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Discontinuity-capturing finite element formulations for nonlinear convection-diffusion-reaction equations. (English) Zbl 0593.76096

Comput. Methods Appl. Mech. Eng. 59, 307-325 (1986).

Formulations which complement the streamline-upwind/Petrov-Galerkin procedure are presented. These formulations minimize the oscillations about sharp internal and boundary layers in convection-dominated and reaction-dominated flows. The proposed methods are tested on various single- and multi-component transport problems.

MSC:

76R99 Diffusion and convection

76M99 Basic methods in fluid mechanics

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Keywords:

streamline-upwind/Petrov-Galerkin procedure; oscillations about sharp internal and boundary layers; convection-dominated and reaction-dominated flows; multi-component transport problems; electrophoresis separation phenomena

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