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Entropy solutions for nonlinear degenerate problems. (English) Zbl 0935.35056
Arch. Ration. Mech. Anal. 147, No. 4, 269-361 (1999).

The following problems are considered:

$$\begin{aligned} \frac{\partial g(u)}{\partial t} - \Delta b(u) + \operatorname{div}(\phi(u)) &= f && \text{in } (0, T) \times \Omega, \\ g(u) &= g_0 && \text{on } \{0\} \times \Omega, \\ b(u) &= 0 && \text{on } \{0, T\} \times \Gamma \end{aligned}$$

and

$$\begin{aligned} g(u) - \Delta b(u) + \operatorname{div}(\phi(u)) &= f && \text{in } \Omega, \\ b(u) &= 0 && \text{on } \Gamma. \end{aligned}$$

Here Ω is a bounded domain in \mathbb{R}^N with a Lipschitz boundary Γ ; $g, b : \mathbb{R} \rightarrow \mathbb{R}$ are continuous and nondecreasing with $g(0) = b(0) = 0$; $\phi \in \mathcal{C}(\mathbb{R}; \mathbb{R}^N)$, $\phi_j(0) = 0$, $1 \leq j \leq N$.

Existence of entropy solutions and comparison and uniqueness for such solutions to both problems are proved.

Reviewer: [Nickolaj A.Lar'kin \(Maringa\)](#)

MSC:

- [35J70](#) Degenerate elliptic equations
- [35K65](#) Degenerate parabolic equations
- [35A05](#) General existence and uniqueness theorems (PDE) (MSC2000)
- [35B05](#) Oscillation, zeros of solutions, mean value theorems, etc. in context of PDEs

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Keywords:

[nonlinear degenerate problems](#); [entropy solutions](#); [comparison](#); [uniqueness](#)

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