STUDENT SECTION

Thermal Transfer Through the Walls of an Enclosed Area – Different Methods of Simulation

Andreea Maria Neacă [1] and Mitică Iustinian Neacă [2]

[1] PhD. student at the Department of Automatics, Electronics and Mechatronics, Faculty of Automatics, Computers and Electronics, University of Craiova, Romania, neaca_andreea@yahoo.com

[2] Department of Electrical, Energetic and Aerospace Engineering, Faculty of Electrical Engineering, University of Craiova, Romania, ineaca@elth.ucv.ro

Abstract— In this paper we present few methods to simulate the thermal transfer through a wall of a closed area. Every method is expressed by mathematical equations and it is simulated with the help of Matlab Simulink kit. The heat is lost by heat transfer through the surfaces and by exchange of air between the heated space and the surroundings. The results from the various methods are seen on the scopes are compared. We made the simulation model for the studied wall through the heat is lost, in four wais, with different methods in order to determine the mathematical model. For every model it is also described the mathematical model, and the analogies with electrical circuits in order to determine the transfer function, by applying Laplace transform. There are also presented two methods to determine the matrices for the linear system. After each simulation, we could observe that the results were similar. It can be said that they were identical, and this proves the fact that all the methods are correct.