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A Crank-Nicolson scheme for a class of delay nonlinear parabolic differential equations.

(Chinese. English summary) [Zbl 1240.65266](#)

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Summary: A linearized Crank-Nicolson scheme is established for a class of delay nonlinear parabolic differential equations with Dirichlet boundary value conditions. It is proved that the difference scheme is unconditionally stable and convergent in the L_∞ -norm. The convergence order is $O(r^2 + h^2)$. Finally, a numerical example is provided to support the theoretical results.

MSC:

- [65M06](#) Finite difference methods for initial value and initial-boundary value problems involving PDEs
- [65M12](#) Stability and convergence of numerical methods for initial value and initial-boundary value problems involving PDEs
- [35R10](#) Partial functional-differential equations
- [35K55](#) Nonlinear parabolic equations

Cited in **4** Documents

Keywords:

Crank-Nicolson difference scheme; convergence; stability; delay nonlinear parabolic differential equations; numerical example