# IDENTIFICATION OF MATHEMATICAL MODEL OF MULTILAYER THERMAL INSULATION

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ABSTRACT.  The purpose of this paper is to introduce an iterative regularization method in the research of radiative and thermal properties of materials with further applications in the design of Thermal Control Systems (TCS) of spacecrafts. In this paper the radiative and thermal properties (heat capacity, emissivity and thermal conductance) of a multilayered thermal-insulating blanket (MLI), which is a screen-vacuum thermal insulation as a part of the (TCS) for perspective spacecrafts, are estimated. Properties of the materials under study are determined in the result of temperature and heat flux measurement data processing based on the solution of the Inverse Heat Transfer Problem (IHTP) technique. Given are physical and mathematical models of heat transfer processes in a specimen of the multilayered thermal-insulating blanket located in the experimental facility. A mathematical formulation of the IHTP, based on sensitivity function approach, is presented too. The practical testing was performed for specimen of the real MLI. This paper consists of recent researches, which developed the approach suggested at [1].