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Asymptotic limits for the doubly nonlinear equation. (English) Zbl 1295.35077

Adv. Differ. Equ. 19, No. 7-8, 613-634 (2014).

Summary: This article is concerned with the asymptotic limits of the solutions of the homogeneous Dirichlet problem associated to a doubly nonlinear evolution equation of the form $u_t = \Delta_p u^m + g$, in a bounded domain, as the parameters p and m tend to infinity. We will address the limits in p and m separately and in sequence, eventually completing a convergence diagram for this problem. We prove, under additional assumptions on the domain and initial data, that the equation satisfied at the limit is independent of the order in which we take the limits in p and m.

MSC:

35B40 Asymptotic behavior of solutions to PDEs
35K65 Degenerate parabolic equations
35K59 Quasilinear parabolic equations
35K20 Initial-boundary value problems for second-order parabolic equations

Keywords:

homogeneous Dirichlet problem

Full Text: Euclid