World Academy of Science, Engineering and Technology
International Journal of Aerospace and Mechanical Engineering
Vol:11, No:03, 2017

# Heat Source Temperature for Centered Heat Source on Isotropic Plate with Lower Surface Forced Cooling Using Neural Network and Three Different Materials

**Authors :** Fadwa Haraka, Ahmad Elouatouati, Mourad Taha Janan

**Abstract :** In this study, we propose a neural network based method in order to calculate the heat source temperature of isotropic plate with lower surface forced cooling. To validate the proposed model, the heat source temperatures values will be compared to the analytical method -variables separation- and finite element model. The mathematical simulation is done through 3D numerical simulation by COMSOL software considering three different materials: Aluminum, Copper, and Graphite. The proposed method will lead to a formulation of the heat source temperature based on the thermal and geometric properties of the base plate.

**Keywords :** thermal model, thermal resistance, finite element simulation, neural network
**Conference Title :** ICMEAM 2017 : International Conference on Mechanical Engineering and Applied Mechanics
**Conference Location :** Rome, Italy
**Conference Dates :** March 05-06, 2017