

PARAMETERS ESTIMATION FOR MULTILAYER THERMAL INSULATION

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ABSTRACT. The purpose of this paper is to introduce a new 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 (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 inverse heat conduction problem is presented too. The practical approves were made for specimen of the real MLI