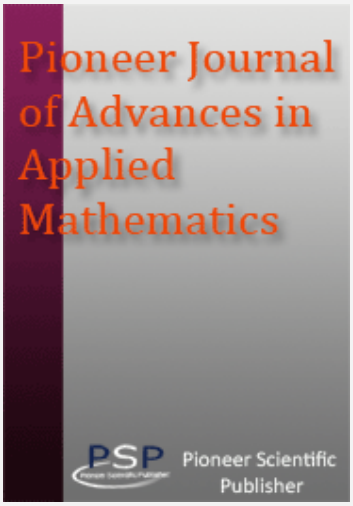
Pioneer Journal of Advances in Applied Mathematics
Volume 4, Issue 1, Pages 1-12 (February 2012)

ISSN: 2231-1858



GLOBAL EXISTENCE AND BLOW-UP TO A *P*-LAPLACIAN PARABOLIC SYSTEM WITH NONLINEAR MEMORY

Lixin Shi

Abstract

This paper deals with a *P*-Laplacian parabolic system with nonlinear memory

$$u_t - div(|\nabla u|^{p-2}\nabla u) = u^m \int_0^t v^\alpha ds$$

$$v_t - div(|\nabla v|^{q-2}\nabla v) = v^n \int_0^t u^\beta ds$$

with homogeneous Dirichlet boundary conditions in a bounded domain $\Omega \subset R^N$, where $p,\ q > 2,\ \alpha, \beta, m,\ n \geq 1$. Under appropriate hypotheses, we obtain that the solution either exists globally or blows up in finite time.

Keywords and phrases: *P*-Laplacian, quasilinear degenerate parabolic system, blow up, global existence, nonlinear memory.