

Luo, Zhendong; Xie, Zhenghui; Chen, Jing

A reduced MFE formulation based on POD for the non-stationary conduction-convection problems. (English) [Zbl 1249.65199](#)

Acta Math. Sci., Ser. B, Engl. Ed. 31, No. 5, 1765-1785 (2011).

Summary: A reduced mixed finite element (MFE) formulation based on proper orthogonal decomposition (POD) for the non-stationary conduction-convection problems is presented. Also the error estimates between the reduced MFE solutions based on POD and usual MFE solutions are derived. It is shown by numerical examples that the results of numerical computation are consistent with theoretical conclusions. Moreover, it is shown that the reduced MFE formulation based on POD is feasible and efficient in finding numerical solutions for the non-stationary conduction-convection problems.

MSC:

- [65M60](#) Finite element, Rayleigh-Ritz and Galerkin methods for initial value and initial-boundary value problems involving PDEs
- [35K20](#) Initial-boundary value problems for second-order parabolic equations
- [65M15](#) Error bounds for initial value and initial-boundary value problems involving PDEs

Cited in **9** Documents

Keywords:

proper orthogonal decomposition; mixed finite element formulation; error estimate; non-stationary conduction-convection problems; numerical examples

Full Text: [DOI](#)