

MAXIMUM-NORM A POSTERIORI ERROR ESTIMATES FOR PARABOLIC EQUATIONS

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ABSTRACT. Second-order parabolic equations are considered. For these equations, we give a posteriori error estimates in the maximum norm that improve upon recent results in the literature. In particular it is shown that logarithmic dependence on the time step size can be eliminated.

Semidiscrete and fully discrete versions of the backward Euler and of the Crank-Nicolson methods are considered. For their full discretizations, we employ elliptic reconstructions that are, respectively, piecewise-constant and piecewise-linear in time. Certain bounds for the of the Green's function of the parabolic operator are also employed.

Keywords: parabolic problems, maximum-norm a posteriori error estimates, backward Euler, Crank-Nicolson, elliptic reconstructions

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