ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

15. Numerical Analysis and Scientific Computing

1991 MS Classification: 65, 68, 80, 92

Erdmann, Bodo, Lang, Jens, Roitzsch, Rainer, Konrad–Zuse–Zentrum Berlin, Germany:

Mesh Controlling Strategy for Solving Nonlinear Evolution Problems.

Fully adaptive solutions of nonlinear evolution problems employing the discretization sequence first in time then in space are considered. The time discretization is done by linearly implicit one–step methods possibly of high order with automatic step size control. A posteriori error estimates for the stabilized finite element discretization in space are obtained by solving local Dirichlet problems with higher accuracy. These estimates are used to control time and space grids. This strategy is implemented in the code KARDOS and proved to be efficient in a large range of applications. We present results from 3D–hyperthermia treatment and combustion problems.

Reference: J. Lang, Adaptive FEM for Reaction–Diffusion Equations, *Appl. Numer. Math (***26** (1998), 105–116.