

INCREASING OF ACCURACY FOR ENGINEERING CALCULATION OF SOME HEAT TRANSFER PROBLEMS IN TWO LAYER MEDIA

HARIJS KALIS¹ and ILMĀRS KANGRO²

¹*Institute of Mathematics of Latvian Academy of Sciences and University of Latvia*

Akadēmijas laukums 1, LV-1524, Rīga, Latvia

²*Rēzekne Higher Education Institution*

Atbrīvošanas aleja 90, LV-4601, Rēzekne, Latvija

E-mail: ¹harijs.kalis@lu.lv, ²kangro@cs.ru.lv

In this paper we study the simple algorithms in the modelling of the heat transfer problem in two layer media reducing the partial differential equation up to ordinary differential equations (ODEs). The increasing of accuracy is shown if instead of initial value problem of first order ODE [1; 2; 3] the second order differential equations is taken. Such a procedure allows us to obtain a simple engineering algorithm for solving heat transfer equations in two layered domain of Cartesian, cylindrical (with axial symmetry) and spherical coordinates (with radial symmetry). In a stationary case the exact finite difference scheme is obtained. The stationary and non-stationary solution with radiation and without radiation for heat transfer in cylindrical wire with insulation are considered [4].

REFERENCES

- [1] H. Kalis and I. Kangro. Simple methods of engineering calculation for solving heat transfer problems. *Math. Model. Anal.*, **8** (1), 2003, 33 – 42.
- [2] H. Kalis and A. Lasis. Simple algorithm's for calculation the axial-symmetric heat transport problem in a cylinder. *Math. Model. Anal.*, **6** (2), 2001, 262 – 269.
- [3] H. Kalis. Effective finite-difference schemes for solving some heat transfer problems with convection in multilayer media. *Int. J. Heat Mass Transfer*, **43** (24), 2000, 4467 – 4474.
- [4] A. Ilgevičus and H.-D. Liess. Calculation of the heat transfer in cylindrical wires and electric fuses by implicit finite volume method. *Math. Model. Anal.*, **8** (3), 2003, 217 – 228.