

**De Mottoni, Piero; Schiaffino, Andrea; Tesei, Alberto**

**Attractivity properties of nonnegative solutions for a class of nonlinear degenerate parabolic problems.** (English) [Zbl 0556.35083](#)

Ann. Mat. Pura Appl., IV. Ser. 136, 35-48 (1984).

The authors study the large time behavior of nonnegative solutions to an initial-boundary value problem. Using monotonicity methods they investigate attractivity properties to the associated stationary problem. Finally they apply the results to two models suggested by population dynamics.

Reviewer: [J.Schoenenberger-Deuel](#)

**MSC:**

- [35K60](#) Nonlinear initial, boundary and initial-boundary value problems for linear parabolic equations
- [35B40](#) Asymptotic behavior of solutions to PDEs
- [92D25](#) Population dynamics (general)
- [35B30](#) Dependence of solutions to PDEs on initial and/or boundary data and/or on parameters of PDEs
- [35K65](#) Degenerate parabolic equations

Cited in **1** Review  
Cited in **24** Documents

**Keywords:**

large time behavior; nonnegative solutions; initial-boundary value problem; monotonicity methods; attractivity properties; stationary problem; population dynamics

**Full Text:** [DOI](#)

**References:**

- [1] H. W. Alt - S. Luckhaus, Quasi-linear elliptic-parabolic differential equations, Sonderforschungsbereich 123, Preprint n. 136, University of Heidelberg, 1981. · [Zbl 0497.35049](#)
- [2] Amann, H., On the existence of positive solutions of nonlinear boundary value problems, Indiana Univ Math. J., 21, 125-146 (1971) · [Zbl 0209.13002](#)
- [3] Aronson, D. G.; Crandall, M. G.; Peletier, L. A., Stabilization of solutions of a degenerate nonlinear diffusion problem, Nonl. Anal. TMA, 6, 1001-1022 (1982) · [Zbl 0518.35050](#)
- [4] Aronson, D. G.; Peletier, L. A., Large time behaviour of solutions of the porous medium equation in bounded domains, J. Differential Equations, 39, 378-412 (1981) · [Zbl 0475.35059](#)
- [5] Berestycky, H.; Lions, P. L.; Bardos, C.; Lasry, M.; Schatzmann, M., Some applications of the method of super and subsolutions, Bifurcation and Nonlinear Eigenvalue Problems, 16-41 (1980), Berlin-Heidelberg-New York: Springer, Berlin-Heidelberg-New York
- [6] Brézis, H.; Crandall, M. G., Uniqueness of solutions of the initial-value problem for  $u_t - \Delta \phi(u) = 0$ , J. Math. Pures Appl., 58, 153-163 (1979) · [Zbl 0408.35054](#)
- [7] Crandall, M. G.; Pierre, M., Regularizing effects for  $u_t + A\phi(u) = 0$  in  $L^1$ , Journ. Funct. Anal., 45, 2, 194-212 (1983)
- [8] R. Dal Passo, Multiplicity and stability of equilibrium solutions of a one dimensional fast-diffusion problem, Boll. U.M.I., 1984 (in print). · [Zbl 0557.35070](#)
- [9] Fife, P. C., The mathematics of reacting and diffusing systems, Lecture Notes in Biomathematics, Vol. 28 (1979), Berlin-Heidelberg-New York: Springer, Berlin-Heidelberg-New York · [Zbl 0403.92004](#)
- [10] Gilding, B. G.; Peletier, L. A., Continuity of solutions of the porous media equations, Annali Scuola Norm. Sup. Pisa, Ser. IV, 8, 4, 659-675 (1981) · [Zbl 0481.35026](#)
- [11] Gurtin, M. E.; Maccamy, R. C., On the diffusion of biological populations, Math. Biosci., 33, 35-49 (1977) · [Zbl 0362.92007](#)
- [12] Lions, P. L., On the existence of positive solutions in semilinear elliptic equations, SIAM Review, 24, 4, 441-467 (1982) · [Zbl 0511.35033](#)
- [13] Okubo, A., Diffusion and ecological problems: mathematical models, Biomathematics, Vol. 10 (1980), Berlin-Heidelberg-New York: Springer, Berlin-Heidelberg-New York · [Zbl 0422.92025](#)
- [14] Peletier, L. A.; Amann, H.; Bazley, N.; Kirchgässner, K., The porous medium equation, Applications of Nonlinear Analysis

in the Physical Sciences, 229-241 (1981), London: Pitman, London

- [15] Sabinina, E. S., A class of nonlinear degenerating parabolic equations, *Sov. Math. Dokl.*, 143, 495-498 (1962) · [Zbl 0122.33503](#)
- [16] Stakgold, I.; Payne, L. E.; Stakgold, I.; Joseph, D. D.; Sattinger, D. H., *Nonlinear problems in nuclear reactor analysis, Nonlinear Problems in the Physical Sciences and Biology*, 298-307 (1973), Berlin-Heidelberg-New York: Springer, Berlin-Heidelberg-New York
- [17] Vainberg, M. M., *Variational methods for the study of nonlinear operators* (1964), San Francisco: Holden Day, San Francisco · [Zbl 0122.35501](#)

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