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Long-time Extinction of Solutions for Some Quasilinear Parabolic Equations

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We study the long-time behavior of generalized (energy) solutions of the Cauchy-Neuman problem for some quasilinear parabolic equations with the weight function $h(t)$ in absorption term of the following type: $u_t - \Delta u + h(t)|u|^{q-1}\,u = 0$ in $\Omega \times (0,T)$, where $0 < q < 1$, the initial function $u_0 \in L_2(\Omega)$, $\mathbb{R}^N \setminus \{\mathrm{supp}\, u_0\} \neq \emptyset$. Here h(t) is a continuous, nonnegative, nondecreasing function, such that $h(0) = 0$.

We are looking for the dependence between the long-time behavior of solutions and a degeneration degree of the absorption h(t)-potential.

The proof is based on the local energy method in the spirit of paper [1] and estimates of Saint–Venant's type in the spirit of paper [2].

[1] Y. Belaud, A. Shishkov *Journal of Differential Equations* **238**, (2007), p. 64.

[2] O. A. Oleinik, G. A. Iosif'yan *Russian Math. Surveys* **31**, (1976), p. 153.