REGULARITY FOR ENTROPY SOLUTIONS OF PARABOLIC p-LAPLACIAN TYPE EQUATIONS

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Abstract

In this note we give some summability results for entropy solutions of the nonlinear parabolic equation $u_t - \operatorname{div} \mathbf{a}_p(x, \nabla u) = f$ in $]0, T[\times\Omega$ with initial datum in $L^1(\Omega)$ and assuming Dirichlet's boundary condition, where $\mathbf{a}_p(.,.)$ is a Carathéodory function satisfying the classical Leray-Lions hypotheses, $f \in L^1(]0, T[\times\Omega)$ and Ω is a domain in $\mathbb{R}^N$. We find spaces of type $L^r(0, T; \mathcal{M}^q(\Omega))$ containing the entropy solution and its gradient. We also include some summability results when $f = 0$ and the p-Laplacian equation is considered.