

The determination of the thermal properties of unconsolidated materials

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Abstract

Heat transfer in a composite cylindrical region is considered. An approximate analytical solution of the direct problem is obtained. It is shown that, beginning at the instant $t > t_*$, the relative error of the solution obtained does not exceed 1%. On the basis of this, algorithms are constructed which enable inverse problems to be solved effectively. Examples of the use of the algorithms to determine the thermal properties of unconsolidated materials are presented. © 2012 Springer Science+Business Media, Inc.

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Keywords

Computational experiment, Heat capacity, Regular thermal conditions, Thermal conductivity, Thermal diffusivity, Unconsolidated media