

Benilan, Philippe; Gariepy, Ronald**Strong solutions in L^1 of degenerate parabolic equations.** (English) Zbl 0828.35050

J. Differ. Equations 119, No. 2, 473-502 (1995).

The paper deals with the degenerate parabolic problem of the form $u_t = \Delta\varphi(u) + \operatorname{div}F(u)$ on $Q = (0, T) \times \Omega$, $u(0, \cdot) = u_0$ on Ω , where $\Omega \subset \mathbb{R}^N$, $\varphi \in C^1(\mathbb{R})$, $F \in C^1(\mathbb{R})^N$, $u_0 \in L^\infty(\mathbb{R}^N)$. Assuming that $\varphi' > 0$ a.e. on \mathbb{R} and $|F'|^2 \leq \sigma\varphi'$ for some $\sigma \in C(\mathbb{R})$, the authors prove that the above problem has a strong solution u , i.e. u_t , $\Delta\varphi(u)$, $\operatorname{div}F(u)$ are functions in $L^1_{\text{loc}}(Q)$. The proof is based on the theory of BV functions in several variables and geometric measures.

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MSC:**35K10** Second-order parabolic equations**35K65** Degenerate parabolic equationsCited in **18** Documents**Keywords:***BV* functions in several variables; geometric measures**Full Text:** [DOI](#)