of the forest fire front. Conclusions are made about the need for further modernization of the mathematical model. The developed model is the basis for creating software tools for specialized geographic information systems.

Key words: *forest fire, branch, heat transfer, impact, thermal injure*

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