

The k-version of the finite element method and hpk-adaptive processes

Albert Romkes, *The University of Kansas*

Karan S. Surana, *The University of Kansas*

J.N. Reddy, *Texas A&M University*

The k-version of the finite element method is a new emerging technology in which k , the order of global differentiability of the finite element approximation, is an independent parameter in addition to the parameters, h and p , used in current approaches.

This minisymposium focuses on recent developments in hpk finite element analysis and adaptive processes. Papers are invited that address, but not limited to, the issues of: the development of well-posed variational formulations. The construction of higher-order, globally differentiable, local approximations in one-, two-, and three-dimensional spaces; the development of an a priori and a posteriori error estimation methodology that includes the dependence of the error on k ; and the design of hpk-adaptive processes for efficient control of numerical errors. Emphasis will be placed on novel computational techniques, nonlinear analyses, error estimation, and adaptive methods. Examples include:

- * k-Version methods
- * h , p , hp , or hpk adaptive methods
- * mathematical aspects: well-posedness and control of numerical error
- * mesh-free least-squares methods
- * novel applications
- * multiphysics and fluid-solid interaction problems