

1036-65-11

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In this talk we discuss a semi-adaptive iterative splitting method for the numerical solution of two-dimensional reaction-diffusion equations. The adaptive mesh in one spacial dimension is imposed through an arc-length formulation during discretization, and controlled as well by stiffness indexes from iterative splitting process. A throughout stability analysis is derived to exam the adaptive finite difference scheme.

A priori and a posteriori error estimates are also obtained. The information gathered can be used to improve the adaptivity of our schemes. Numerical experiments are given to illustrate our contributions. We present the stiffness features involved and at the end the talk, we discuss the conclusions and expectations. (Received October 23, 2007)