

# THE GLOBAL DUFORT-FRANKEL DIFFERENCE APPROXIMATION FOR NONLINEAR REACTION-DIFFUSION EQUATIONS

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摘要

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# THE GLOBAL DUFORT-FRANKEL DIFFERENCE APPROXIMATION FOR NONLINEAR REACTION-DIFFUSION EQUATIONS

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**Abstract** In this paper, the initial value problem of nonlinear reaction-diffusion equation is considered. The Dufort-Frankel finite difference approximation for the long time scheme is given for the  $d$ -dimensional reaction-diffusion equation with the two different cases. The global solution and global attractor are discussed for the Dufort-Frankel scheme. Moreover properties of the solution are studied. The error estimate is presented in a finite time region and in the global time region for some special cases. Finally the numerical results for the equation are investigated for Allen-Cahn equation and some other equations and the homoclinic orbit is simulated numerically.

**Key words** [global Dufort-Frankel method](#) [reaction-diffusion equation](#) [global attractor](#) [error estimate](#) [numerical experiments](#)

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