Fakultät für Maschinenwesen

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Titel des Beitrags: Information-flux method: a meshfree maximum-entropy Petrov-Galerkin method including stabilised finite element methods
Abstract: An information-flux method incorporating a novel approach to stable methods is proposed. The method may be considered as a meshfree Petrov–Galerkin approximation scheme with basis functions based on the principle of maximum entropy. The two goals of accuracy and stability are distinctly assigned to solution and weighting functions, respectively. It is emphasised that stability can be ensured if the weighting functions are chosen such that they resemble the information flux of the underlying physical problem. In this study, the proposed method is applied to convection-dominated convection–diffusion problems. A seamless transition of the proposed method to stabilised finite element methods is demonstrated for increasing locality of the basis functions in one dimension; for lower localities, a superior convergence behaviour can be shown compared to stabilised finite elements. The method is presented and discussed for the general multi-dimensional case, with numerical results shown for one- and two-dimensional problems.
Stichworte: meshfree methods, maximum-entropy,
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