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A NEW MULTIFIELD FINITE ELEMENT METHOD IN STEADY STATE HEAT ANALYSIS

ABSTRACT

A new original primal-mixed finite element approach and related hexahedral finite element for the analysis of behavior of solid bodies under thermal loading is presented. The essential contributions of the present approach is the treatment of temperature and heat flux as fundamental variables that are simultaneously calculated, as well as capability to introduce initial and prescribed temperature and heat flux. In order to minimize accuracy error and enable introductions of flux constraints, the tensorial character of the present finite element equations is fully respected. The proposed finite element is subjected to some standard benchmark tests in order to test convergence of the results, which enlighten the effectiveness and reliability of the approach proposed.

KEYWORDS

[steady state heat](#), [finite elements](#), [mixed formulation](#)

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