

GLOBAL EXISTENCE AND BLOW-UP FOR A DEGENERATE PARABOLIC SYSTEM WITH NONLOCAL SOURCE

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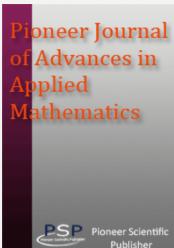
Abstract

This paper investigates the global existence and blow-up of nonnegative solutions of the nonlocal degenerate parabolic system

 $u_t = \Delta u^m + ||uv||_{\alpha}^p, \quad v_t = \Delta v^n + ||uv||_{\beta}^q, \quad (x, t) \in \Omega \times (0, T)$

with homogeneous Dirichlet boundary data. By using the super- and sub-solution techniques, the critical exponent of the system is determined. Namely, if $p_c = pq - (m - p)(n - p) < 0$ every nonnegative solution is global, whereas if $p_c > 0$, there exist both global and blow-up nonnegative solutions. When $p_c = 0$, we show that if the domain Ω is sufficiently small, every nonnegative solution is global while if the domain large enough that is, if it contains a sufficiently large ball and initial data is sufficiently large, there exists no global solution.

Keywords and phrases: nonlocal source, degenerate parabolic system, global existence, blow-up.



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