

Experimental investigation for estimation of thermal boundary conditions by using inverse heat transfer techniques

Abstract

In inverse heat conduction problems, temperatures that are measured at certain locations in the solid are used in order to determine boundary conditions, thermo-physical properties, unknown geometries, or the energy generation rate. By taking a temperature measurement at a location inside the solid at different times, the surface heat flux and other thermal properties can be estimated. Estimation of thermal properties and thermal boundary conditions are essential for composite or newly invented materials used in various industries such as nuclear, aerospace, chemical, medical etc. In this work, the conjugate gradient method (CGM) with adjoint problem has been applied for the functional estimation of space and time varying thermal conditions. No prior knowledge of the functional form of thermal conditions is available.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: B.E./B.Tech. Mechanical Engineering

3) Academic Project duration:

(a) Total academic project duration: 17 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

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