
Thermal characterization of homogeneous materials using a virtual function

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Abstract

A new method for the thermal characterization of homogeneous materials is proposed. It is based on a Low Order Weak Formulation (LOWF) of the heat equation using a virtual test function. In this formulation, the spatial derivatives of temperature are substituted by an analytical expression whose the interest is to be not dependent of the measurement noise. By this way, the LOWF leads to a more robust estimation of the thermal diffusivity. The performances of the method are compared numerically with those of the nodal method in the case of a thin sample and an experimental validation is carried out.

This paper was published in the QIRT Journal 11.2